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

No. BHE/PW/PUR/MONTI-CLE/481

FOR

Handling at Storage Yard/Stores, Transportation to Site of Work; Erection, Calibration, Testing, Assistance for Commissioning; Final Painting and Handing Over of Electrical and Controls & Instrumentation Work of 2x45MW Steam Turbines & Its Auxiliaries, Turbo Generator and their Auxiliaries Set

at

Monnet Ispat Limited
Raigarh

Chhattisgarh

Part-I
(Technical Bid Specification, Notice Inviting Tender and GCC)

Bharat Heavy Electricals Limited
(*A Government of India Undertaking*)
Power Sector - Western Region
Shreemohini Complex
345-Kingsway, Nagpur - 440 001

Contents

Contents

LEGEND:

$: PLACED BEFORE 'GENERAL CONDITIONS OF CONTRACT' IN BOTH HARD AND SOFT COPY DOCUMENTS.

#: ATTACHED AT THE END OF HARD COPY OF TENDER SPECS. PART-I (TECHNICAL BID) AND AS A SEPARATE FILE TITLED 'WEB_NIT_GCC' AS SOFT COPY HOSTED IN WEB PAGE.

@: ISSUED AS SEPARATE BOOKLET IN HARD COPY AS **PART-II** AND AS SEPARATE FILE TITLED 'PRICE_BID' AS SOFT COPY HOSTED IN WEB PAGE.

Bharat Heavy Electricals Limited

(A Government of India Undertaking)
Power Sector - Western Region
Shreemohini Complex
345, Kingsway - Nagpur 440 001

Issue Details

Tender Specification No. BHE/PW/PUR/MONTI-CLE/481

NAME OF THE WORK:

Handling at Storage Yard/Stores, Transportation to Site of Work; Erection, Calibration, Testing, Assistance for Commissioning; Final Painting and Handing Over of Electrical and Controls & Instrumentation Work of 2x45 MW Steam Turbines, Turbo-Generator and Auxiliaries

AT

Monnet Ispat Limited.
Raigarh

Chhattisgarh

Earnest Money Deposit: Please see Special Conditions of Contract.

Last Date for Tender Submission: Please obtain updated information from web page http://www.bhel.com → Tender Notifications → View Corrigendums

These tender specification documents containing **Part- I** and **Part- II** are issued to:

M/s. ……

……

(These tender specification documents are not transferable)

For Bharat Heavy Electricals Limited

Dy. Gen Manager (Purchase)

Place: Nagpur
Date:

Bharat Heavy Electricals Limited
(A Government of India Undertaking)
Power Sector - Western Region
345, Kingsway - Nagpur 440 001

General Instruction to Bidders and Procedure for Submission of Sealed Tenders

The bidder must submit their tenders as required in two parts in separate sealed covers prominently superscribed as Part-I Technical Bid and Part-II Price Bid and also indicating on each of the covers the tender specification number and due date and time as mentioned in the tender notice.

Part-I (Technical Bid) cover-I

Excepting rate schedule, all other schedules, data sheets and details called for in the specification shall be enclosed in part-I "Technical Bid" only.

Part-II (Price Bid) cover-II

All indications of price shall be given in this part-II "price bid".

These two separate covers-I and II (part-I and part-II) shall together be enclosed in a third envelope (cover-III) along with requisite EMD as indicated earlier and this sealed cover shall be super scribed and submitted to Dy. Gen Manager (Purchase) at the above mentioned address before the due date as indicated.

The qualified bidder will be intimated separately about the status of their offer.

Bidders are requested to make specific note of the following conditions:

1. Contractor should have adequate resources including major T&Ps at his disposal for this job.

2. Contractor should have sound financial stability.

3. Bidder should meet quality requirement regarding workmanship, deployment of personnel, erection tools and necessary measuring and monitoring devices

4. All information as called for in various appendices and clauses of tender specification should be furnished. Please refer the checklist. The details so furnished by bidder should be complete in all respects and as per formats specified in tender specification.

5. Clarification on tender specification if any, may be obtained by the bidder before submitting the offers

6. Offers must be submitted without any deviation, after seeking clarification, if any.

7. Offers received with any deviation or without relevant information as described above are liable to be rejected. Price bids received in the form other than specified in part-II (price bid) are liable to be rejected.

8. **Bidder shall note that their offer will be considered subject to the approval of BHEL'S customer.**

PROJECT INFORMATION				
1.00	**General**			
1.01	Project Authority		:	**Monnet Ispat Ltd.**
1.02	Name of Project		:	**Monnet Ispat Limited** (Raigarh Sponge Iron Project) Village: Naharpalli Tehsil: Kharsia Dist.: Raigarh-496 001 Chhattisgarh
1.03	Location		:	The Plant site is about 22 km from Raigarh on National Highway No.200 towards Bilaspur
1.04	Nearest Railway Station		:	The nearest railway station is Bhopdeopur on the South Eastern Railway main line.
1.05	Geographical Location		:	$21^0$55'36" N Latitude
				$83^0$20'32" E Longitude
2.00	**Site Conditions**			
2.01	Climate		:	Tropical, region with very hot summer and cool winters. Average annual rain fall 1650.0 mm
2.02	Altitude		:	255 m (average) above Mean Sea Level (MSL)
2.03	Ambient Temperature (dry blb)		:	
	a.	Daily minimum (mean)	:	21.5^0C
	b.	Daily maximum (mean)	:	33.5^0C
	c.	Design ambient temp. for Electrical Equipment	:	50^0C
2.04	Relative Humidity		:	
	a.	High	:	88
	b.	Low	:	19
2.05	Rainfall			
	a.	Average per annum	:	1650.0 mm
	b.	Tropical monsoon	:	June to September
2.06	Heaviest rain fall in 24 hours		:	507.7 mm

PROJECT INFORMATION			
2.07	Wind Velocity		1. 10 – 15 km/hr 45 days /year 2. 15 – 22 km/hr 135 days/year 3. 22 – 29 km/hr 180 days/year
2.08	Maximum Wind Velocity		63 km/hr
2.09	Water Source	:	The make-up water requirement shall be met from River Mahanadi.
2.09	Water table		• Water table during summer is around 30 to 35m below NGL. • Water table during rains is around 10 to 15m below NGL.
2.10	Seismic	:	The area for the proposed power plant lies in Zone III of Seismic Zoning Map of Indian Standard ISS: 1893-1984 and the importance factor is 1.50.
2.11	Bearing Capacity		Net Safe bearing capacity as 25 t/m^2 at 3 meters below ground level.

Bidders are advised to personally visit the project site and acquaint themselves with site location and working conditions prior to submission of their offer. No claim for compensation will be entertained on the grounds of non-familiarity with the site condition & working conditions etc. No claim for compensation will be entertained on the grounds of non-familiarity with the site condition & working conditions etc.

