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TENDER SPECIFICATION

TENDER NO. BHEL: NR(SCT): DADRI:CNI: U-5 & 6:549

FOR

ERECTION, TESTING, COMMISSIONING, TRIAL OPERATION AND HANDING OVER OF CONTROL & INSTRUMENTATION PACKAGES FOR 2X490 MW, UNIT-5 & 6, DADRI NATIONAL CAPITAL THERMAL POWER PROJECT (NCTPP) AT DADRI, DISTT.-GAUTAM BUDH NAGAR, U. P. OF NATIONAL THERMAL POWER CORPORATION LTD.

PART I – TECHNICAL BID



**Bharat Heavy Electricals Limited
(A Govt. Of India Undertaking)
Power Sector – Northren 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 – Northren Region,
Plot No. 25 , Sector - 16A ,
Distt. Gautam Budh Nagar, NOIDA – 201 301.INDIA
Phone: 0091-0120-2515476 / 2515464 / 2515479
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Email: sku@bhelnsr.co.in / swapan@bhelnsr.co.in

TENDER NO. BHEL: NR(SCT): DADRI:CNI: U-5 & 6:549

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 works of “ERECTION, TESTING, COMMISSIONING, TRIAL OPERATION AND HANDING OVER OF CONTROL & INSTRUMENTATION PACKAGES FOR 2X490 MW, UNIT-5 & 6, DADRI NATIONAL CAPITAL THERMAL POWER PROJECT (NCTPP) AT DADRI, DISTT.-GAUTAM BUDH NAGAR, U. P. OF NATIONAL THERMAL POWER CORPORATION LTD.”

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QUALIFYING REQUIREMENTS:

“Tenderers who wish to participate should fulfill following ‘Qualifying Requirements’;

- (i) “Tenderers who wish to participate should have executed similar nature work in 60 MW Unit or higher capacity (consisting of Boiler & Steam Turbine control panels and related field instrumentation works) in Power Projects / Industrial Projects during last seven years”.
- (ii) Bidder should also have an average annual turnover of minimum of Rupees 2.00 Crores (Rupees Two Crores only) based on the audited accounts of last three financial years (2004-05, 2005-06 & 2006-07) or (2005-06, 2006-07 & 2007-08). Bidders shall submit audited balance sheets and profit & loss account in support of this
- (iii) “Bidders selection is subject to approval of BHEL’s Customer for this work i.e. M/s NTPC”.

NOTES:

- (i) The Tender Documents comprise of following;
 - a. General Conditions of Contract
 - b. Tender Notice, Project Synopsis, Special Conditions of Contract, etc.
 - c. Rate Schedule
- (ii) Tender Documents with complete details are hosted on BHEL's web page 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 19.09.2008** 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 to the undersigned (Room No. 104) at the address given above **latest by 19.09.2008** before opening of technical bids commences. Technical bids shall **be opened at 15.30 Hrs. on 19.09.2008**. 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 2,00,000/-** 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. 2,00,000/- with BHEL, PSNR, 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 this 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).**
 - a. Authorization of representative who will participate in the on line Reverse Auction Process;
 - 1. Name and Designation of official
 - 2. Postal Address (Complete)
 - 3. Telephone Nos. (Land line & Mobile both)
 - 4. FAX No.
 - 5. E-mail address
 - 6. Name of Place/State/Country, wherefrom he will participate in the RA
- (xi) Unsolicited rebate/discount shall not be accepted after bid opening.
- (xii) Bids, once submitted, shall not be returned.
- (xiii) Purchase Preference will be given to CPSUs as per Govt. Guidelines.

DGM / SCP



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TENDER NOTICE - NEWSPAPER

LAST DATE OF SALE : 19.09.2008
DATE OF OPENING : 19.09.2008

NIT NO. / NAME OF WORK
<p>TENDER NO. BHEL: NR(SCT): DADRI:CNI: U-5 & 6:549</p> <p>Sealed tenders are invited from the contractors fulfilling qualifying requirements for the works of “ERECTION, TESTING, COMMISSIONING, TRIAL OPERATION AND HANDING OVER OF C & I PACKAGES FOR 2X490 MW, UNIT-5 & 6, AT DADRI, DISTT.-GAUTAM BUDH NAGAR, U. P.</p>

NOTES:-

1. Purchase Preference will be given to CPSU as per Govt. Guidelines.
2. Please visit our website at www.bhel.com for complete details of the tender.

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

NATIONAL CAPITAL THERMAL POWER PROJECT STAGE- II **2X490 MW, NTPC DADRI**

M/S NTPC Ltd (NTPC) has awarded a contract on BHEL for design, supply, transportation, storage and material handling at site, erection and commissioning of 2 x 490 MW coal based thermal sets consisting of boilers, turbines, generators, with all the auxiliaries and accessories on a lump sum basis.

The project has 4x 210 MW thermal sets and a combined cycle gas plant consisting of 2 modules of 408.5 MW each already in operation.

On the part of BHEL it has to create its own storage, residential and office facility at site. NTPC has given the open land for development of infrastructure at site and BHEL shall have to develop it for construction of closed and open storage yard & office complex.

The project is situated in P.O. - Vidyut Nagar in District Gautam Budh Nagar in UP state. and is located about 30 Kms from Ghaziabad and is about 60 Kms from Delhi.

Section III

SPECIAL CONDITIONS OF CONTRACT

PART-A

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SECTION - III `A'

SPECIAL CONDITIONS OF CONTRACT

34.0 GENERAL

- 34.1** The intent of this specification is to provide services for execution of project according to most modern and proven techniques and codes. The omission of specific reference to any method, 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 work or portion of work awarded to him. The quoted / accepted rates / lump **sum price shall deem to be inclusive of all 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 execution. 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 affected 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 as required of all types of labour, supervisors, engineers, watch and ward, tools & tackles, calibrated inspection, measuring and test equipments as specified and otherwise required for the work, consumables for erection, testing and commissioning including material handling and PG test.
 - B** Proper out-turn as per BHEL's plan and commitment
 - C** Completion of work as per BHEL Schedule.
 - D** Good quality and accurate workmanship for proper performances of equipment.
 - E** Repair and rectification
 - F** Preservation / Re-conservation of all components during storage / erection till handing over. *All assistance during PG test.*
 - G** **House Keeping:** The contractor is supposed to carryout hose keeping of work area on regular basis to keep the work place neat and tidy and available for the safe working. The scrap generated during execution activities is to be dumped at designated area as decided by BHEL/ its

customer. Compliance report on above shall be submitted by the contractor to BHEL on daily basis. In case the contractor fails to do so, BHEL shall get the same done at the risk and cost of the contractor. The cost with applicable BHEL overheads shall be recovered from the monthly bills of the contractor.

34.5 Health, Safety & Environment management (HSE)

BHEL-Power Sector (NR) is ISO 9001-2000, ISO 14001-1996, OHSAS 18001-1999, ISO 27001 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.

The contractor shall also comply with applicable legislation and regulations with regards to Health, Safety and Environmental aspects for minimizing risk arising from occupational health & safety hazards, controlling pollution and wastage. 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 (Safe Work Practices).

34.5.1 Besides provision with regard to SAFETY under Clause 27 of GCC, the contractor will be responsible for Health, Safety & Environment management at site for the construction activities to be carried out by them in accordance with requirements given under section I(a) of GCC of this document. The contractor shall continuously take special care to ensure the safety and prevention of human and equipment accidents and maintain good sanitary conditions in and around the site. All the construction work and plant operation must be carried out in the safest possible manner. The Engineer reserves the right to stop any process which, in the Engineer's opinion, is being performed dangerously. In this case the contractor must adhere immediately the requisite safety precautions and any delays attributed to the work stoppage on this account shall not affect the agreed contractual finishing dates.

The contractor shall appoint dedicated full-time Qualified Safety Officers who shall have full authority to ensure that all necessary safety precautions are observed by the Contractor's employees and sub-contractors. These appointees shall have full responsibility for the safety of all personnel within the contractor's area of the works.

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

- 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.
- Do not walk on pipelines or false ceiling.
- Maintain good Housekeeping at work site.
- No photography/ Videography allowed without permission
- All Site supervisors & engineers (including subcontractors) 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 working hours and exigent hours (holidays/ night shift).
- Site Safety training to be imparted to all workers & plan to be made to cover every worker.
- Tools box 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.
- 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 adequate no. of Safety Supervisors (as acceptable to BHEL/NTPC).
- 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.

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.

34.5.3 Contractor shall ensure following:

34.5.3.1 Contractor has to maintain contact with local hospital having scanning & other ultra modern medical facilities including ambulance required during emergency.

34.5.3.2 Contractor has to ensure pre employment medical check for all staff & workers.

34.5.3.3 Contractor has to ensure that adequate First Aid facilities with trained male nurse are available at work site for emergency purpose. This emergency set-up should include, but not limited to, the following

- a) Male nurse (in shifts)
- b) Oxygen set up
- c) Breathing apparatus
- d) Eye wash facility
- e) Stretcher
- f) Trauma blanket
- g) Medicines.

In addition to above, BHEL (through its other contractor) has arranged ambulance at work site for emergency purpose, which can be utilized by contractor in case of emergency. In case , under unavoidable circumstances , if the ambulance is not available , the contractor will have to arrange for the same as [under clause 34.5.3.1](#)

34.5.4 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.

34.5.5 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 PRELIMINARY WORKS

35.1 The contractor shall, as a first field activity check the foundations for Control Panels, erection of miscellaneous equipments / Instruments etc. as mentioned in for Instrumentation package for the correctness of the same as per the drawings and satisfy himself in all aspects. He should ensure location of foundations, their consolidation, absence of voids, levels, correctness of boltholes, pockets levels and centerlines etc. All measurements should be recorded and submitted to Engineer for approval before erection.

35.2 Before starting erection job, contractor shall ensure that the area where erection action activity to be started is sufficiently enclosed against ingress of dust and water, and all debris have been cleared off from the floor to a designated area as per instruction of Engineer. The contractor shall arrange to get the working area and surroundings cleaned daily to ensure a dust free atmosphere for working.

Contractor shall first cover all openings on operating floor and put temporary hand railings on all sides of the floor to avoid any accident to the personal working. Material for above work, if available can be issued by BHEL on returnable basis.

35.3 The contractor shall provide his tool stores for special tools and instruments at a convenient location near to the place of working. Necessary area shall be provided to contractor by BHEL. This is to be cleared after completion of the work. If so required he will have shift the same if required giving fronts to other agencies engaged at site.

35.4 The accuracy of all equipment / instruments and their functioning shall be established before they are permitted for use on the job. If the Engineer doubts the accuracy of the precision tools, any time during erection, the contractor shall arrange the checking / calibration of tools / equipment/ instruments at his cost

36.0 CIVIL WORKS, FOUNDATIONS AND GROUTING.

36.1 NTPC/BHEL shall provide all equipment foundations. For the correctness of these foundations as per drawings, the contractor shall check the dimensions & locations of the foundations, pockets, anchor-bolt pitch. Further, top elevation of foundations shall be checked with respect to benchmark. All minor adjustments of foundation level, dressing and chipping of foundation surfaces up to 50 mm, enlarging the pockets in

foundations etc., as may be required for the erection of equipment / plants shall be carried out by the contractor.