CHECKLIST				
Vide Para 1.3 of Section -I of general conditions of contract				
1	Name of the bidder with Postal Address for correspondence			
2	Name of Contact Person with Telephone No. Fax No., E-mail address	Mr/Ms Tel No. Fax No. e-mail address		
3	Nature of the firm	Proprietary / Partnership / Limited Company		
4	Details of EMD Please indicate whether 1. One Time EMD , or, 2. Only for this Tender	DD No. DD date Name of Bank Amount in Rs.		
5	Validity of Offer (BHEL's Requirement: 180 days from due date)	Validity ----------days		
6	Mobilization time (Please refer Section 11 of SCC)	Mobilization Time ----------		
7	Whether any condition stipulated	**Yes** (vide documents reference:		No
		Bidder to note that tender with conditions unacceptable to BHEL shall be rejected.		
8	Bidder has visited the project site and acquainted with the site conditions		Yes	No
10	Details of concurrent jobs are furnished (as per **Appendix- VII**)		Yes	No
11	Head Quarter's Organization is furnished		Yes	No
12	Proposed site Organization is furnished		Yes	No
13	Names and particulars of Directors /Partners are furnished		Yes	No
14	Financial status of the company (**Annexure 'A' of GCC**) is furnished		Yes	No
15	**Audited Profit & Loss Account** for preceding three years authenticated by Bidder's **Chartered Accountants** is furnished		Yes	No
16	Latest certificate from the **banker about BG and OD Limits** is furnished (Certificate shall not be older than six months from the Last Date for offer submission)		Yes	No

CHECKLIST			
Vide Para 1.3 of Section -I of general conditions of contract			
17	Copy of **IT Return of last three** financial years along with Copy of **PAN** Card are furnished	Yes	No
18	Month wise **Manpower deployment plan** (**Appendix –V**) is furnished	Yes	No
19	Month wise deployment plan for **major T&P** (**Appendix-VI**) is furnished	Yes	No
20	Analysis of **Unit Rates (Appendix – IV)** quoted is furnished.	Yes	No
20	Whether all the pages of the tender documents are **read, understood** and signed	Yes	No
21	**Power of attorney** Enclosed in favour of person making offer.	Yes	No
22	Bidder has familiarized himself with all Relevant local laws & Conditions.	Yes	No
23	Safety Requirement of the works in a Running plant premises have been understood.	Yes	No
24	Erection and Commissioning Programme furnished.	Yes	No
25	**List of jobs completed** (**Appendix – VIII**) in last seven years is furnishes.		
26	Whether **copies of detailed Work Orders (with Scope and BOQ)** and **Completion Certificates** in support of above furnished	Yes	No
27	Whether contractor has left any job unfinished? If so, give reasons.	Yes	No
28	Whether any client has terminated the contractor's work before completion? If so, furnish reasons for the same	Yes	No

Note: strike off yes or no, as applicable

Date: Signature of Bidder

Declaration by Bidder's Authorized Signatory

I ……hereby certify that all the information and data furnished by me with regard to this Tender Specification No. **BHE/PW/PUR/MONTI-CLE/481** is true and complete to the best of my knowledge. I have gone through the specification, conditions and stipulations in detail and agree to comply with the requirements and intent of the specification. I further certify that I am duly authorized representative of the under mentioned bidder and a valid power of attorney to this effect is also enclosed.

Bidder's name and address

Authorised representative's signature with name and address

Date:

CERTIFICATE OF NO-DEVIATION

TENDER SPECIFICATION No. BHE/PW/PUR/MONTI-CLE/481

I/WE, M/s ……

HEREBY CERTIFY THAT NOTWITHSTANDING ANY CONTRARY INDICATIONS/ CONDITIONS ELSEWHERE IN OUR OFFER DOCUMENTS, I/WE HAVE NEITHER SET ANY TERMS AND CONDITIONS NOR THERE IS ANY DEVIATION TAKEN FROM THE CONDITIONS OF BHEL'S TENDER SPECIFICATIONS, EITHER TECHNICAL OR COMMERCIAL, AND I/WE AGREE TO ALL THE TERMS AND CONDITIONS MENTIONED IN BHEL'S TENDER SPECIFICATION WITH ASSOCIATED AMENDMENTS AND CLARIFICATIONS.

Signature of the Bidder

Date:

Section-3

Offer of the Bidder

To,
The DGM (Purchase)
Bharat Heavy Electricals Limited
Power Sector - Western Region
Shree Mohini Complex
345, Kingsway
Nagpur 440 001

Dear Sir,

I/we hereby offer to carry out the work detailed in tender specification No. BHE/PW/PUR/MONTI-CLE/481 issued by Bharat Heavy Electricals Limited, Power Sector-Western Region, Nagpur, in accordance with the terms and conditions thereof.

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

1. Instructions to bidders
2. General conditions of contract
3. Special conditions of contract
4. Other sections, appendices, schedules and drawings.

I/we have deposited/forwarded herewith the Earnest Money Deposit (EMD) as stipulated in Section-15, Special Conditions of Contract, details of which is furnished in the checklist. EMD shall be refunded should our offer not be accepted / EMD **need not be refunded and the amount may be treated as "one time EMD" for erection and commissioning tenders of BHEL-PSWR, Nagpur**. Should our offer be accepted, i/we further agree to deposit security deposit for the work as provided for in the tender specification within the stipulated time as may be indicated by BHEL, Power Sector-Western Region, Nagpur.

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

Place: Signature of bidder:
Date: address:

Witnesses with their address

	Signature	Name	Address
1.			
2			

Section -4

SPECIAL CONDITIONS OF CONTRACT

11.0 GENERAL

The work under these specifications broadly covers the complete work of handling at storage yard/stores, transportation up to work site, calibration, pre-assembly, erection, testing, pre-commissioning checks, assistance for commissioning, final painting and handing over of Electrical and Control & Instrumentation of the following:

D) 2x45 MW Steam Turbine, Generator and their Auxiliaries.

Scope of work is further detailed in various clauses hereafter.

4.1 General Requirements – Common to all Packages

4.1.1
The intent of specification is to provide services according to the most modern and proven techniques and codes. The omission of specific reference to any method, equipment or material necessary for proper and efficient execution of this work shall not relieve the contractor of the responsibility of providing such facilities to complete the work without any extra compensation.

4.1.2
The terminal points decided by BHEL should be final and binding on the contractor for deciding the scope of work and effecting payment for the work done.

4.1.3
The work shall be executed under the usual conditions affecting major power plant construction and in conjunction with numerous other operations at site. The contractor and his personnel shall cooperate with personnel of BHEL, BHEL's customer, customer's consultants and other contractors, coordinating his work with others and proceed in a manner that shall not delay or hinder the progress of work of the project as a whole.

4.1.4
The work covered under this specification is of highly sophisticated nature, requiring the best quality workmanship, supervision, engineering and construction management. The contractor should ensure proper planning and successful & timely completion of the work to meet the overall project schedule. The contractor must deploy adequate quantity of tools & plants, modern / latest construction aids etc. He must also deploy adequate trained, qualified and experienced supervisory staff and skilled personnel.

4.1.5
Contractor shall erect, align and commission all the equipments and auxiliaries as per the sequence & methodology prescribed by BHEL depending upon the technical requirements. Availability of materials and fronts will decide this. BHEL engineer's decision regarding correctness of the work and method of working shall be final and binding on the contractor. No claims for extra payment from the contractor will be entertained on the ground of deviation from the methods / sequences adopted in erection of similar sets elsewhere.

4.1.6
All necessary certificates and licenses, permits & clearances required to carry out this work from the respective statutory authorities are to be arranged by the contractor at his cost in time to ensure smooth progress of work.

4.1.7
The work shall conform to dimensions and tolerances specified in the various drawings / documents that will be provided during various stages of erection. If any portion of work is found to be defective in workmanship, not conforming to drawings or other stipulations due to contractor's fault, the contractor shall dismantle and re-do the work duly replacing the defective materials at his cost, failing which the work will be got done by BHEL and recoveries will be effected from the contractor's bills towards expenditure incurred including cost of materials and departmental overheads of BHEL.

4.1.8
All necessary certificates and licenses required for carrying out this work are to be arranged by the contractor expeditiously.

4.1.9
The contractor shall execute the work in the most substantial and workmanlike manner. The stores shall be handled with care and diligence.

4.1.10
BHEL reserves right to recover from the contractor any loss, which arises out of undue delay/discrepancy/shortage/damage, or any other causes due to contractor's lapse during any stage of work. Any loss to BHEL due to contractor's lapse shall have to be made good by the contractor.

4.1.11
All transport equipment, handling equipment, tools, tackles, fixtures, equipment, materials, manpower, supervisors/engineers, consumables etc., except otherwise specified as BHEL scope of free issue, required for this scope of work shall be provided by the contractor. All expenditure including taxes and incidentals in this connection will have to be borne by him unless otherwise specified in the relevant clauses. The contractor's quoted rates should be inclusive of all such contingencies.

4.1.12
During the course of erection, testing and commissioning certain rework / modification / rectification / repair / fabrication etc., may become necessary on account of feedback / revision of drawing. This will also include modifications / re-works suggested by BHEL / customer / other inspection group. Contractor shall carry out such rework / modification / rectification / fabrication / repair etc., promptly and expeditiously. Daily log sheets signed by BHEL engineer and indicating the details of work carried out, man-hours etc. Shall be maintained by the contractor for such reworks. Claim of contractor if any, for such works will be governed by clauses 13.1 to 13.8.

4.1.13
All works such as cleaning, leveling, aligning, trial assembly, dismantling of certain equipments/components for checking and cleaning, surface preparation, fabrication of sheets, tubes and pipes as per general engineering practice and as per BHEL engineer's instructions at site, cutting, gouging, weld depositing, grinding, straightening, chamfering, filing, chipping, drilling, reaming, scrapping, lapping, fitting up etc., as may be applicable in such erection works and which are treated incidental to the erection works and necessary to complete the work satisfactorily, shall be carried out by the contractor as part of the work within the quoted rates.

4.1.14
The contractor shall make all fixtures, temporary supports, steel structures required for jigs & fixtures, anchors for load and guide pulleys required for the work (excepting those specifically included in BHEL scope). However, necessary steel will be provided from the scrap / surplus materials available at site.

4.1.15
The contractor shall take delivery of the components, equipments, chemicals, lubricants etc from the BHEL stores/ storage area after getting the approval of BHEL engineer on standard indent forms of BHEL. Complete and detailed account of the materials and equipments after usage shall be submitted to the BHEL and reconciled periodically.

4.1.16
Contractor shall plan and transport equipments, components from storage to erection site and erect them in such a manner and sequence that material accumulation at site does not lead to congestion at site of work. Materials shall be stacked neatly, preserved and stored in the contractor's shed and at work areas in an orderly manner. In case it is necessary to shift and re-stack the materials kept at work areas/ site to enable other agencies to carry out their work or for any other reason, contractor shall do it most expeditiously. No claim for extra payment for such work will be entertained.

4.1.17
Plant materials should not be used for any temporary supports / scaffolding / preparing pre - assembly bed etc.

4.1.18
The contractor shall perform any services, tests etc. which may not be specified but nevertheless required for the completion of work within quoted rates.

4.2 WELDING, NON-DESTRUCTIVE TESTING ETC.

A) Installation of equipment involves good quality welding, NDE checks etc.

B)

1) Welding of high pressure joints shall be done by IBR certified high pressure welders who have been permitted by CIB of concerned state for deployment at site of work.
2) Welding of all attachments to pressure parts, piping shall be done only by the qualified and approved welders.

C) All the welders (structural and high pressure) shall be tested and approved by BHEL engineer before they are actually engaged on work though they may possess the IBR/other certificate. BHEL reserves the right to reject any welder without assigning any reason.

D) The welded surface shall be cleaned of slag, surface dirt, rust etc. and painted with ROZC primer (IS:2074) and synthetic enamel finish paint (IS:2932) to prevent corrosion. For this primer and paint shall be in contractor's scope.

D) Welding electrodes shall be procured only from the list of BHEL -approved brands/manufacturers. Welding electrodes shall have to be stored in controlled atmosphere as per recommended procedures of the concerned electrode manufacturer. Contractor shall obtain copy of manufacturing batch test certificates of the electrode manufacturer for each batch and submit to BHEL before using the electrodes.

E) Welding electrodes, prior to their use, call for baking for specified period at specific temperature as per recommendation of the manufacturer. Also, during execution, the welding electrodes have to be kept in portable ovens. Contractor shall arrange all such baking and holding ovens.

4.3 TESTING, PRE-COMMISSIONING AND ASSISTANCE FOR COMMISSIONING:

4.3.1
Testing, pre-commissioning, & Assistance for commissioning will involve, though not limited to these: setting/adjusting, testing, proving, trial runs, etc. Of various equipments and systems installed. All the activities for commissioning of the set, as informed by BHEL from time to time shall be completed.

4.3.2
All the above tests should be repeated till all the equipments satisfy the requirement/ obligations of BHEL to their client and also the relevant statutory authority.