- 36.2** While on the job, care is essential to avoid too much chipping and resultant lowering of level. In case of excess chipping, contractor has to arrange additional packing plates as per requirements provided BHEL Engineer allows it. When required by manufacturers, the embedded sub-sole plates shall be scraped and checked with prussian blue to get the required contact with frames.
- 36.3** The contractor shall ensure perfect matching of packer plates including machining, scraping and blue matching with foundation by dressing the foundation, as well as perfect matching between the packer plates and the base plate of equipment to the satisfaction of BHEL Engineer. If required the packer plates may have to aligned and fixed on the foundations using special high strength, non-shrinking and quick-setting grouts. The minimum thickness below the packer plate should be 20 mm. The material required for this has to be arranged for by the contractor at his cost.
- 36.4** Grouting of structures, equipments, including anchor / foundation bolts, beneath base, base hollows etc. as may be applicable, is included in the scope of contractor. Arranging all labour, building materials including cement, ordinary Portland as well as quick setting – free flow – non-shrink grout mix (e.g.srinkcomp, conbextra etc), form work, shuttering, and any other requirements is in the contractor's scope. Contractor shall obtain approval of BHEL for cement (ordinary as well as quick setting – free flow – non-shrink grout mix) prior to use. Cleaning of foundation surfaces, pocket holes and anchor bolt pits and de-watering and making them free of oil, grease, sand and other foreign materials by soda washing, water washing, compressed air and other approved methods, are within the scope of this specification / work.
- After the grouting has finally set and cured, alignment of equipments involved shall be checked again to verify for any disturbance or any other reason. If required, de-coupling of equipments has to be done for conducting the verification. In case any disturbance is noticed the cause, if any, shall be removed and re-alignment done as part of work.
- 36.5** The contractor has to arrange for all materials required for carrying out the grouting including supply of the Special Grout if required as indicated in the drawings and as approved by the Engineer. **The contractor will be required to supply and apply actual quantity as per the site requirement without any extra cost.** The contractor shall satisfy BHEL of the quality & quantity of cement ready mix grout (Conbextra GP II or its equivalent) material brought by him for use in the works.
- 36.6** The contractor shall check and verify the alignment of equipment, alignment of shafts of rotating machinery, the slopes of all bearing pedestals, centering of rotors with respect to their sealing bores, couplings etc. as applicable and the like items to ensure that no displacement had taken place during grouting. The values recorded prior to grouting

shall be used during post grouting check up and verifications. Such pre and post grout records of alignment details shall be maintained by the contractor in a manner acceptable to the Engineer.

37.0 CONSUMABLES

- 37.1 The contractor shall provide within finally accepted rates, all consumables like, gland packing, all welding electrodes (including alloy steel, Aluminum, stainless steel), Aluminum filler wires, tig wires, all inert / welding gases, soldering material, dye penetrants, other erection consumables such as tapes, jointing compound, grease, mobile oil, M-seal, Araldite, Parmali wood, petrol, CTC / other cleaning agents, petroleum jelly, insulation tape, PVC sealing compound, sleeves, cable ties, gaskets and shims, wooden sleepers, steel required for temporary works such as supports, packing hardware items, paints, sealing compound required for completion of work except those which are specifically supplied by manufacturing unit.
- 37.2 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.
- 37.3 It shall be the responsibility of the contractor to obtain prior approval of BHEL / NTPC, 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.
- 37.4 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.
- 37.5 Storage of all consumables including welding electrodes shall be done as per requirement / instruction of the Engineer by the contractor at his cost.
- 37.6 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.

- 37.7 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.
- 37.8 Transportation of Oil Drums from stores, centrifuging and first filling of Oil, subsequent topping / makeup till the unit is commissioned and handed over to the customer is included in the scope of this contract. The contractor shall have to return all the empty drums to BHEL / BHEL client's store at no extra cost. Any damage / loss of above drums shall be to the contractor's account.
- 37.9 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.
- 37.10 **Supply of copper tinned lugs of various types (pin, ring, fork, snap-on) upto 4 sq.mm, PVC cable ties, PVC ferrules, PVC button and tapes, cable identification tag of PVC/metallic, clamping and dressing material with hardware, PVC sleeves etc. shall be supplied by the contractor within the quoted rates for cable laying. The quality of material shall be got approved from BHEL engineer prior to their use on job.**
- However, if any of above material is supplied with the main supplies shall be provided to contractor free of charge for erection. Contractor shall take care of above while bidding for the work.**

38.0 TOOLS AND PLANTS / IMTE's

- 38.1 Essential T&P and IMTEs being provided by BHEL in urgency to sub-contractor free of hire charges shall be shared by other subcontractors working for BHEL at site and the allotment done by BHEL Engineer shall be final and binding.
- 38.2 Besides the T&Ps and IMTEs being made available to contractor, free of hire charges by BHEL as per annex-I, **All the T&Ps and IMTEs required for successful and timely execution of the work covered within the scope of this tender, shall be arranged and provided by the contractor.** He should ensure that these are in good in working condition. 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 with overheads as applicable shall be deducted from contractor's bill. Decision of BHEL in this regard shall be final and binding on contractor.

(Operator for some cranes if provided by BHEL and issued to contractor for work free of hire charges- one helper, fuel and other consumables shall be provided by the contractor within the finally accepted prices).

- 38.3** All distribution boards, connecting cables, wire ropes, hoses, pipes etc, including temporary air / water / electrical connections etc shall have to be arranged by the contractor at his own cost.
- 38.4** 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.
- 38.5** The operation of all BHEL's T&P being provided free of hire charges shall be in the scope of the contractor. The contractor shall arrange, at his own cost, trained operators, fuel and other consumables for their operation. All lubricants shall be provided by BHEL free of cost. The contractor will give the requirement well in advance.
- 38.6** The contractor shall engage trained and experienced operators for the operation of NTPC/BHEL's T&Ps. Their skill / performance will be checked by BHEL Engineer before they are allowed to operate the same. However checking of skills by BHEL does not absolve the contractor of his responsibilities for proper and safe handling of equipment, consistent good performance of operators and regular performance evaluation of operators.
- 38.7** The day to day and routine maintenance of BHEL's T&Ps should be carried out by contractor as per manufacturers / BHEL's maintenance schedule at his cost. These shall be maintained in good working condition during the entire period of use. T&Ps in defective / damaged condition shall be rectified promptly to the full satisfaction of BHEL engineer. Contractor shall maintain records for maintenance of major T&Ps that shall be made available for inspection whenever required. In case of any lapses on the part of the contractor BHEL at its own discretion get the servicing / repair of equipment done at the risk and cost of the contractor with BHEL overheads.
- 38.8** The contractor shall arrange at his cost all spares needed for upkeep of all T&Ps other than cranes and Hydraulic Test pumps supplied by BHEL. For cranes, repair / replacement of filter, batteries, self, dynamo, shall be the responsibility of the contractor. However, the charges of the replacement of the other damaged / worn out parts of BHEL cranes will be borne by BHEL, provided the damage is not due to the negligence of the contractor. However, if there are breakdowns / damages due to negligence of the contractor, the complete service / repair charges and cost of all the spares damaged with BHEL overheads shall be to the account of contractor and shall be recovered from his RA bills.

- 38.9** All supervision and labour required for maintenance and attending breakdowns shall be arranged by the contractor at his own cost. Specialist supervision shall be arranged by BHEL as assessed by BHEL Engineer.
- 38.10** Increasing / shortening of the crane boom to suit work requirements shall have to be arranged by the indenting contractor at his cost. All necessary manpower tools, support, consumables, illumination etc. will have to be arranged by contractor at his cost.
- 38.11** The area and infrastructure development of the area to be carried out by the customer. However in construction projects of this magnitude it is possible that all the areas / approaches may not be ready.
In such cases 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. No compensation on this account shall be payable.
- 38.12** In the event of contractor not using and maintaining BHEL T&Ps according to BHEL's instructions. BHEL will have the right to withdraw such item without any notice and no claim in this regard shall be entertained and contractor shall be responsible for delay in execution on this account.
- 38.13** The contractor shall furnish regular utilization report of the BHEL T&Ps, as per requirement of BHEL.
- 38.14** Any loss / damage to any part of BHEL T&Ps and IMTEs shall be to the contractor's account and any expenditure on these accounts by BHEL will be recovered from the contractor's bill in case the contractor fails to make good the loss.
- 38.15** It shall be responsibility of the contractor to take delivery of T&Ps from stores or place of use by other contractor at project site, transport the same to site and return the same to BHEL store / place as intimated by Engineer in project site in good working conditions after use.
- 38.16** The contractor shall return BHEL T&Ps and IMTEs issued to him in good working condition as and when desired by BHEL (on completion or reduction of workload). If contractor delays return of T&P and IMTE, hire charges as applicable shall be levied by BHEL from time, it was requisitioned till the time of actual return. *Hire charges shall also be charged on the T&Ps and IMTEs returned in damaged / unserviceable condition to BHEL till their satisfactory repair.* T&Ps & IMTEs returned in damaged / unserviceable condition shall be got repaired by BHEL at its own discretion and entire cost of repair with BHEL overheads shall be recovered from the contractor.
- 38.17** Replacement cost including BHEL overheads in respect of irreparable / completely damaged / non return of T&Ps and IMTEs shall be recovered from the contractor's running / final bills
- 38.18** deleted
- 38.19** Contractor shall ensure deployment of reliable and calibrated IMTEs (Inspection, Measuring and Test Equipment). The IMTEs shall have test/ calibration certificates from authorized/ Govt. approved / accredited agencies traceable to National /

International standards. Each IMTE shall have a label indicating calibration status i.e. date of calibration, calibration agency and due date for calibration. A list of such instruments deployed by contractor at site with its calibration status is to be submitted to BHEL Engineer for control.

- 38.20** Retesting / re-calibration shall also be arranged at regular intervals during the period of use as advised by BHEL Engineer within the contract price. The contractor will also have alternate arrangements for such IMTE so that work does not suffer when the particular instrument is sent for calibration. Also if any IMTEs not found fit for use, BHEL shall have the right to stop the use of such item and instruct the contractor to deploy proper item and recall i.e. repeat the readings taken by that instrument, failing which BHEL may deploy IMTEs and retake the readings at contractor's cost.
- 38.21** 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 BHEL Engineer .
- 38.22** 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&Ps, 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.
- 38.23** Regular utilisation report of the BHEL T&Ps and IMTEs as per requirement of BHEL shall be furnished by the contractor.

39.0 SUPERVISORY STAFF AND WORKMEN

- 39.1** The contractor shall deploy all the skilled workmen like **fitters, welders, crane-operators, drivers, gas cutters, welders, riggers, sarangs, masons, carpenters, electricians, helpers and instrument technicians** to carry out the works as per specifications. In addition to skilled, semi-skilled and unskilled workmen required for all the works, suitable workmen required for handling and transporting of equipment from site storage to erection site, erection, testing and commissioning as contemplated under this specification shall be deployed. 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 insist on removal of any employee / workman of the contractor at any time, if they find him unsuitable. The contractor shall remove him forthwith.

- 39.2** The adequate supervisory staff, including qualified Engineers, shall be deployed by the contractor to 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.

All Supervisors/ Engineers shall have to be supported individually by all independent groups comprising of workers like electrician, technicians and helpers etc. and required T & P and IMTE's.

- 39.3** The work shall be executed under the usual conditions affecting major power plant construction and in conjunction with numerous other operations / activities at site. The contractor and his personnel shall cooperate with other personnel / contractors, coordinating his work with others and proceed in a manner that shall not delay or hinder the progress of work as a whole.
- 39.4** 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 conforms to the dimensions and tolerances given in the drawings / documents / instructions given by BHEL Engineer from time to time.
- 39.5** The contractor shall deploy the necessary number of qualified and approved full time electricians at his cost to maintain his temporary electrical installation and miscellaneous commissioning jobs till the completion of work as specified by BHEL engineer.
- 39.6 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.
- 39.7 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, thereby.
- 39.8 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.
- 39.9** 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.

- 39.10** Though every endeavor shall be made to ensure that all plant materials are supplied as per schedule. However in a job of this kind it is possible that some materials may be delayed. In order to achieve the ultimate targets, the contractor may have to augment his manpower and resources. No compensation on this account shall be admissible.
- 39.11** 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.