4.3.3
The contractor shall immediately attend to the defect noticed during tests, trial runs, pre-commissioning, commissioning such as loose components, undue noise or vibration, strain on connected equipment etc. Readjustment and realignment as called for shall be done as per BHEL's instructions. Claim, if any, for these works from the contractor shall be governed by clauses 13.1 to 13.8.

4.3.4

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

II) Similarly, during the course of erection, if certain portion of equipment's erected by the contractor has to be undone for enabling other contractors/ agencies of BHEL/customer to carry out their work, contractor shall carry out such jobs expeditiously and promptly and make good the job after completion of work by other contractor's/ agencies of BHEL/customer as per BHEL engineer's/agencies of BHEL/customers instructions. Claims, if any, in this regard shall be governed as per clauses 13.1 to 13.8.

III) Certain instruments may have to be installed temporarily/ in temporary installations for specific requirements. Contractor shall install, after due calibration if required, such instruments for which payment shall be regulated as per respective item rates. Contractor shall remove these instruments and return to BHEL/client's stores after the use. No separate payment will be made for installation, removal and returning of such instruments.

4.3.5
The testing/calibration/commissioning activities shall start prior to synchronization of STG sets. The contractor shall provide adequate manpower, including supervision of required skill level in various area of work with necessary consumables, tools and tackles etc., as part of commissioning assistance till handing over of the unit to BHEL's customer.

4.3.6
It shall be specifically noted that the contractor may have to work round the clock during the pre-commissioning and Assistance for commissioning period alongwith or without BHEL engineers and hence considerable overtime payment is involved. The contractor's quoted rates shall be inclusive of all these factors.

4.3.7
The contractor shall carry out any other tests as desired by BHEL engineer on erected equipment covered under the scope of this contract during testing, pre-commissioning and commissioning, to demonstrate the completion of any part or whole of work performed by the contractor.

4.3.8
During this period, though BHEL/ client's staff will also be associated in the work, the contractor's responsibility will be to arrange for complete requirement of men and required

tools and plants, consumables, scaffolding and approaches etc., till such time the commissioned unit is taken over for trial operations.

4.4 GENERAL RESPONSIBILITY OF THE CONTRACTOR

The contractor shall have total responsibility for all equipment and materials in his custody at contractor's stores, loose, semi-assembled, assembled or erected by him at site. He shall effectively protect the finished works from action of weather and from damages or defacement and shall also cover the finished parts immediately on completion of work as per BHEL engineer's instructions. The machine surfaces/finished surfaces should be greased and covered.

4.4.1
At all stages of work, equipments/materials in the custody of contractor, including those erected, will have to be preserved as per the instructions of BHEL.

4.4.2
The contractor shall make suitable security arrangements including employment of security personnel and ensure protection of all materials/ equipment in their custody and installed equipments from theft/fire/pilferage and any other damages and losses.

4.4.3
Contractor shall collect all scrap materials periodically from various area of work site, deposit the same at one place earmarked at site or shift the same to a place earmarked in BHEL/ client's stores. In case of failure of contractor in compliance of this requirement, BHEL will make suitable arrangement at contractor's risk and cost.

4.4.4
The entire surplus, damaged, unused materials, packaging materials / containers, special transporting frames, gunny bags, etc., shall be returned to BHEL stores by the contractor.

4.4.5
The contractor shall not waste any materials issued to him. In case it is observed at any stage that the wastage/excess utilization of materials is not within the permissible limits, recovery for the excess quantity used or wasted will be effected with departmental charges from the contractor. Decision of BHEL on this will be final and binding on the contractor.

4.4.6
For any class of work for which no specifications have been laid down in these specifications, work shall be executed as per the instructions of BHEL.

4.5 WASTAGE ALLOWANCE

The erection contractor shall make every effort to minimize wastage during erection work. In any case, the wastage shall not exceed the following limits:

S.No.	Item	% Wastage on net issued Qty
i)	Each size of power cables HT/LT	1
ii)	Each size of control /Signal cables	2
iii)	Each size of impulse pipe	2

a) For all payment purposes, measurement shall be made on the basis of the execution in accordance with drawings / physical measurements. Physical measurements shall be made by the contractor in the presence of the Engineer.

b) All the surplus, scrap and serviceable materials, left over after work completion out of the quantity issued to the contractor shall be returned to BHEL in good condition and as directed by the engineer.

c) All materials returned to stores should be tagged with aluminium tag indicating the size and type. More than 5 meters length termed as serviceable material and shall be returned size-wise and category wise to the owner's stores/yard. Cable of serviceable length being returned to the stores in drums shall have their free ends sealed and the balance lengths on the drum(s) shall be noted and certified by BHEL Engineer-in-charge. This shall be applicable only for the purpose of accounting the cables issued for installation.

d) While carrying out material appropriation with contractor, all the above points will be taken into account. All serviceable material returned by the contractor shall be deducted from the quantities issued for the respective sizes and categories and the balance quantity (ies) will be taken as the net quantity (ies) issued to the contractor. Material appropriation shall be done and allowable scrap quantity calculated as per wastage allowance percentage specified above. Any scrap/wastage generated by the contractor in excess of the allowable percentage shall be charged at the rates decided by the Engineer whose decision shall be final and binding on the contractor.

e) Every month the contractor shall submit an account for all the materials issued to him by BHEL in the standard proforma prescribed for this purpose by the site in charge.

f) Cutting and wastage allowance shall be computed on the lengths and weight of materials actually used, measured and accepted.

g) If the actual wastage is more than the specified figure, then equivalent cost of the excess portion will be deducted from the contractor's bill.

h) Cable take off from drums shall be planned strategically such that jointing in the run of cables and wastage are avoided. For this purpose the exact route length between various equipment/panels as per the cable schedule shall be measured and the route length recorded before laying of the cables. Depending upon the route length the type of cable required for various destinations, the cable drums should be suitably selected for cable laying. Jointing, if any should be done with prior approval of BHEL engineer. All the cut pieces/bits of cables, which are not used/unused, shall be returned to the purchaser for accounting towards wastage. The cables damaged by the contractor shall have to be replaced by the contractor at his own cost.

NOTE:

I) Salvageable scrap shall mean left over lengths of pipes, multi-core cables, other cables etc., that can be used at a later date for similar intended purpose.

ii) Non-Salvageable scrap shall mean left over lengths of tubes, pipes, multi-core cables, other cables etc. that cannot be used for any installation purpose.

4.6
For any items or class of work not specified herein but required for total completion of overall work in scope herein, the same shall be carried out by the contractor. Payment of these items/class of work shall be regulated on the basis of rate arrived at by either of the following methods:

A) Based on rate of identical/similar items in the rate schedule.

B) Based on the rate arrived from nearest comparable item in the rate schedule.