40.0 MATERIAL HANDLING AND STORAGE

- 40.1** All the equipment furnished under this contract shall be received from the project stores, sheds / storage yards and transported to pre assembly area / erection site and stored in the storage spaces in a manner so that they are easily retrievable till the contractor erects them. While drawing / lifting material from BHEL / customer stores, contractor shall ensure that the balance / other materials are stacked back immediately.
- 40.2** While BHEL will endeavor to store / stack / identify materials properly in their open / close / semi closed / tarpaulins covered storage yard / shed, it shall be contractor's responsibility to assist BHEL in identifying materials well in time for erection. They should take the 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.
- 40.3** The contractor shall take delivery of components, equipment / consumables from storage area after getting the approval of BHEL Engineer on standard indent forms.
- 40.4** The contractor shall identify and deploy necessary Engineers / supervisors / workmen for the above work in sufficient number as may be needed by BHEL, for C&I works covering their scope.
- 40.5** All the equipment shall be handled very carefully to prevent any damage or loss. No untested wire ropes, slings, lifting equipment, d-shackles, dog-clamps, eyebolts 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.
- 40.6** 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 safe guard the equipment against any damage. Dragging of piping / valves should be avoided. In case of any damage the cost shall be covered from the contractor.

- 40.7** 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.
- 40.8** Contractor shall be responsible for examining all the plant and materials 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 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 number of watch / ward personal to avoid any pilferage of material. As per General Conditions of contract under provisions of clause No 29 BHEL will reserve the right to recover the cost of repair / replacement, if any, to bring back the equipment in original order, in case the equipment / material is lost / damaged while in the custody of the contractor. BHEL's decision in this regard shall be final and binding on the contractor.
- 40.9** 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.
- 40.10** 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.
- 40.11** 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.
- 40.12** 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.
- 40.13** The contractor shall ensure that all surplus / damaged / scrap / 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.
- 40.14** The contractor shall hand over all parts / materials remaining extra over the normal requirement with proper identification tags to the stores as directed by the concerned BHEL engineer.

- 40.15 The contractor shall ensure that all the packing materials and protective devices installed on equipment during transit and storage are removed before installation.
- 40.16 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
- 40.17 All Control 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.
- 40.18 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.

40.19 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.

40.20 The contractor shall thoroughly clean all the components before installation / erection.

41.0 PRESERVATION OF COMPONENTS

41.1 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.

- Items stored outdoors shall be stored in such a way that item is at least six inches (6") above the ground
- 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.

41.2 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.

41.3 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.

41.4 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.

42.0 WELDING and NDT

42.1 The method of welding (**ARC, Gas, TIG, MIG** 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.

42.2 All welders including tack welder, structural and busduct welder shall be tested and approved by BHEL Engineer / Customer 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

42.3 Faulty welds shall be cut and re-welded at the contractor's 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

42.4 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.

42.5 Only BHEL/NTPC 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.

- 42.6** 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 passed qualification tests does not absolve the contractor of contractual obligation to continuously check the welder's performance.
- 42.7 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.
- 42.8 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.
- 42.9 Non-destructive testing is 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

43.0 PROGRESS REPORTING

- 43.1** Contractor is required to draw mutually agreed monthly erection program in consultation with BHEL well in advance. Contractor shall ensure achievement of the program. He shall also timely arrange for additional resources considered necessary for the same at no extra cost to BHEL
- 43.2** Weekly progress review meetings will be held at site during which actual progress during the week vis-à-vis scheduled program shall be discussed for actions to be taken for achieving targets. Contractor during discussions shall also present the program for subsequent week. The contractor shall constantly update/revise his work program 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.
- 43.3** The contractor shall submit daily, weekly and monthly progress reports, manpower reports, materials reports, consumables (gases / electrodes) report and other reports as per performa considered necessary by the Engineer.
- 43.4** 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 program and the slippage does not accumulate and affect the overall program.

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

44.0 DRAWING AND DOCUMENTS

- 44.1 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.
- 44.2 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.
- 44.3 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.
- 44.4 **The data furnished in various annexure 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.**
- 44.5 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.
- 44.6 Deviation from design dimensions should not exceed permissible limit. The contractor shall not correct or alter any dimension / details, without specific approval of BHEL.

45.0 INCOME TAX , SERVICE TAX AND SALES TAX ETC

- 45.1 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.

- 45.2 **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.

- 45.3 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.
- 45.4 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.
- 45.5 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.

46.0 EXTRA WORK:

- 46.1 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.
- 46.2 The rates indicated as above, shall include over time, if any, consumables, supervision, use of tools and tackles and other site expenses and incidentals.
- 46.3 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.

47.0 PRICE VARIATION

47.1 The finally accepted rates for scope of work as defined in this tender are subjected to price variation provisions as per following formula:

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

P1 = Increase/decrease in billing amount (variation) for the particular month of billing.

P0 = Gross billed amount for the month as per contract provisions.

F1 = All India CPI published by Labour bureau, Simla, Govt. of India, for Industrial workers (Base 2001 =100) applicable for the month under consideration i.e. for which bill has been raised.

F0 = All India CPI published by Labour bureau, Simla, Govt. of India, for Industrial workers (Base 2001 =100) **applicable for the month of opening of technical bid.**

47.2 The contractor will be required to raise the bills for price variation payments on a monthly basis irrespective of the facts whether any increase or decrease in CPI. Price variation as per above formula will be calculated and paid/deducted on the total contract value (excluding payments towards extra works and over run, if any) on month-to-month basis from the date of award. BHEL however reserves the right to freeze variation for that much of duration of delays, from time to time, which are entirely attributable to the contractor. **Average of applicable price indexes paid shall be taken as index for PVC for final 4% amount.**

47.3 With the provision of price variation as above NO CLAIM / COMPENSATION on account of any increase whatsoever, (irrespective of whether variation are steep / unanticipated or not compensated by the above escalation provisions in full towards minimum wages, consumables, electrodes, gases or any other item / reason) will be payable during the entire period of execution including extended period, if any.

48.0 RATE SCHEDULE

48.1 **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/prices.**

48.2 **The tenderer shall quote the rates 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.

- 48.3** 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. However, in case of over all variation in Contract value (w.r.t the awarded value indicted in the LOI), beyond (minus) 30%, the contractor will be eligible for compensation as per the following provision:

“The total executed value shall be raised by 10 % subject to the condition that the total value of work executed plus increase as above shall be limited to 70 % of the awarded contract value”

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.

49.0 INSTRUCTIONS TO TENDERER

- 49.1** Offers received without data / information required to be submitted under tender clauses-11.1 to 11.11 (as per GCC_ Financial Status) are liable to be rejected. All these data / information should be duly supported by documentary evidences (Refer note below clause-11)
- 49.2** No deviations to the tender conditions will normally be accepted.
- 49.3** The tenderer is 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-familiarization 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.
- 49.4** The contractor in the event of this work awarded to him, shall establish a site office at site and keep posted an authorized 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 authorized 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.
- 49.5** Offers of Tenderers with unsatisfactory past performance in any of the BHEL's Power Sector Regions will be rejected

50.0 LIQUIDATED DAMAGES (LD)

For delay in completion of work attributable to the contractor, the LD shall be applicable at the rate of ½% of the contract value per week of delay or part thereof limited to a ceiling of 10% of the contract value as mentioned under clause no.25.5 of the GCC of the tender.

51.0 SECURITY DEPOSIT

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 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.

52.0 INSURANCE

- 52.1 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.
- 52.2 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.
- 52.3 The Contractor shall provide insurance cover to all persons employed/engaged by him throughout the period of Contract, including the extended period, if any.
- 52.4 In addition to insurance as per Workman Compensation act. Employer's liability and also Group Personal Insurance for employees are also to be taken by contractor.

53.0 OTHERS

- 53.1 In case of any contradiction between General Conditions of Contract (GCC) and Special Conditions of Contract (SCC), the latter shall prevail.
- 53.2 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.

- 53.3** For reverse auction/ for Price Bid opening, only those bidders will be considered who will be qualified for the subject job on the basis of pre-qualification evaluation / Techno-commercial bids. 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.

**SECTION-III
SPECIAL CONDITIONS OF CONTRACT**

PART-B

Cl. No.	Description
54.	Scope of work
55.	Erection
56.	Testing, Pre-Commissioning, commissioning and post- commissioning
57.	Finish painting
58.	Facilities to be provided by BHEL/Contractor
59.	Time schedule
60.	Over run
61.	Terms of payment

SECTION-III 'B'
SPECIAL CONDITIONS OF CONTRACT

(PART-B)

54.0 SCOPE OF WORK

54.1 BHEL has been awarded the work of Design, Manufacture, supply, installation, erection & commissioning of BTG package of 2x490 MW Unit- 5 & 6 at DADRI NCTPP, Dadri by NTPC. The equipment consists of Boiler, Electro-static precipitator, Fans, milling systems, Steam Turbines, Generators; Boiler feed pumps, Condensate extraction pumps, piping and VFD systems including transformers along with the associated auxiliary supports and controls.

Scope of these specifications cover complete work of handling, transportation of materials from Project storage yard / stores to erection site / place of erection, storage at erection site, preservation, watch and ward, dressing, chipping and leveling of foundations, cleaning, checking, testing, pre-assembly, erection, calibration, alignment, grouting, welding, NDT wherever required, preservative/ touch-up painting including supply of paints etc, Earthing of equipment, including other activities required for erection, testing, commissioning, post commissioning, trial operations & handing over of CONTROL & INSTRUMENTATION equipments and associated items indicated in the rate schedule briefly covered within the scope of these specifications for 2*490 MW, UNIT 5 & 6 Dadri National Capital Thermal Power Project (NCTPP) At Dadri, Distt.-Gautam Budh Nagar, U. P. Of National Thermal Power Corporation Ltd.

54.2 *The quantities mentioned in the rate schedule are tentative and may vary as per the actual engineering / requirement to complete the package for C & I work. Some of the items may be added or deleted which shall have to be executed by the contractor within his scope of work and shall be paid as per the rates awarded in the contract. The contractor shall have to erect, test and commission entire material listed in the rate schedule. The decision of BHEL in this regard shall be final and binding on the contractor.*

54.3 The rates for the additional items may be considered on the rates of similar category of items in the rate schedule as approved by BHEL.

54.4 The scope of work shall also include the following within the quoted item rates:

- Re-rolling of cables on drums as required by site engineer.
- Obtaining provisional and final approvals from Electricity Authorities.

54.5 The scope of work also covers all performance tests necessary to ensure that workmanship confirms to relevant standards and that such tests are adequate to demonstrate that the installations complies with the requirements of this specification. All arrangements for conducting tests are to be made by contractor within their quoted rates and tests may have to be repeated to satisfy BHEL / NTPC Ltd.

- 54.6 The scope of work will also include providing **free of cost services of Six qualified and experienced Diploma / degree Electrical / Instrumentation Engineer** having experience in respective field entirely for the commissioning activities and for direct supervision of various works of power plant as suggested by BHEL from second month of mobilisation. The qualification and experience of the Engineers shall be acceptable to the Construction Manager/ BHEL, DADRI site. These qualified Engineers shall be provided for Seventy Two **(72) man-months** as per site conditions. These Engineers shall be reporting directly to the BHEL Engineer for the main work. They shall be deployed in all areas covered under various specifications as well as other related areas as may be deemed essential based upon work requirements, though not specified. They shall be guided by BHEL Engineers to ensure smooth work progress as and when /where required /deployed. No separate payment shall be paid for providing the services as per this clause. The contractor shall provide these free of cost services within the quoted rates.

Note: - In case contractor fails to provide above-mentioned manpower as desired by BHEL, the latter shall have the right to hire such services from other agencies at the risk and cost of the contractor. However, if BHEL does not utilize the man months as per above provision, fully or partly a lump sum of Rs 10,000/- (rupees ten thousands only) per man month for the un-utilised man months will be recovered from the bills of the contractor.

- 54.7 The contractor under this contract shall also provide **free of cost services of skilled persons for a total period of 58 Man-months** exclusively for use by BHEL. This manpower will be required for following services:

- Qualified computer operators (minimum 'O' level qualified) capable of operating the material management software package / other packages available at site or for office work for total 18 man months,
- Unskilled workers for working in store, colony & office for a total 40 man months.

Persons so deployed shall have to work in extended hours whenever required. Workmen provided as per the above provisions shall be fully trained and experienced in the nature of work for which they are deployed.

In case contractor fails to provide above-mentioned manpower as desired by BHEL, the latter shall have the right to hire such services from other agencies at the risk and cost of the contractor. However, if BHEL does not utilize the man months as per above provision, fully or partly, recovery at the rate of the prevailing minimum wages at Dadri for the categories given plus 10% will be made from the final bill of the contractor.

- 54.8 The Scope of work under this tender for 2X490MW Unit- 5 & 6 CNI package: - The brief description of major equipment/ items to be erected, tested and commissioning under the scope of subject work is as described below. However, change in design/specification may occur as usual in such large volume of work for which no

compensation will be payable. Contractor shall complete the entire work as detailed in tender specification within the contractual rates. **Removing & reconnection of equipment will be the part of scope at no extra cost to BHEL.**

Erection, Testing & Commissioning, Handing over of Control & Instrumentation scope of work as per schematics, drawings , manuals and as detailed below in brief:-

INSTRUMENTATION SCOPE

(A) Misc. Panels –Distribution / Starter Panels Etc.

(B) Cabinets and Misc. Electrical Equipment (MCCs, JBs, Welding Sockets, Local PBs Etc.)

(C) Control & Protection Relay Panels, Excitation System etc. –DAVR Panels

(D) Panels – SG / TG panels for Control, Monitoring & information system based on BHEL make maxDNA system for:

a) Steam Generator Control comprising of: Electronic System Cabinets catering to:

- Burner management System
- Master Fuel Trip, Unit Purge & Protection
- Coal & Oil Elevations Interlocks & Protection
- Secondary Air Damper Controls
- Soot Blower Controls
- Auxiliary Pressure Reducing & De-superheating, HPBP
- Fuel OIL Pumping & heating Controls, Bowl Mill Lube Oil Control
- HFO/LFO Pressure & Atomising Control
- SBC Drain Pressure/Temp. Control

b) Steam Turbine Controls comprising of: Electronic System Cabinets catering to:

- Electro-Hydraulic Turbine Controls (EHTC)
- Automatic Turbine Run-up System(ATRS)
- Gland Steam Pressure Controls (GSPC)
- Turbine Stress Controller (TSC)
- Automatic Turbine Tester(ATT)
- Turbine Protection (TP)
- LP bypass
- Generator Auxiliaries Monitoring Panel (GAMP)

(E) Vibration monitoring System with Sensors & Monitors for TG Services:

Absolute Bearing Vibration, Relative Shaft Vibration, Differential Expansion of Rotor & Casing, Casing Expansion, Speed.

(F) Field Instruments for Soot Blower_Steam Pressure and temp. Control, SADC, FOPH, APRDS and HPBP.

(G) Man Machine Interface & Plant Information System comprising of:

- Operator Workstation, LVS Workstations
- Engineering Workstation, maxlink Station
- Historical Storage & retrieval station
- Computers / PLC based Equipments
- Inkjet / Laser / Dot-matrix printers
- Operator Workstations for FOPH panel in Pump house
- Ethernet Switches

(H) Cabling: - The Cabling system consists of Cable Tray installation, Cable laying, termination, dressing, ferruling, tagging etc.

- Instrumentation Cables between ST on-base instruments and Field JBs, JBs to panels etc.
- MaxNET UTP & Optical Fiber cables
- LT Power Cables /LT Control Cables /Signal Cables /Screened Cables etc.
- Various types of Cable Trays

(I) DC System-

- 24V DC Power Supply with Battery, Battery charger catering to SG/TG maxDNA panels
- 24V DC mini Power Supply with Battery, Battery charger system for FOPH Panel in Pump House
- Mini UPS System in Pump House

(J) VFD Systems for ID Fan Control consists of Power Converter Transformers, Pulse Power Control Panels, DC Link Reactors, AC VCB / Contactor etc.

(K) Condenser Instruments & Fittings-

Hot well gauge glass, Level switches, Temperature gauges at CW inlet & outlet, Root valves for Level switches etc.

(L) Instrumentation for Seal Oil System, Gas System with Refrigeration Gas Drier

(M) Instrumentation for Coal Mill Reject Handling system, as required.

(N) Erection of miscellaneous Material

- JBs / CJBs
- Clamps
- Mounting Frames
- Power cylinders
- Rigid Pipe / Conduits
- Pneumatic Tubes (Copper/ SS Tubing)
- Impulse line(CS/SS)

(O) Instruments (Transmitters / Gauges / Switches / Temperature Sensing Elements like RTDs & Thermocouples

(P) Detectors /Vibration, Speed & Other Turbovisory Pick Ups

(Q) Sample Handling System / Analyzer System / Electronic Water Level Indicator System

(R) Control Valves Calibration

(S) VFD Transformers

54.9 **Contractor shall erect, test, commission all the equipment, cabinets, panels, instruments etc. as per sequence prescribed by BHEL Engineer at site.** The sequence of erection / commissioning methodology will be decided by the BHEL Engineer depending upon the availability of materials / work fronts etc. No claim for extra payment from the contractor will be entertained on the grounds of deviation from the methods of erection / commissioning adopted in erection / commissioning of similar jobs elsewhere or for any reasons whatsoever.

54.10 The customer M/s NTPC may depute their representative for checking and supervision of important stages of work. The contractor shall be required to provide all facilities for inspection of works, without any cost implications to the Engineer. Any defect in quality of work or deviations from drawings / specifications pointed out during such inspection shall be made good by the contractor in the same way if pointed out by the Engineer, without any cost implication to BHEL.

54.11 Contractor shall plan and transport equipment / components from storage yard sheds to erection site and erect them in such a manner and in a sequence that material accumulation at site should not lead to congestion. Contractor shall plan activities considering plying of his vehicles on ring road also. Materials shall be stacked neatly, preserved and stored in the contractor's shed and work areas in an orderly manner. If required, the contractor shall arrange shifting of surplus material expeditiously failing which the same will be arranged by BHEL at contractor's risk and cost.

55.0 ERECTION

55.1 The following provisions cover the technical requirements for some of equipment installation. The brief idea about the work involved is indicated below however the work is to be carried out in accordance with the recommendations of the equipment manufacturer drawings, documents furnished to the contractor by BHEL or as directed by BHEL Engineer.

All normal erection and assembly techniques necessary for completion of works under this specification and magnitude have to be carried out. It is not possible to specifically list out all of them. Absence of any specific reference will not absolve the contractor of his responsibility for the particular operation.

55.2 All works such as cleaning, checking, leveling, aligning, assembling, temporary erection for alignment, dismantling of certain equipment for checking, cleaning, surface preparation, fabrication at site, cutting, grinding, straightening, blue matching, chamfering, filing, chipping, drilling, machining, surface grinding, shaping, fitting up etc. as may be applicable in such erection works are to be

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

- 55.3 Any fixtures, scaffolding materials, concrete block supports, steel structures required for temporary supporting, for pre-assembly or checking, welding, lifting and handling during pre-assembly and erection shall be arranged by contractor at his cost.
- 55.4 Any cutting of masonry work, which is necessary shall be done by the contractor at his own cost and shall be made good to match the original work. The Contractor shall obtain prior approval before cutting any masonry / concrete work.
- 55.5 Conduits shall be thoroughly cleaned before pulling in the cable.
- 55.6 Dimension and weight as mentioned against control panels, MCCs, etc. in the BOQ cum rate schedule are only approximate and there may be changes in dimension and weight in actual supply of the equipment and no rate variation shall be applicable on this account.
Wherever brief description of the system is given under various sub-heads, it is only for the understanding system requirements. It does not indicate the total specification of work. For such system, other clauses are also applicable wherein work details are specified.
- 55.7 The contractor should note that after execution of work they will hand over marked up drawings "as erected" drawings to BHEL Engineer at site for preparation of "as built" drawings. *"As erected" drawings will bear the signature of BHEL Engineer and contractor.*
- 55.8 Calibration log-sheets (if require, history cards) of all the instruments, panels, drives, relay testing etc. under the scope shall be recorded and submitted on BHEL approved formats. *Proper logging will form a part of calibration / erection activity for the purpose of monthly running bills payments.*
- 55.9 The contractor shall use only SHEARING machine or HACKSAW for cutting angles, flats, channels and trays. No gas cutting is permitted. Drill machine shall be used for drilling holes.
- 55.10 **The contractor shall paint the name / put tag numbers on all the equipment / instruments / cables etc. erected by him. Materials for tagging shall be supplied by the contractor. Contractor at his cost shall also arrange the adhesive etc.**
- 55.11 Contractor shall fabricate and erect stands / supports for Junction boxes, push button stations, fixing of push button and plugging of holes in JB's. This is considered inclusive in the item erection. The hardware / material shall be supplied by BHEL. The fabrication forms part of erection work.

- 55.12 DRIP SHIELDS shall be fabricated for all field mounted panels / instruments / instrument racks / JB Racks / control cabinets etc. The hardware / material shall be supplied by BHEL. The fabrication forms part of erection work.
- 55.13 The motors, motorized valves actuators and solenoid valves will be erected by other agency. Their electrical commissioning, wherever required, is to be carried out by the agency within the subject scope of work at the finally accepted rates of applicable item as per Rate schedule. The staff earmarked for commissioning will carry out the work in association and guidance of BHEL Engineer as a part of system commissioning for which no extra cost will be paid by BHEL.
- 55.14 All electrical panels, control gears, motors and such other devices shall be properly dried by heating to improve IR value, before they are installed and energized. Bearings, slip rings commutators and other exposed parts shall be protected against ingress of moisture and corrosion during storage and periodically inspected.
- 55.15 The equipment should be preferably in its original package and should not be unpacked until it is absolutely necessary for its installation or advised by BHEL engineer. The equipment should be best protected in its cases. It should be arranged away from walls.
- The wooden pallet provided for packing itself can be retained for raised platform to protect equipment from ground damp, sinking into around and all the equipments, materials and goods kept in the store room should be identified and registered in a book. Inspection report should be recorded. Any discrepancy observed should be communicated to site engineer.
- The packing material shall be retained if the cubicle is to be repacked after inspection.
- 55.16 Certain instruments like pressure gauges, pressure transmitters, temperature gauges, flow-switches and indicators, etc., are received in assembled condition as integral part of equipment. *Contractor shall be responsible for safe receipt, installation and custody of these instruments supplied mounted on skids / equipment.* The calibration of skid / equipment mounted instruments shall be arranged by contractor. The contractor shall arrange for removal, calibration and re-installation of the instruments. The contractor will maintain the list of all the instruments removed & reinstalled. Instruments after removal and before reinstallation shall be considered in custody of the contractor for this package.
- 55.17 Earthing installations: All instruments/panels, cable trays, JB's etc. are to be earthed as per standard Earthing procedures/practices.
- All equipments shall be earthed by two separate and distinct connections. Earthing terminals will be available in all equipment supplied by BHEL.
- 55.18 L OOSE ITEMS-
- The loose items supplied for the main equipment falls into various categories like tools, cables, prefabricated cables, console inserts, recorders, VDU/CRT, other display units, printers, various gauges / instruments, sensors and transducers, cable

glands, cable ducts, frames, racks, etc. These are to be categorized and stored separately.