C) Wherever any item rate for similar type of work or comparable item rate does not exist in the rate schedule, rate will be worked out on the basis of work element or from fundamentals of estimation. BHEL's decision in this regard shall be binding and final in this regard.

Contractor shall provide necessary resources for completion of such work within the stipulated time schedule. Value of such work shall be included while computing the total value of work finally executed for all contractual purposes, particularly for contract variation purpose.

4.7 The contractor's scope of work is further described in the clauses hereafter:

The work will comprise of, but not limited to the following:

4.7.1 INSTALLATION OF PANELS AND HT/LT SWITCHGEAR

A. Electrical control panels, electronic control panels, HT/LT switchgear, 415 volt LT MCC, are normally supplied in suit of either one/two/three or loose shipping sections with integral base frame or loose base frame. These panels may have to be installed as stand alone or in group consisting of number of panels in each row, depending upon the plant layout and foundation arrangement.

B. The panels shall be transported from stores to the place of installation in vertical position. Care shall be taken such that the switches, lamps, instruments etc. mounted on the panel do not get damaged during transit.

C Installation of panel shall include fixing of base frame, leveling, alignment, fixing of anti-vibration pads, removal of side covers, fixing of cubical interconnection hardware, bus-bar jointing, wiring interconnection, welding and grouting of panels and base frames, mounting of panel canopy wherever supplied as part of panel, drilling of gland plates, sealing of panels/ cable entries. Where the base frame is not supplied as part of panel supply, the contractor shall fabricate the base frame from structural items at site. Payment for such fabrication will be effected on measured quantity at the rate applicable for structural steel fabrication and installation. Special material required for fireproof sealing of the panels shall be supplied by the contractor within the quoted price. Proper sealing of all the holes and cable entries (even if the cable has been laid by others) in the panel is in the contractor's scope.

D Panels have to be shifted to their locations through floor openings, temporary openings like floor grills, door etc. Which shall be a part of work and no claim whatsoever will be entertained with regard to non-availability of opening as per shortest route etc. Panels have to be erected at different locations in STG hall, LT & HT switchgear room, unit control room etc.

E Panel and instruments once erected in position should be properly protected using necessary care to prevent ingress of dust/moisture. This will have to be periodically cleaned and surroundings have to be kept tidy.

F Whenever the panels to be mounted on cable trenches, channel supports have to be provided across the cable trench over which the base frame of panel shall be mounted. For such work, structural steel fabrication & installation rate shall be applicable.

G Normally the panels shall be supplied with meters, relays, electronic modules, contractors, pushbuttons etc mounted and pre-wired. However, if such devices are supplied loose/separately for safety in transit, contractor shall mount the same as part of panel installation work and no extra payment shall be made for this.

H Supplier's instruction manuals, packing slips, door keys etc. Received along with the panels will be handed over to BHEL's engineer on opening of the panels.

I Regular cleaning of the panels as per the instruction of BHEL engineer till handing over of the set to customer is to be carried out by the contractor free of cost.

4.7.2 STRUCTURAL STEEL FABRICATION AND INSTALLATION

A Structural steel material like MS angles, channels, beams, flats, plates etc. Shall be supplied in running meter and the same shall be used for fabrication of panel base frame, cable tray supports, canopies for instruments/panels/ drives/JB/push buttons etc., instrument/junction box frames, impulse pipe/instrument air pipe supports and instruments etc.

B This shall include cutting to size, contouring of ends for connections if required, welding, grinding of excess weld deposits/burrs, drilling of holes for mounting of device/instrument, installation at location, leveling, alignment, providing bracings and painting etc. No gas cut holes will be permitted.

C All the fabricated supports/frames shall be painted as per painting specifications.

D Frame installation at site may involve mounting either on concrete floor by grouting/using anchor fasteners or on steel structure by welding etc. All consumables including anchor fasteners shall be arranged by the contractor. Where required, as part of work, concrete floors may have to be chipped out to reinforcement depth for anchoring the frames. Wherever grouting is required, contractor shall arrange all the required material including cement/grout mix, shuttering etc., necessary labour and meet all other requirements as part of work.

E In certain packages, members of frames/rack for mounting of junction boxes/ instruments may be supplied readymade. These have to be assembled prior to installation. The installation rate as quoted shall include assembly of the frames.

F Gas cutting of tray/impulse pipe support and holes in frame is not permitted. Only hacksaw cutting/ drilled hole shall be permitted.

4.7.3 LAYING OF PIPES/TUBES (IMPULSE PIPE)

A Installation of impulse pipe of CS/AS/SS material shall include cleaning, air flushing, cutting to length from the running meter, edge preparation, cold bending, welding of sockets/ reducers/ tee/ cross/ isolating valves/union nut and nipples/tail pieces etc., mounting of SS/CS three/five valve manifolds and compression fittings, condensate pot/equalizing vessel, providing supports, clamping, conducting leak test/hydraulic pressure test, painting and other accessories as per instrument hook-up diagram. Piping works shall involve either arc or TIG welding.

IBR certified welders shall be deployed for welding of impulse pipe and contractor shall take approval for welder and welding consumables from BHEL site engineer.

B All fittings and accessories for impulse pipe and air line shall be provided by BHEL. Quoted rate for piping shall include cost of installation of such fittings as no separate rate is envisaged.

C **Contractor shall provide GI clamps for impulse pipe and GI pipes within the quoted rate for installation of the same.**

4.7.4 INSTRUMENT & SERVICE AIR PIPING /GI PIPING

GI pipes will be supplied by BHEL in random length with both ends threaded for socket joints. Laying of GI pipe for instrument air line shall include air blowing, cutting from the random length, threading, installation of elbows/tee/ reducer/moisture traps/auto drain pot/check valves/isolating valves, supporting, clamping, including supply of clamp, conducting leak test etc. Threaded joints of air pipeline shall be made leak proof by using teflon tapes or suitable sealing compound. It shall be responsibility of the contractor to ensure healthy threading on the pipes (shop-threaded as well as site threaded) and sockets before taking up jointing of pipe pieces. It may be necessary to clean/rework the thread in shop-threaded pipes. This shall be done within the quoted price. In case any leakage is found in the site joints, contractor shall repair the same by suitable method within the quoted rates.
GI pipes shall be cut only by hack saw/machine cut. No gas-cutting is permitted in these pipes.

4.7.5 COPPER TUBING/PIPE/SS TUBE

Installation of copper tube/SS tube/copper pipe shall include cutting into required length, bending, laying, cleaning, brazing wherever required, fixing of fittings like compression fittings/tees/end-connectors/straight-connectors/bulk heads/valves etc. supporting, clamping including supply of clamps and matching hardware, flushing/blowing and conducting leak test. Suitable tube cutters, benders and de-burring tools shall be arranged by the contractor and used for such jobs.