- Guidelines for handling of electronic modules to be strictly followed.
- All the modules shall be handled by qualified persons only.
- Electronic modules should only be touched when it is absolutely essential to do so.
- Before touching any electronic module, the operator should discharge the static electricity by earthing himself or better still, ensure constant discharge by wearing an earthed wrist strap.
- The operator should not wear clothing made entirely from synthetic fibres, but a mixture containing at least 65% cotton.
- The PCB should always be held by front panel or by module frame and electronic components / connectors should never be touched.
- The electronic modules should not be placed close to television sets or CRT units.
- Soldering irons and any other tools used must be grounded.
- All modules using CMOS components are packed in antistatic bags when transported loose to avoid ESD failures. The antistatic bags must always be used to transport modules at site from one place to the other.

55.19 All Instrumentation cabling includes proper glanding, ferruling, termination, lugging, tagging at proper interval (as suggested by BHEL/NTPC), dressing etc. required for control and instrumentation scope of works shall be part of this work. Cable laying include cutting to the required length, laying in overhead/underground cable trench/through pipes/flexible conduits, dressing/clamping in tray, drilling of holes in gland plates in panels and junction box, glanding, splicing, dressing of spliced wire inside the panel and JBs, providing PVC numerical/alphabetical/printed ferrules, termination by using crimp type copper tinned/aluminum lugs, insulated/un-insulated, termination (crimp, soldering, etc.), plug-in connections with insert type crimping, providing identification cable tags, PVC/aluminum at both the ends and at appropriate interval throughout the route length, continuity checking, insulation resistance checking, high voltage test on HT cables.

Wherever cable glanding is not possible, either due to the gland plate size limitations or more number of cable entries, prefab plug-in cables, etc., for such cases cables may have to be lifted inside the panel by either making cut-out in gland plate and providing rubber profile for sharp edge protection or alternatively, providing 4" or 6" PVC pipe coupling gland and these pipe coupling gland shall be supplied by contractor within the quoted rates.

Cable shielding – all signal cables are supplied with bare shielded copper wire/with braided wire shield. Generally shield wire is kept isolated at instrument/field device end and continuity is maintained through JBs and grounded at panel end only. While terminating the shield wire either in panel or JBs, PVC sleeves are to be used to avoid two-point earthing.

The erection contractor shall make every effort to minimize wastage during erection work. In any case, the wastage shall not exceed the following limits i.e. 1-1.5 %.

55.20 FIELD INSTRUMENTATION

- Various type of primary/secondary indicating/recording instrument for pressure, temperature, flow, level and analytical measurement shall be supplied either loose or mounted along with the equipment.

- Scope of work under erection/calibration/testing/commissioning shall include calibration, setting, adjustment, writing instrument tag number with paint, report making, installation, servicing, minor repairs/servicing, putting instrument into service, signal checking from field upto the functional group panels and remote indicating instrument, functional checks, interlock and protection/alarm/loop checks by simulating the field devices, providing assistance for trouble shooting during pre-commissioning/post-commissioning till system is handed over to the customer.
- It is the responsibility of contractor to make erection, calibration/testing protocols for various measuring equipments/devices and they should get duly certified by customer/BHEL engineer and should be submitted to BHEL engineer regularly. However, sample formats will be given by BHEL and have to be printed by contractor in adequate numbers.
- Contractor shall establish calibration laboratory with adequate facilities and they should arrange standard test instruments duly calibrated from recognized agencies and calibration report of the same to be submitted prior to start of calibration of the field instruments/devices.
- Installation of instrument shall also include drilling of holes and tapping for mounting of instrument and local instrument frames/panels and supply of hardware for mounting of the instrument.
- Some instruments may need repeated calibration / replacement. The same will be carried out by the contractor at no extra cost to BHEL including calibration of instruments needed for replacement, which will be supplied by BHEL.
- Some devices may need removal, calibration / testing, re-fixing, adjustment, etc., and commissioning. Separate payment shall not be made for this. Also, the contractor shall remove such devices prior to erection either at site or at store to avoid damages/pilferages and keeping in safe custody and the same shall be installed prior to commissioning of such equipment.
- It shall be the responsibility of the contractor to ensure that the calibrated instruments show correct reading while installed in the system. However, recalibration may become necessary due to reasons not attributable to the contractor, e.g. Lapse of Time after first calibration, Need for change in range/parameter, etc.
- The contractor shall keep record of such instrument with the reason for re-calibration and certified by the BHEL Engineer.
- For the very few cases where required, the contractor shall carry out re-orientation of bottom/top entry arrangement for process connection if needed due to site condition in existing instrument rack/enclosure/JB and re-location of existing instrument including removing of the existing tubing and re-installation of the same at appropriate location due to any change in grouping of the instrument and no extra payment shall be applicable.
- In certain cases instruments / devices are supplied on equipment or drawn by other agencies as part of mechanical package. The same are to be received or to be collected from other agencies for keeping in safe custody to avoid damages. The same are to be erected back after calibration for which unit rate shall be applicable for erection and calibration. Contractor shall maintain record of such instrument duly certified by BHEL engineer. However for removal of such instrument, no separate rate/payment shall be applicable.
- The entire work of erection, testing, commissioning of the connected devices/equipments as listed in rate schedule is to be carried out including laying of peripherals cables (either plug-in or plugs to be fabricated at site).

55.21 Only BHEL/CUSTOMER approved electrodes and filler wire will be used. All electrodes shall be baked and dried in the electric electrode-drying 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. The electrodes brought to the site will have valid manufacturing test certificate. The test certificate should have a co-relation with the lot number / batch number given on electrode packets. No electrodes will be used in the absence of above requirement. The thermostat and thermometer of electrode drying oven will be also calibrated and test certificate from Govt. approved / accredited test house traceable to National standards will be submitted to BHEL before putting the oven in use. The contractor shall also arrange periodical calibration for the same.

All welds shall be painted with anticorrosive red oxide paint once radiography and stress relieving works are over. Necessary consumables and scaffolding etc including paints shall be provided by contractor at his own cost.

55.22 INSTRUMENTATION

(A) PANELS – Max Control (SG /TG Panels) / Distribution / Starter Panels/ Power, Control & Relay (LTMCCs, AVR Etc.) Etc.

Erection at site / control room including chipping of floor, fabrication and fixing of base channel frame, leveling & alignment with spirit level, welding the base channel to the embedded plates / channels, grouting, fixing of anti-vibration pads, termination of inter panel connections, mounting / connections of loose instruments, inter panel bus bar connections, commissioning including loop checking, system checking, and putting necessary controls on automatics. **Tenderer may note that fabrication / fixing / painting of base channel (including supply of paints) / suitable steel stool, if required, is included under the scope of this work.** Checking of internal wiring, rectification, testing and calibration of equipment mounted inside is in the scope of contractor. The contractor may have to change / replace items found faulty without any extra cost; however materials for this shall be provided by BHEL. Mostly panels will be delivered fully wired. However wherever required termination of loose wires, bus wires is to be done. Canopy for panels will be supplied loose & shall be installed by the contractor after erection of panels. The cleaning of panels has to be done with electrical vacuum cleaner, besides conventional cleaning with brush etc. The drilling of holes in the gland plates for cable entry shall be part of panel erection. All blank holes / gaps in the gland plates / boxes etc. shall be properly sealed. The base frames shall be painted suitably. The contractor shall carry out the plugging and sealing of left out holes in the gland plates and other openings at the bottom of panels at his own cost by using fire retardant mortar or good quality sealing material as advised by BHEL .

Any minor alterations required in the bus bar arrangement, wiring in the panels/ cubicles shall also form part of the work. During testing, commissioning, some equipment / modules may need repairs / replacements. All such replacements / repairs and assistance during commissioning and running of the unit till handing over to the Customer are part of the scope as some of the test / commissioning will have to be done after the machine is running on various loads.

Tenderer may note that fabrication / fixing / painting of stands for Panels will be included in quoted / accepted price of respective item. No separate payment will be released for fabrication / erection of these stands.

(B) CABLE TRAYS

Ladder, prefabricated, slotted or duct type cable trays shall be supplied. Cable tray erection work as per BOQ Cum Rate Schedule shall include fabrication of supports to suit site requirement, fixing of support in position by welding as per requirements / engineers instruction. Fixing of cable trays and racks shall be by welding or with the fasteners. No separate payment will be released for fabrication / fixing / painting of support structure for cable trays (Including supply of paint).

Jointing of trays can be carried out by bolting / welding as per direction of Engineer. Contractor shall carryout cutting of tray only by Hacksaw for obtaining proper routing from standard lengths supplied. Materials for support fabrication like flats, channels, angles etc. shall be supplied by BHEL free of cost. The cutting & welding points on trays will be painted by primer & Aluminum paint by the contractor including supply of paint within the erection price and no extra cost to BHEL. These cable trays may also be required for laying copper tubing, plica type / GI flexible conduits, local cabling and metal temperature Thermocouples.

In many cases, trays are supplied with tray covers. These covers have to be erected after completion of bottom cable tray and lying of cables etc. The covers are to be properly secured on the bottom trays and no separate payment will be made for putting these covers. If required, GI / Al strip clamps are to be used.

Contractor will be paid for fabrication / erection as per applicable rates for structural steel fabrication / erection required for Cable tray stands/supports.

(C) CABLE LAYING

Laying, dressing & clamping (by Nylon / PVC ties or Aluminium strips or any other method and required ferrules as specified by BHEL Engineer) of the cables in the cable trays / angles. The final dressing of cables on cable trays not erected by contractor shall also be done with Nylon Cord / Aluminium strip. Cost of cable laying as per BOQ Cum Rate Schedule shall include the consumables such as required ferrules, Nylon / PVC ties & Aluminum strip required for dressing / clamping. The cost of required Nylon / PVC ties & Aluminum strip shall be in the scope of contractor within the awarded contract value.

The cable run number shall be provided by punching Aluminium Tag plates and tying suitably with nylon ties (at both ends and at regular intervals as advised by BHEL Engineer) which shall be arranged by contractor at his cost. Nylon / PVC ties & Aluminum strip required to be provided for cable tags within a span of 5 mtrs / as per documents and specifications shall have to be provided by the Contractor.

While laying cables, existing cable tray covers and false flooring may require to be removed and re-fixed. The same has to be done at no extra cost to BHEL.

(D) CABLE TERMINATION

The Cost of Cable Laying as per BOQ Cum Rate Schedule Shall also include the Cost of Termination with Suitable Crimping Type Lugs Including Supply of Ferrules (for cross / direct ferruling as per BHEL instructions). Only Cable Lugs & Glands Shall Be Issued By BHEL As Free Issue Item. Drilling of holes in gland plates of HT / LT switchgear, transformer, control panels, JBs etc as per requirement shall also be part of cabling at no extra cost to BHEL.

The contractor shall carryout insulation testing, simulation testing etc. as per the instructions of Engineer at site.

Screen of signal cables shall run in insulated sleeve (to be arranged by contractor at no extra cost) and shall be terminated as per the instructions of the BHEL Engineer.

(E) JUNCTION BOX, PUSH BUTTONS ETC

Includes fabrication / fixing / painting of stands for junction boxes / push buttons / frame mounted panels etc will be included in quoted / accepted price of respective item. Tenderer may note that fabrication / fixing / painting of stands for junction boxes / local push buttons / indication boxes etc. will be included in quoted / accepted price of respective item. No separate payment will be released for fabrication / erection of these stands.

(F) RIGID PIPE/CONDUITS

Cutting / threading of standard lengths of conduits, laying on fabricated supports or on floor, using screwed fittings, clamping, and sealing of open ends. Approved Good quality sealant (required sealants to be brought by contractor, free of cost i.e. part of the contract, as per BHEL engineer's instruction) shall be used to make the joint water proof.