4.7.6 CABLE TRAYS/CABLE DUCTS

A Various types of sheet metal, galvanized cable tray, i.e. perforated, ladder type, sheet metal duct, solid bottom trays, pre-fabricated structural trays etc., will be supplied in standard lengths along with accessories and hardware viz. coupler plate, tray covers and tray clamps etc.

B Installation of cable tray/cable duct shall include cutting, laying, jointing, fixing tee/reducers/ bends/clamps, fixing of tray covers, hardware, welding of tray supports as per tray route layout etc.

C Fabrication of bends/tee/ reducers from straight length is within the scope of work and rate quoted shall be inclusive of this. All site welds of cable trays shall be painted with approved primer and cold galvanizing paint, which shall be arranged by the contractor.

D In case, structural cable trays, bends, tees, reducers etc., are required to be fabricated from structural steel and installed, unit rate applicable for fabrication and installation of structural steel shall be applicable in such instances.

E Cable trays/duct etc may have to be routed underground in cable trench, overhead on structure, along the walls, floors etc. for various applications.

4.7.7.1 Cable laying (power/control/instrumentation shielded cables/triad cable/ plug-in cables/ UTP cables for Ethernet network / armoured / un-armoured, single/multi-core, PVC/HR PVC /FRLS/Teflon/XLEP insulation)

A **Cable laying will include:**

05) Cutting to the required length, laying in overhead/underground cable trench/ through pipes/flexible conduits. Cable rollers have to be used as per requirement. The contractor shall prepare the drum schedule in order to minimize the wastage.

06) Dressing/clamping in tray etc.

07) Drilling of holes in gland plates in panels and junction boxes for the entry of cable.

08) Cable glanding, splicing, dressing of spliced wire inside the panel and jbs.

09) Providing PVC numerical/alphabetical ferrules. Wherever required ferrules shall be one-piece heat shrinkable type.

10) Termination by using crimp type lugs copper tinned/ aluminium (insulated/ un-insulated).

11) Providing identification cable tags, aluminium at both the ends and at appropriate interval throughout the route length.

12) Continuity checking, insulation resistance checking, high voltage test on HT cables, as applicable.

B Entry to the panels, **JBs** may be from top, side or bottom. All cable shall be supported and clamped near the panels/ JB.

C Wherever cable glanding is not possible, either due to the gland plate size limitations or more number of cable entries, suitable alternative arrangement as specified by BHEL shall be done. Pre-fab plug-in cables, for such cases, cables may have to be lifted inside the panel either making cut-out in gland plate and providing rubber profile for sharp edge protection or alternatively, provide 4/6" PVC pipe coupling gland and these pipes coupling gland shall be supplied by contractor within the quoted rate of cable laying.

D Copper/Aluminum tinned crimp type up to 4 sq. mm. size lugs of various type (pin, ring, fork, snap-on), PVC cable ties, PVC ferrules, PVC buttons and tapes, cable identification tag of metallic, clamping and dressing material with hardware, PVC sleeves etc. Shall be supplied by the contractor within the quoted rate for cable laying. The quality of material shall be got approved from BHEL engineer prior to their procurement.

E All care should be taken to avoid abrasion, tension, twisting, kinking, stretching of cables during installation.

F Cable shielding – all signal cables are supplied with bare shielded copper wire/with breaded wire shield, generally sealed wire is kept isolated at instrument/field device end and continuity is maintained through JBs and getting earth at panel end only. While terminated the sealed wire either in panel or JBs, PVC sleeves is to be used to avoid two-point earthing. Supply of PVC sleeves of appropriate colour is in contractor's scope.

G Wherever cable ducts/tray, conduits pass through fire barriers such as walls, floors etc., the openings/ passage shall be sealed using fireproof/ weatherproof sealing compound. Similarly cable entry in panels, MCC/LT/ HT breakers, instruments, electrical actuators etc are also required to be sealed. These shall be done as per the specifications of BHEL. Required consumable shall be in contractor scope of supply within quoted rate for cab ling.

H Normally, cables glands on junction boxes side are received mounted. While terminating the cables as per drawings, the cable glands to be removed and fixed. Wherever cable glands are not received along with junction boxes, no separate

payment will be made for fixing the cable glands to the junction boxes including drilling of holes.

J For single core HT power cable BHEL will provide the trefoil clamps.

K Many of the cables may have to be laid in the cable trenches. For this purpose, the cover of trenches has to be opened for working inside. All safety precautions have to be observed while laying the cables in the trench. After completing the work, the trench has to be cleaned and covers put back into position. The contractor, if required, shall do de-watering of trenches.

L **TERMINATIONS:**

The types of cable terminations are as detailed below:

1) Power cable : Crimping hydraulic/manual
2) Control cable : Manual crimping
3) Crimped/soldered plug-in-type
6) Screwed type.
7) All console devices / computer peripherals shall be screwed, crimped, soldered plug in type.

The contractor shall arrange for special tools and skilled manpower required for any type of cable as mentioned above. Additionally ferrule printing machine for printing of sleeved ferrules of various sizes will also be arranged by the contractor.

4.7.7.1 **BUS DUCT**

GENERAL DESCRIPTION

1. Generator isolated bus duct is connected to low voltage side of Generator transformers and main bus duct shall have tee off connection for unit transformer, LAVT cubicles, excitation transformer and air pressurization equipment. Bus duct consist of round / octagonal/ box hollow aluminium alloy conductor and supported inside aluminium enclosure with post insulator. Flexible connections and expansion joints are provided at terminals and intermediate point to alleviate stresses. Ring type protection current transformer will be mounted inside the bus duct.

2. Bus duct shall have tap connection for potential transformer, surge protector etc. housed in a metal clad cubicle, UAT and NG cubicle/ resistor cubicle. Various electrical tests have to be performed before and after erection.

3. Bus duct enclosure /conductor is a continuous welded type. Conductor, enclosure, makeup pieces, shunts pieces etc have to be welded at site.

4. The scope of for Isolated Phase Bus Duct shall include Transportation of material from stores/ storage yard, preparatory work such as erection of supporting structure, placement of sub assemblies / equipments, alignment, edge preparation of conductor / enclosure, welding of conductor / enclosure, welding of shunt pieces & make up pieces, installation of seal of bushing & wall frame assemblies, shorting links, earthing, LAVT cubicle, copper flexibles, copper rubber bellows, weldable/ bolted flexibles, installation of air pressurising unit and its associated piping work and cable etc, testing and commissioning.