(G) PLICA FLEXIBLE CONDUIT

Laying of conduits in cable trays, end connection with instrument / J.B. / panel, using suitable connectors / unions etc. (This shall be supplied by BHEL). Suitable thread / Plica sealant (required sealants to be brought by contractor free of cost i.e. part of the contract, as per BHEL engineer's instruction) shall be used to make the conduit system water proof. Aluminum painting, clamping and tagging in tray / angle forms part of erection job.

(H) EARTHING

Earthing work mainly involves laying and tack welding of conductors on columns / beams at every one meter interval and bolted connections with equipment at least at two points. Low hydrogen content electrodes shall be used for welding. All the galvanized items shall be given surface treatment (by thoroughly cleaning with sand paper and / or cotton cloth to make the surface clean, smooth & free from any type of spots) at the welded joints & the places where galvanizing has been damaged. Welded joints shall be applied with two coats of cold zinc paint whereas portions with damaged galvanizing shall be applied with single coat.

Earthing work shall also include the erection / laying of earthing below ground (if required like for electronic earthing) and above ground as per drawing, documents and specifications.

(I) INSTRUMENTS (TRANSMITTERS / GAUGES / SWITCHES / TEMPERATURE SENSING ELEMENTS LIKE RTDs & THERMOCOUPLES)

- For instruments supplied loose, the scope includes issue from stores, calibration, erection (including fabrication and fixing of frames / stands by welding to steel structure or by chipping & grouting with RCC columns / floor) and charging / loop checking. The work includes installation of housing connecting manifold / PG valve on supports / racks to be suitably fabricated for the instruments being supplied loose.
- For instruments supplied duly mounted on skids / racks, the scope includes dismantling from skids / racks, reinstallation after testing / calibration, restoring electrical connections, if any, pressure testing of connected piping and charging / loop checking. Servicing of manifolds PG valves shall also form part of erection job within the quoted prices.
- Some instruments may need repeated calibration / replacement. The same will be carried out by the contractor at no extra cost to BHEL including calibration of instruments needed for replacement, which will be supplied by BHEL.
- Erection of thermo elements like RTDs & Thermocouples includes erection of thermo wells, wherever required, at no extra cost to BHEL. The contractor, as directed by BHEL Engineer, will provide tags on all the instruments at no extra cost to BHEL. Tenderer may note that fabrication / fixing / painting of stands (including supply of paints) including fabrication / erection of Instrument canopy (wherever required) for instruments will be included in quoted / accepted price of respective instrument. No separate payment will be released for erection of gauge board as this will be included in item rates of instruments mounted on the gauge board. Contractor will be paid extra for fabrication / erection of stand only for the weight in excess of 25 kg per instrument and this extra weight will be paid as per applicable rates for structural steel fabrication / erection.

(J) DETECTORS / VIBRATION, SPEED & OTHER TURBOVISORY PICK UPS:

Blue matching with the assembly fixtures / main equipment surface, trial fixing, fixing by drilling / tapping, final doweling. Moreover some detectors may have piggy-backs signal detectors mounted on them as such these forms part of detectors assembly. The integral cables of the above shall be routed & dressed properly up to their JB / Proximeter. Erection of proximitors, proximitor housings / JB required for respective pick up and calibration / commissioning of pick ups will be included in quoted / accepted item rate of **respective pickup**.

(K) PNEUMATIC TUBES (COPPER / SS TUBING):

Fabrication and erection of single angle supports/ tray supports for single multi run tube, Laying tubes in the angles/ trays from the panel to the equipment, instrument to instrument, air supply line to drive/ instrument, air line connections, clamping properly as per standard ferruling and termination at both ends. This includes all fittings and needle valves, stop

valves etc. also. Proper tagging of valves and pneumatic tubes on both ends shall be done for proper identification. No extra charges will be claimed by contractor for any modification carried out after laying of pneumatic tubes/ draft pipelines due to site requirement in general.

(L) IMPULSE LINE (AS / CS / SS)

Fabrication and erection of channel/ angle/ slotted angle supports, cleaning impulse pipe with wire brush and compressed air, edge preparation, cold bending, laying to the required slopes, clamping, welding of isolation/ drain valves and fittings by butt/ socket welding lock joints. Servicing of valves, connecting with the process end and to the instruments, NDT, Hydraulic testing the impulse lines, and painting the lines as per requirement of BHEL engineer. The impulse line may have to be cleaned chemically for removing grease/ rusting. Proper tagging of valves and impulse lines on both ends shall be done for proper identification. No extra charges will be claimed by contractor for any modification carried out after laying of Impulse/ draft pipelines due to site requirement in general.

(M) COMPUTERS / PLC BASED EQUIPMENTS

All computer related items / equipment like CRT, monitors, printers, key boards, pre-fabricated connecting leads etc shall be installed in control room and control desk as per direction of BHEL Engineer. Cost of PC set (including printer, monitor, UPS, interconnecting leads etc) installation as per BOQ Cum Rate Schedule shall also include the cost of installation / placement of furniture (to be issued by BHEL as free issue item) as per requirement / instruction of BHEL Engineer. The Software installation and commissioning is not included in the scope of this contract. However, any assistance required for testing / commissioning have to be provided by the contractor within the quoted price. Hardware found defective during testing / commissioning and till handing over to Customer, have to be removed for repair / replacement and reinstalled within the quoted rates.

(N) ELECTRONIC WATER LEVEL INDICATOR SYSTEM

EWLI includes fixing of electrodes, local and remote indicator panel / display units and interconnection of these by cables. Only cost of laying cables for interconnection of EWLI system shall be measured and paid separately. Erection of all other equipments / panels/ display units forming EWLI system shall be included in the quoted rate per system.

(O) CALIBRATION OF CONTROL VALVES

The work also includes minor rectification / alterations in tubing, servicing of accessories, setting of limit switches, calibration of Actuators and position feedback transmitters.

(P) SAMPLE HANDLING SYSTEM / ANALYZER SYSTEM

Includes installation of main analyzer panel, analyzer, probes, sensors and other accessories like sample gas cylinders, mechanical / electrical interconnections

(including SS Tubing & Electrical heat Tracing, wherever required) between various components, energizing, testing & commissioning.

(Q) POWER CYLINDER ERECTION

Minor structure work required shall form a part of the work within the quoted rate of the respective cylinder. Contractor will be paid extra for fabrication / erection of stand only for the weight in excess of 25 kg per Power Cylinder and this extra weight will be paid as per applicable rates for structural steel fabrication / erection.

Erection of Power Cylinders also includes minor rectifications / alteration in the tubing, servicing of accessories, setting of limit switches, calibration of actuators and feedback position transmitters.

(R) CALIBRATION OF CONTROL VALVES

The work also includes servicing of accessories, setting of limit switches, calibration of actuators and position feedback transmitters.

(S) Assistance to be provided by contractor as per BHEL Engineers instruction for site testing of Misc. Electrical Equipments like Motors, Generators, etc wherever required is part of the contract. No extra cost is to be paid.

(T) DC system

DC battery chargers and UPS-

Erection of charger and UPS Panels , fabrication of base frames or stools (wherever applicable) and carrying out minor modification wherever required; Joining of panels, inter-panel wiring, busbar & earthbar connections, mounting of loose supplied items,. Erection of Isolator Fuse Boxes; Testing of complete board & including testing / calibration of all instruments and schemes; Dummy load test of Chargers including arranging of dummy load and temporary power supply etc.

DC Battery—

Erection of batteries after assembly of battery stands, inter-connection of batteries and first charging; Capacity testing using dummy load and subsequent recharging (in case of failure of capacity test, the charging Discharging cycle is to be repeated) Dummy load test of chargers includes arrangement of dummy load and temporary connection in absence of regular power supply.

(U) Transformers

The checking of foundation, leveling alignment etc. will be done by erection contractor. Receipt & transportation of transformers & accessories / auxiliaries from stores to site, erection after foundation checking and carrying out minor modification wherever required.

56.0 TESTING, PRE-COMMISSIONING, COMMISSIONING AND POST-COMMISSIONING:

- 56.1 Site testing shall be required for all equipment installed by the contractor to ensure proper installation, setting, connection and functioning in accordance with drawings, specifications and manufacturer's recommendations.
- 56.2 Commissioning protocols are to be prepared as advised by BHEL Engineer for getting approved by customer / Consultant. During erection of various equipment, prior to commissioning and after commissioning, protocols have to be made. The proforma and formats as approved have to be printed by the contractor in adequate numbers.
- 56.3 During each stage of commissioning, if any part of the instrument needs repair/rectification/rework/replacement, the same shall be done expeditiously and promptly by the contractor. Contractor's claim, if any, for such repair/rectification/rework/replacement etc. for reasons not attributable to contractor will be governed by clause on extra works of the special conditions of contract. The parts to be replaced shall however be provided by BHEL free of cost.
- 56.4 Testing, and pre-commissioning checks shall be as per relevant codes / practices and BHEL drawings / specifications/ approved commissioning Protocols and same shall include, but not be limited to the following:

(I) CONTROL & PROTECTION PANELS

- (a) Checking of complete wiring and insulation resistance.
- (b) IR test and loop checking of all field wiring in the panel.
- (c) Checking of all protection, metering and indicating schemes.
- (d) Calibration of all indicating and measuring instruments, relays, timers.
- (e) Checking of all auxiliary schemes e.g. space heating, illumination.
- (f) Checking of operation of all relays, switches and other indicators.
- (g) Commissioning of total scheme including relevant internal equipment.
- (h) Carrying out suitable modifications as per system requirement.
- (i) Carrying out primary injection, secondary injection, stability checks etc.

(II) MISC. INSTRUMENTS:

- All instruments shall be checked for proper installation, supports, impulse lines, cabling etc. and corrected, wherever required.
- All instruments shall be calibrated before installation and proper calibration record shall be maintained to the satisfaction of BHEL Engineer. Instruments received in assembled condition in panels etc. shall also be dismantled, calibrated and re-assembled as per advice of BHEL Engineer.
- All impulse and pneumatic lines shall be properly cleaned (oil flushed / chemical cleaned / air blown/ steam blown/ Hydraulic tested etc.) before being charged.
- Some of the instruments may require re-calibration during commissioning. The contractor shall remove such instruments, recalibrate and install within the quoted rates.

(III) DRIVES AND CONTROLLERS

- All drives such as power cylinders, pneumatic / motorised valves / dampers etc. and controllers shall be checked for proper installation supports etc. before commissioning.
- All transmitters shall be calibrated and limit switches shall be adjusted.
- All pneumatic and impulse lines shall be cleaned as per instructions of BHEL Engineer.
- All drives shall be operated by simulating various conditions to ensure healthiness of components of the system

(IV) BATTERY, BATTERY CHARGER, UPS

- Checking of battery charger panel.
- Calibration of all indicating and measuring instruments.
- Dummy load test of battery charger.
- Charging of battery and recharging after carrying out battery discharge test/ capability test of battery using dummy load.
- In the absence of regular power supply to battery chargers arrangements are to made for battery charging from temporary construction power supply points.

(V) TRANSFORMERS

- (a) Insulation resistance and earth resistance checks.
- (b) Checking and calibration of WTI & OTI etc.
- (c) Winding resistance, vector group, turns ratio test on different taps, magnetizing current, core balance check etc.
- (d) Turns ratio, polarity, insulation resistance and winding resistance checks on all CT's.
- (e) Oil filtration and centrifuging, BDV of oil etc.

56.5 In case any defect is noticed during tests, trial runs and commissioning such as loose components, undue noise or vibration, strain on connected equipment etc. the contractor shall immediately attend to these defects and take necessary corrective measures. If any readjustment and realignment are necessary, the same shall be done as per Engineer's instructions including repair, rectification and replacement work by the contractor at his cost. The parts to be replaced shall be provided by BHEL.

56.6 During this period, though the BHEL/ NTPC will also be associated in the work, the contractor's responsibility will be to arrange for the complete requirement of supervision, labour, consumable, T&P and IMTEs required till such time the commissioned units are taken over by the BHEL's customer.

56.7 During commissioning activities and for carrying out various tests, special instruments etc, have to be temporarily erected and commissioned to suit the commissioning activities. Contractor will provide the necessary equipment. Contractor has to carry out the erection, calibration, dismantling of the same. After completion of activities the temporary systems have to be removed and to be taken back at no extra cost to BHEL.

- 56.8 The pre-commissioning activities will start with various trials, commissioning operations shall continue till units are handed over to customer. Simultaneous commissioning activities will be progress in various areas, checking of equipment erected, making ready for trial runs; all these works need specialised gangs including electricians / instrument technicians in each area to render assistance to BHEL commissioning staff. Contractor shall earmark separate manpower for various commissioning activities. The manpower shall not be disturbed or diverted.
- 56.9 It shall be the responsibility of the contractor to provide workmen of various categories in sufficient numbers along with Engineers/ Supervisors including necessary consumables, T&P etc. during pre-commissioning, commissioning and post commissioning period for commissioning of equipment and attending any problem in equipment erected by the contractor till handing over. The rates quoted shall include all these contingencies also.
- 56.10 It shall be specifically noted that the above employees of the contractor may have to work round the clock alongwith BHEL commissioning Engineer and hence overtime payment by the contractor to his employees may be involved. The contractor's accepted rates shall be inclusive of all these factors also.
- 56.11 In case, any rework is required because of contractor's faulty erection which is noticed during commissioning, the same has to be rectified by the contractor at his cost. If any equipment / part is required to be inspected during commissioning, the contractor will dismantle / open up the equipment / part and reassemble/redo the work without any extra claim.
- 56.12 During commissioning, opening and closing of valves, modifications in wiring, realigning of equipment, re-calibration of instrument, attending to leakage, minor adjustments of erected equipment may arise. The accepted rates shall include all such works.

57.0 FINISH PAINTING

Contractor at no extra cost to BHEL shall supply all specified paints, thinners and primers as per drawing, documents and specifications whatsoever; tools and other consumables including scaffolding materials required for finish painting. Paint is to be BHEL/ NTPC approved make only and painting should be as per colour scheme and quality approved / specified by Engineer.

All the equipment (control-panels etc.) within the scope of these specifications shall be received duly painted. For panels, during storage and handling the same may get peeled off / damaged / deteriorate. All such surfaces are to be thoroughly cleaned and to be touch up painted with suitable approved primer / finish paint matching with shop paint / approved final colour along with required tools and other consumables within the awarded price of contract.

All paints, tools and other consumables including scaffolding materials required for painting shall be arranged and provided by contractor within the quoted rates. Paint and other materials so purchased shall be ISI marked and as per drawing, documents and specifications and painting should be as per colour scheme and quality approved / specified by Engineer. Valid Test certificate for the paint so supplied shall be made available before use of the same on work. The contractor shall provide legend on equipment in size specified by Engineer. Letter writing shall be done in Hindi /

English or in both languages. The printers have to under go test and only qualified painters will be allowed to work.

Certain equipment shall require spray painting (touch up). The contractor shall make arrangements of the required equipment for spray painting of such equipment **including supply of paint**, at his own cost. Spray painting at the job site shall be permitted only at times and locations approved by the owner / Engineer.

All paints should be stored in well-ventilated store. The painters and other personnel deployed should use proper protective equipment to avoid inhalation of fumes.

All the fabricated frames, instrument racks, Junction box frame, trays, supports, panel base frame, impulse pipes, etc., wherever applicable shall be first painted with one coat of primer paint (metal red oxide) and then two coats of synthetic enamel paint of approved shade by BHEL Engineer after thoroughly cleaning the surface of dust, rust, scale, grease, oil, etc., by wire brushing, scrapping or any other suitable method. The quoted rates should be inclusive of all these including supply of paints and consumables.

Other equipments like JB's, Panels etc., shall be painted with two coats of synthetic enamel paint. The quoted rates should be inclusive of application of two final coats of synthetic enamel paint. All the consumables such as wire brush, other cleaning materials, painting implements, etc., is to be arranged by the contractor at his own cost. All equipment painting will be done by spray painting.

All the weld joints of GI cable trays and GI structural members shall be applied with a coat of cold galvanizing zinc paint and paint shall be arranged by contractor at his cost.

58.0 FACILITIES TO BE PROVIDED BY BHEL/CONTRACTOR

58.1 BHEL shall provide adequate and open space for temporary storage / fabrication, free of all costs, to contractor with drainage, drinking water, electricity and sanitation facilities within the plant boundary. It is the responsibility of the contractor to construct their office sheds, provide all utilities; and dismantle and clear the site after completion of work or as and when required, as a part of his scope of work.

58.2 NTPC / BHEL shall not provide area for labour colony.

58.3 The Contractor shall be responsible for providing all necessary facilities like residential accommodation, sanitation, 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.

58.4 Construction power, for construction purposes will be provided free at one point near erection site from supply point.

The contractor shall submit to the Engineer his electrical power requirements. Further distribution will have to be made by contractor at his cost. All wiring must comply with local regulations (as per NTPC compliance) and will be subject to Engineer's inspection and approval before connecting supply. Required calibrated energy meter for measurement of power consumed has to be arranged / installed by Contractor at his cost.

NOTE:

- The contractor will be provided construction power free of charge.
- They, however, would have to ensure that there would be no wastage. Periodical audits will be held to ensure that these resources are being optimally used. For this the contractor has to provide an energy meter at his end.
- In case any wastage is observed BHEL reserves the right to recover any charges / penalty as deemed fit.
- Contractor will have to provide proper insulated cables and proper power distribution board consisting of ELCBs, MCBs etc. for power distribution and joints, if any, will be done with proper jointing kits.

NTPC shall supply free of charge water through pipe connection at suitable points for construction and electricity at required voltage (415V, 3 phase and 230 V single phase) for construction, operation of EOT cranes, plant start-up, pre-commissioning, commissioning activities including testing. Electricity for construction power and light will be brought by NTPC / BHEL at one point. Contractor shall arrange further distribution for construction purposes.

- 58.5** Permanent lighting inside the powerhouse is to be provided by NTPC. Till such time such arrangements are made, the contractor at his cost should arrange for temporary lighting in and around his work area, as required.
- 58.6** BHEL will not be responsible for any loss or damage to the contractor's equipment as a result of variation in voltage or frequency or interruptions in power supply.
- 58.7** 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.
- 58.8** The contractor while drawing construction power supply from Distribution Board should strictly adhere to following points.
- All electrical installations should be as per Indian Electricity rules.
 - All distribution Boards installed by the contractor should be constructed with fireproof materials viz. Steel frames, Bakelite sheets etc.
 - Connection for single phase should be taken from phase and neutral. Nowhere the connection should be taken with earth as neutral.
 - 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.

- Contractor has to make their own earthing arrangement for their equipment / DB earthing.
- All electrical equipment / tools and plants should be properly earthed. DBs to be earthed diagonally opposite at two points.
- Contractor should use “MCCB” and “ELCB” either on incoming or outgoing connections to the DBs.
- Contractor should ensure that all the CBs / TPNs/ Fuses/ MCCB / ELCB cables etc. should be of adequate rating/ capacity.
- For permission of supply connections contractor has to submit a test report of their installations with a single line diagram of connected/ proposed loads.

58.9 ELCB will be tested once in a week or as directed by BHEL by actually simulating the earth leakage for all installations and the same shall be recorded in the logbook to be maintained by the contractor.

58.10 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.

58.11 Adequate lighting facilities such as floodlights, 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.

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

58.12 Compressed air required for construction purposes shall be arranged by Contractor. However, compressed air required for the instrumentation, start-up and plant operation purposes shall be provided by the owner as per the requirement and specifications indicated by the contractor.

58.13 Contractor should install a PC along with MODEM with latest software to connect with our server (LAN) at site for exclusive use of BHEL.

58.14 The contractor shall adjust his working shift hours accordingly and deploy additional manpower if necessary so as to achieve the targets within the quoted rates of contract. 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.

59.0 TIME SCHEDULE

59.1 *The contractor is required to commence the work within 15 days from the date of issue of letter of intent unless BHEL decides to fix any other later date. However, the actual date of start of work, to fix up zero date of the*

contract, will be certified by BHEL Engineer after adequate mobilisation of manpower and T&Ps by the contractor.

59.2.1 Entire work as detailed in tender specification shall be **completed within 16 months from the scheduled date of start of work** as per the programs / milestones indicated by BHEL from time to time. Contractor has to mobilise adequate resources to meet BHEL's commitments to their customer as indicated from time to time.

In case due to reasons not attributable to the contractor, the work gets delayed and additional manpower / resources have to be mobilized so as to expedite the work to meet various milestones, same shall be done within the quoted rates, at no extra cost to BHEL. In the event the contractor fails to respond to these requirements, BHEL shall take appropriate actions to meet customer's commitments in line with the provisions of General Conditions of Contract.

59.3 The various milestone dates to be achieved, for UNIT #1, as per the current status of contract is as below:

<u>MILESTONES</u>	<u>MONTHS</u>
• Start of Erection of this package	15 days from issue of LOI
• Readiness of C&I for Boiler Light-up	4 th month
• Turbine on Barring Gear	8 th Month
• Rolling & Synchronisation Readiness	9.5 th Month
• Trial operation readiness & handing over	12 th Month

The milestones of **Unit # 2** shall follow with a **time lag of Four months**.

Notes:

Depending upon front and material availability all or some of the above milestones may be required to prepone by *one month*. Contractor is required to mobilise additional resources to meet above requirement within their quoted lumpsum price.

It is the responsibility of the contractor to engage his workmen to execute the awarded scope of work in *three shifts basis* for achieving the targets set by BHEL within contractor's finally awarded rates / prices of this contract.

Contractor has to mobilise all required resources including manpower to achieve above schedule for which no compensation will be payable. However, in case of contractor discharges his contractual responsibility even before schedule contract period, he will be allowed to wind up his set up without any financial implications on either side.

59.4 The work under the scope of this contract is deemed to be completed in all respects, only when the contractor has discharged all the responsibilities laid down in the contract. *The decision of BHEL on completion date shall be final and binding on the contractor.*

60.0 OVER RUN

- 60.1 In case due to reasons not attributable to the contractor, the work gets delayed and scheduled completion gets extended, the contractor shall **not be entitled for any over run compensation for a period of first 2 (Two) months after the contractual completion date**. In case the scheduled completion time gets extended beyond **2 (Two) months** as stated above, the contractor shall be considered for payment of fixed over run charges **@ Rs. 60,000/- (Rupees Sixty thousand only)** per month on receipt of advance notice intending to claim over run & on fulfillment of following conditions:-
- a) The reasons for delay in completion of work are not attributable to contractor but however subject to the provisions of clause - 31.
 - b) The targets fixed during the over run period are achieved by contractor.
- 60.2 Once the claim of over run charges is admitted no other compensation whatsoever (like for delays in receipt of materials, availability of fronts etc.) will be entertained.
- 60.3 The contractor shall maintain sufficient workforce and other resources required for completion of the job expeditiously for the entire contractual period including total extended period.