5. Pre-fabricated G.I. supporting members shall be supplied loose and to be erected as per lay out drawing. Foundation pockets and embedded plate inserts shall be provided as per lay out drawing (on floor for bottom support and on bottom of concrete slabs). Contractor shall weld the supports on insert plate and shall carry out grouting including supply of grout materials after complete alignment/bolting of structural members. If any modifications are required in supporting structure due to site conditions, the same shall

be carried out without any extra cost. All welded joints shall be applied cold galvanizing zinc paint (paint in the scope of the contractor).

6. Required aluminium welding of conductor, enclosures, shunt, make up pieces, aluminium flexible etc as detailed in drawings has to be carried out by contractor. MIG welding shall be applicable. Contractor shall arrange necessary welding equipment/ accessory in sufficient number, filler wire, argon gas and other required consumables at his cost.

7. During erection of bus duct/enclosure, makeup pieces and shunts, if any modifications are needed to match the alignment, they shall be part of work and no extra payment shall be made.

8. All bolted joints and flanges shall be tightened with torque wrench to the approved torque. Wherever bolted joints, the same shall be cleaned and a layer of anti-oxidation paint shall be applied. Such paints etc will be arranged by the contractor within the quoted rates.
9. Top chamber/adapter box for line and neutral side, hood assembly at UT, hood assembly at excitation transformer and at LAVT cubicle end shall have drilled hole in flange. If there is any mismatch of the hole in above with respect to the counter flange / welded studs provided on UAT, LAVT and excitation cubicle, the contractor shall drill new holes if required within the quoted rates.

10. Proper sequence shall be followed during erection to avoid any mismatch and alignment problem.

11. Prior to installation of bus duct assemblies in position, the various component like conductor, insulator shall be inspected and cleaned and insulation resistance to be measured and recorded. If any insulator found damaged, the same shall be replaced.

12. Electrical test on current transformers and potential transformers shall have to be carried out prior to installation & during pre-commissioning. The tests are insulation resistance measurement, winding resistance, magnetisation characteristic, ratio test, water ingress and air leak test on assembled bus- ducts.

13. Minor civil work such as chipping, levelling of foundation, providing pockets, drilling/enlargement of holes in structure, bus bar etc. which are incidental to the erection of bus duct shall not be treated as extra.

14. All miscellaneous items such as disconnecting links, flexibles, shorting bars, hardwares, conduit for wiring, marshalling box, CTs and PTs wiring through conduit, earthing materials, bus bar fish plates etc. are part of bus duct installation. Hence separate break-up quantity is not given in BOQ.

15. Round makeup pieces for main and tee off duct shall be supplied in two halves and it involves both circumferential and horizontal welding at parting plain.

16. Air tightness and water tightness test have to be carried out on completion of bus duct installation. In case of any leakages, contractor has to rectify and bring to the required level of air tightness/water tightness without any extra cost.

17. High voltage test of bus duct is to be carried out as per the instruction of BHEL engineer. Contractor shall arrange necessary test equipment/ instrument for conducting various electrical tests at his own cost.

18. Contractor has to carry out final painting as per standard cobur coat recommended by BHEL. Paints and consumables shall be in contractor's scope.

19. Shunt pieces shall be supplied in two halves and to be welded between two-phase bus duct at transformer end. The shunt pieces to be welded on both the side on matching plain and bus duct circumference and horizontal plain.

20. Contractor shall conduct 20 % radiography and 100% NDT test on welded joints.

21. Any enclosed drawings are for estimation and tendering purpose only. Contractor has to ascertain quantum of work involved. The BOQ as furnished in this tender specification for Isolated Phase Bus Duct & Segregated Phase Bus Duct are tentative / approximate. **Contractor has to ascertain the quantum of work involved and quote the lump sum value, as called in the rate schedule, without any additional compensation for any variation in length or numbers of joints.**

22. One end of the enclosure to be earthed to the station earth at shunt location where all three-phase enclosure are shorted. Wherever shunts are not provided, each phase should be earthed separately.

23. In case of bolted bus-ducts, phase split covers, rubber bellows, clamping earth straps to be connected to maintain the electrical continuity and in turn enclosure gets earthed at one point.

24. All other equipment such as LAVT, NG transformer/ resistor cubicle, air pressurization, CT chambers, junction boxes, etc to be earthed at two points to the earth grid.

1.1.1 FIELD INSTRUMENTATION

A Various type of primary/secondary/ indicating/ recording instrument for pressure, temperature, flow, level, speed, turbo supervisory and analytical measurement shall be supplied either loose or mounted alongwith the equipment.

B Scope of work under calibration, erection// testing/ Assistance for commissioning shall include calibration, setting, adjustment, supply and fixing of instrument tag plates, hardware as specified by BHEL, report making, installation, servicing, minor repairs, putting instrument into service, signal checking from field upto the functional group panels and remote indicating/ recording instrument, functional checks, interlock and protection/alarm checks by simulating the field devices, providing assistance for trouble shooting during pre-commissioning/ commissioning and till the unit is handed over to the customer.

C Contractor shall establish calibration laboratory with adequate facilities and they should arrange standard test instruments duly calibrated from the agencies approved by BHEL. Calibration report of the same should be submitted prior to start of calibration of the field instruments/devices.

D It is the responsibility of contractor to make erection, calibration/ testing and commissioning protocols for various equipments/devices installed by them and they should get duly certified by customer/BHEL engineer and should be submitted to BHEL engineer regularly.

E 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.

F For such of those instruments/devices such as temperature gauge/ switches, pressure gauge/switches, transmitter pressure/flow/ level/DP, level probe/switch etc, which are received, assembled with mechanical equipments and are to be calibrated, only calibration rate will be paid as per applicable rate for respective

instruments/devices. No payments shall be made for removal and re-fixing of such instruments.

G If performance of any instrument found unsatisfactory once put into operation, during functional check and integration of control / monitoring of system / control loop, contractor shall re-calibrate such instrument and no extra payment shall be made for re-calibration.

H Installation of thermowells and seal welding of the same is in contractor's scope. However, installation of root valves is not in the contractor's scope.

4.7.10
INTEGRATED ELECTRICAL TESTING/ ASSISTANCE FOR COMMISSIONING OF GENERATOR CONTROLS AND PROTECTIONS RELAY PANELS & ASSOCIATED EQUIPMENTS.

4.7.10.1

Integrated electrical testing/Assistance for commissioning of Generator Control panel and Relay & Protection Panels (Refer relevant entries under "Panels" in Rate schedule) and associated equipment shall involve various activities like relay testing/setting, simulation checks, testing of energy meters, on/off line functional checks on integrated system.

The brief scope of work is defined as below, but not limited to the following:

A) Relay Testing in static condition for Generator, Transformers, and associated system by secondary current injection at different current and recording the time duration.

B) Testing and checking of control and protection interlock scheme in static condition and simulation of protection device contact from internal and external devices.