61.0 TERMS OF PAYMENT

- 61.1 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.
- 61.2 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.
- 61.3 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;
- I. 88 % of contract value shall be payable on fulfillment of following conditions:**
- (A) ***For Equipment / items such as Panels, JB, impulse pipe, tubing, cabling etc.***
- A.1 45% of item rate shall be payable on erection / installation /cable laying;
 - A.2 23% of item rate on final alignment, welding, clamping, termination etc;
 - A.3 15% of item rate on testing, pre-commissioning, charging of installed panels; etc. (with certification of BHEL commissioning Engineer)
 - A.4 5% of item rate on pending point clearance.
- (B) ***For Instruments / items where calibration and testing is required.***

- B1 20% of item rate on calibration and testing;
- B2 30% of item rate on erection, installation alignment and termination wherever involved;
- B3 18% of item rate on individual device loop checking of instruments etc;
- B4 15% of item rate on system loop checks, pre-commissioning checks by simulation/ field calibration or with actual system operation;
- B5 5% of item rate on pending points clearance.

NOTE:- Further percentage break up for payments against above, if required will be mutually discussed and finalized at site.

II Milestone payments 6 % of awarded Contract value (CV)

- 2 X 1.0% of CV on readiness for Boiler Light-up.
- 2 X 0.5% Turbine on Barring Gear.
- 2 X 0.5% of CV on Unit Synchronization.
- 2 X 0.5% of CV on Full loading of Unit.
- 2 X 0.5% of CV on Unit trial operation.

NOTE:

1. If the commissioning activities could not be carried out due to no fault of contractor, BHEL Site incharge, at his discretion, after recording reasons for exercising such option, can split and release payment up to 50% of milestone payment on completion of work, to the extent possible, required for carrying out that particular milestone/ commissioning activity.
2. The above break up is only for payment purposes and does not cover all equipment in the scope of the subject work. The total scope of work shall be as detailed in the tender specification.
3. Prorata payments shall be made every month in proportion to the work carried out by the contractor during the month, which shall be measured on the basis of percentages fixed above. The engineer shall carry out the assessment of the work for payment within the above percentages and it shall be final and binding on contractor. However, further percentage break up for payment against above clauses, will be mutually discussed and finalized at site.
4. Where particular activity on the system is not required, BHEL at its sole discretion may release payment along with any other activity as deemed fit.

- III. An amount limited to 2.0 % of CV of the awarded contract value shall be payable in one or more installments, solely at the discretion of Construction Manager/ BHEL at different stages of the contract execution to facilitate resource

augmentation or to meet any exigency of work. In case of its non-utilization 'OR' its part utilization, the entire/balance payment against this category shall be released along with full loading of unit.

IV **2.0% of CV** shall be payable on handing over of the unit to BHEL's customer or 3 months after the contractor has discharged his responsibilities as stipulated in this contract, whichever is earlier, provided delay in handing over of the unit is not attributable to contractor. The unit shall be deemed to be handed over on completion of trial operation.

V The balance **2.0% of CV** will be payable on completion of all pending work, rework wherever required, reconciliation of materials, clearance of site and labour colony area in all respects and on submission and passing of final bill.

NOTE: Above payment at IV & V shall be released after adjustment of the contract value based on actual work carried out.

Annexure-I

LIST OF T&Ps AND IMTEs BEING PROVIDED BY BHEL FREE OF HIRE CHARGES ON SHARING BASIS

SL No.	EQUIPMENT	QTY	Remarks
1.	Suitable capacity crane (14 / 20 T)	1 No.	
2.	EOT crane in TG hall	1 No	

.NOTES:

1. In addition to above any special tools and tackles, if supplied by the manufacturer will also be provided to the contractor free of hire charges as and when made available.
2. BHEL at entirely its discretion may provide higher capacity crane, as available at site, for handling equipment (for VFD Transformers, if required) which can not be handled with above crane or any of the lifting tackles of the contractor deployed in this contract. The fuel and operation of such crane shall be in the scope of contractor. All other clauses shall be as per the clauses applicable for the T & P Items specified in this contract.
3. Other terms and conditions regarding above items shall be as per tender clause 38. (Tools and Plants / IMTEs).

Annexure-II**INDICATIVE LIST OF T & Ps TO BE ARRANGED BY THE CONTRACTOR**

Sl.No.	EQUIPMENT	QTY
1.	20T Capacity trailer with pulling unit / Truck	01 no. /As per requirement
2.	Hydra crane 10 / 12T	As per requirement
3.	Grinders	As per requirement
4.	Pedestal mounted Drill Machine	As per requirement
5.	Vacuum Cleaner	2 No.
6.	Hydraulic crimping tool	2 No.
7.	Hand crimping tools	Adequate Nos.
8.	Industrial vacuum cleaner	1 No
9.	Blower	1 No
10.	Hydraulic pipe bending machines	2 nos.
11.	Hydraulic test Pump	As per requirement
12.	Welding Transformers / Welding generators	3 Nos. / As per requirement
13.	Gas cutting set	Adequate Nos
14.	Calibrated Torque wrenches	As per requirement
15.	Allen key set / spanners	As per requirement
16.	Oil Filtration Machine suitable for Transformers with oil tank	As per requirement
17.	Suitable capacity Hydraulic jacks for handling transformers	As per requirement
18.	Transformer Oil Testing Kit (Motor operated) 0-100 KV	as required

NOTES:

- The above list is tentative specifying only major T&Ps to be deployed by contractor. However, as per site requirement, all additional / other tools and plants in good and safe working conditions which are required for satisfactory & timely completion of work shall also be deployed by the contractor within finally accepted rates.
- Other terms and conditions regarding above items please also refer clause 38 (T&Ps / IMTEs).

Annexure-III**Indicative / Tentative list of IMTEs to be arranged by the CONTRACTOR for Control & Instrumentation**

Sl. No.	EQUIPMENT	QTY
1.	100V/ 250V / 500 V / 1000V, (Hand operated) Megger	2 Nos.
2.	2.5/5 KV (Motor operated Megger)	1 No.
3.	Digital Multimeters with current probe 4-1/2 Digits	4 Nos
4.	Digital multimeters 3-1/2 Digits	6 Nos
5.	Tong Testers (various ranges, ac/dc) including mA Range	2 Sets
6.	Analog Multimeter	1 Nos
7.	Single variac, 15A	1 Each
8.	Motor checker	1 No
9.	Leakage meter	1 No
10.	Variable DC regulated,0-30V,50mA, 0.2% accu. (Electronic voltage source with digital indication)	2 Nos.
11.	mA/mV source with 0-200 mA/200mV Digital display	1 No.
12.	Rehostat 100 Ohm, 10 A	3 Nos.
13.	High temp. instrument upto 600 deg. Calibration kit	1 No
14.	Decade Resistance box upto 20K ohms	01 No
15.	Continuity testers	as per requirement.
16.	Hydraulic test pump upto 250 Kg/mm ² ,+0.25 %accu.	1 No
17.	Intercom / telephone set for loop checking	as per Requirement
18.	Tachometer, 0-4000 RPM	1 No.
19.	Temperature recorder for 0-1000C 6/12 points with Thermocouples / rods and compensating cable	2 Nos.
20.	Master pressure gauge, 0 – 4 Kg/cm ² , 0.02 acc.	2Nos.
21.	Digital tong tester, 0-300A AC&DC	1No.

Tentative list For The Calibration of instruments

S.NO.	DESCRIPTION	RANGE	ACCURACY	QTY
1.	Dead Weight Tester	0-600Kg/cm ²	LC-0.5Kg/cm ²	01 Set
2.	Comparison test set (With Sub-standard Pressure gauges)	0-1 Kg/cm ²	$\pm 0.25\%$ Lc-0.02Kg/cm ²	} 01 Set
		0-4 k g/cm ²	----do-----	
		0-6 Kg/cm ²	----do-----	
		0-10kg/cm ²	----do-----	
		0-25Kg/cm ²	+0.25%Lc-0.25 Kg/cm ²	
		0-60Kg/cm ²	1 $\pm 0.25\%$ Lc-1.0 Kg/cm ²	
		0-250Kg/cm ²	$\pm 0.25\%$ Lc-2.5 Kg/cm ²	
		0- 400Kg/cm ²	$\pm 0.25\%$ Lc-2.5 Kg/cm ²	
3.	Glass U tube mercury mano-meter with standard steel Scale having leveling arrangement.	0-1000 mm	As per requirement	
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.	Digital Multimeter 3½ digit	Voltage 200 mV to 1000V, Current 200 mA to 10A DC, Current 20 mA to 20A AC, Resist 200 ohms to 20M ohms,	$\pm 1\%+1$ digit $\pm 0.8\%+1$ digit $\pm 0.8\%+1$ digit $\pm 0.5\%+1$ digit	2 No.

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. Calibration certificate of all the the listed IMTEs to be submitted BHEL, in advance.

3. Other terms and conditions regarding above items shall be as per clause no. 38 (Tools & plants / IMTEs).

ANNEXURE-IV

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:

ANNEXURE-V

**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-VI

GENERAL TERMS AND CONDITIONS OF REVERSE AUCTION (RA)

Against this NIT for the subject work, **tender shall be processed through Reverse Auction mode i.e., ON LINE BIDDING ON INTERNET. The General Terms and Conditions of the RA shall be as follows;**

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. BHEL will inform to the vendor in writing, in case of reverse auction along with the details of Service Provider to enable them to contact & get trained.
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 format (provided by Service provider) before start of Reverse auction. Without this, the vendor will not be eligible to participate in the event.
6. BHEL will provide the calculation sheet (e.g., EXCEL sheet) which will help to arrive at "Total Contract Value (Tentative) Based on Rate Schedule/BOQ".
7. Reverse auction will be conducted on scheduled 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 within 24 hours of Auction without fail.
10. During Reverse Auction, if no bid is received within the specified time, BHEL at its discretion, may decide to revise opening price/scrap the reverse auction process/proceed with conventional mode of tendering.
11. **Sealed bid Reverse Auction:** The opening bid (In the initial auction) of the bidders shall be same as that quoted in their Final Sealed price submitted to BHEL. **The bidders shall confirm in writing to BHEL that their opening bid (In both cases) shall be same as that quoted in their final sealed price bids submitted to BHEL against this NIT along with Technical Bid (Part-I).**
12. BHEL reserves the right to cancel Reverse Auction (RA) without assigning any reasons and resort to considering the sealed bids submitted by vendor for processing and finalizing the tender.
13. Any variation between the on-line bid value and the signed document will be considered as sabotaging the tender process and will invite disqualification of vendor to conduct business with BHEL as per prevailing procedure.
14. 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's standard practice.
15. Bids-given by the bidders during the Reverse Auction process will be taken as an offer to execute the work. Bids once made by the bidder, can not be cancelled/withdrawn and bidders shall be bound to execute the work as mentioned above at the final bid price. Should be bidder (Lowest) back out and not execute the contract as per the rates quoted, BHEL shall take action as appropriate.

ANNEXURE-VII

NO DEVIATION CERTIFICATE

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.: ERECTION, TESTING, COMMISSIONING, TRIAL OPERATION AND HANDING OVER OF CONTROL & INSTRUMENTATION PACKAGES FOR 2X490 MW, UNIT-5 & 6, DADRI NATIONAL CAPITAL THERMAL POWER PROJECT (NCTPP) AT DADRI, DISTT.-GAUTAM BUDH NAGAR, U. P. OF NATIONAL THERMAL POWER CORPORATION LTD.”

TENDER NO. BHEL: NR(SCT): DADRI:CNI: U-5 & 6:549

Dear Sirs,

With reference to above, this is to confirm that as per tender conditions, we have visited [Dadri 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)

ANNEXURE – A**Authorization of representative who will participate in the
on line Reverse Auction Process;**

1	NAME & DESIGNATION OF OFFICIAL	
2	POSTAL ADDRESS (COMPLETE)	
3	TELEPHONE NOS. (LAND LINE & MOBILE BOTH)	
4	FAX NO.	
5	E-MAIL ADDRESS	
6	NAME OF PLACE/ STATE/ COUNTRY, WHEREFROM S/HE WILL PARTICIPATE IN THE REVERSE AUCTION	