C) Measurement of Insulations, Winding Resistance, Polarization Index of winding of Generator & associated equipment/ system

D) Relay setting and checking the stability of protection relays in static and dynamic condition during the OCC (Open Circuit Characteristic) & SCC (Short Circuit Characteristic)

E) Functional checks / testing of synchronizing schemes during the static and dynamic by simulation / back charging of generator transformer conditions.

F) Monitoring & recording the various parameters during open circuit and short circuit conditions test on generator & associated field equipment like generator transformer, unit auxiliary transformer. Recording and monitoring measurement.

G) Testing of protection current transformer for ratio test by primary injection, magnetization characteristic, polarity test, and IR measurement. Functional checks of relays of protection system by primary injection.

H) Testing of potential transformer for ratio test by voltage ratio, polarity test, insulation resistance measurement etc, testing of surge capacitors, PT isolator in PTPS cubicle etc. (Theses are housed in Generator side line & Neutral Cubicle).

I) Testing & Assistance for commissioning Generator Circuit breaker.

J) High Voltage test on inter connecting cable between generator and line/ neutral side cubicle.

K) Testing of relays, meters, and internal devices, functional checks of electrical panels LT MCC, HT breakers and other panels / equipments.

L) HT Test on bus duct bus bar, resistance measurement etc.

M) Contractor shall discuss & finalize testing procedure with BHEL Engineer In-Charge for the test to be conducted on Generator Control & Relay Panel testing. Drawing & documents shall be provided by BHEL at the time of testing. BHEL decision in this regard shall be final and biding on the contractor.

N) Checking & testing of Neutral Grounding transformer & resistor.

O) Compilation of test records.

In case Contractor has not done similar work, they are free to tie –up with the experienced agency who has carried out similar nature of work and having adequate resources i.e. experienced manpower, T&Ps / testing/ measuring instruments. Contractor shall submit documents in support of such tie –up arrangement of such parties along with the offer. Credential of such parties shall be submitted with technical bid along with tie-up MOU.

4.7.11

MISC.OTHER INSTRUMENT/EQUIPMENT CALIBRATION, ERECTION, TESTING, AND ASSISTANCE FOR COMMISSIONING.

A Contractor shall carry out testing & Assistance for commissioning of panels, electrically operated valves, pneumatic control valves, pneumatic trip valves, solenoid valves, limit switches, HT/LT motors including drying out, and any other integral devices forming part of various mechanical skids/equipments, & piping etc.

B The scope of Assistance for commissioning of electrically operated actuators for valves, dampers, gates etc., will include meggering, adjustments of mechanical/ electrical or electronic position transmitters, setting of limit/torque switches, cable checking, internal wiring checking, local/remote operation, replacement of limit/torque switches if required.

C The scope of Assistance for commissioning of devices like solenoid valves, feedback position transmitter, limit switches, air filter regulator, airlock relay, positioner etc. Which are integral part of pneumatic control valves/ power cylinder/ trip valves etc. and electrically operated valve will involve adjustments/servicing, calibration etc. As incidental to work, contractor shall remove such devices prior to erection either at site or at store to avoid damage/pilferage and for keeping in safe custody. These shall be installed at appropriate stage as instructed by BHEL

D Whenever additional instrumentation work viz. gauges, transmitters, temperature elements, is to be carried out for performance guarantee test, the same has to be executed by the contractor as per the rate applicable already provided in the rate schedule.

E Certain instrumentation like pressure switches, pressure gauges, dial thermometers, transmitters etc. Are received in assembled condition as integral part of equipments. Dismounting, calibration, and re-erection of such instruments, where required for safe keeping or any other purpose as instructed by engineer, is in the scope of work. **Only the rate applicable for calibration for respective instrument item will be paid.**

4.7.12 **CALIBRATION, TESTING & ASSISTANCE FOR COMMISSIONING**

Calibration, testing & Assistance for commissioning activity as specified in this technical specification and rate schedule against various equipments, devices, systems etc. are broadly described hereunder. However, there may be some overlapping between these activities. The classification of each activity is only a broad guideline for understanding the nature and volume of work in scope. The contractor shall not make any additional/extra claim for performing or providing manpower assistance for such overlapping work, which is also within the scope of work.

A **CALIBRATION**

1. Verification of instruments for range, type etc; with respect to instrument schedule, data sheet or system document.
2. Codification of instruments as per system tag numbers
3. Calibration/adjustment of instrument as per system requirement/set values.
4. Providing head correction in case of pressure measuring instruments.
5. Verification of installation of instruments for range, type, tag number as per physical location of process point as per process, instrumentation diagram.
6. Checking and ensuring the proper functioning of instruments.
7. All the recorders shall be made functional with proper chart movement and ink marking.
8. Preparation of records for calibration, erection and commissioning etc.

B **ERECTION**

1. Drawl of material from store, verification and inspection as per shipping list, drawings and documents.
2. Preservation, upkeep, safe custody of the e rected equipments till handing over.
3. Verification of installation as per drawing and document for the correctness of cabling, JBs, impulse pipe, various field device, panels, instruments etc.
4. Continuity check & IR value of cables.
5. Verification of correction of cable termination with respect to instrument, electrical hook-up diagram, panel interconnection diagram, JB schedule.
6. Checking earthing of the equipments and cable shield wire continuity.
7. Energizing the functional group control panels and field devices.
8. Flushing of impulse pipe before making the instruments process connections through.
9. Any leakage damages to impulse pipe, field device connections, air connections etc. Shall be fully attended by contractor.

C **TESTING & ASSISTANCE FOR COMMISSIONING**

1. Checking/verification of binary/analog input and output signal from field and panel and upto recording/indicating instrument/MMI monitors.
2. Adjustment, testing, calibration of pneumatic drive (control valve, trip valve, power cylinder for gate/dampers etc), electrical actuator operated valve/gate/dampers of other functional elements.

3. Checking and operating electrical/pneumatic drive through functional group panel, remote control desk, MMI, CRT operation and repeatability and smooth operation to be checked.
4. Checking the interlock, protection and alarm for various processes by stimulation of field devices/process changes.
5. Functional check of sub-loop control, sub group control and auto loop and fine-tuning.
6. Adjustment of limit switches/feed back position transmitter checking the l.s. of actuator for correct position indication and repeatability shall be ensured.
7. HT/LT motor IR value measurement, bearing/winding RTD checking, checking the HT lead connector, providing assistance for trial run of motor which includes monitoring temperature rise winding/bearing during trial run.
8. Contractor shall prepare calibration/testing report/protocols.
9. During trial run of various systems, the performance of any instrument found erratic, un-satisfactory are required re-adjustment, re-calibration etc. Contractor shall attend to the defects.
10. Observing and checking the performance of the various devices on load/process variation. Any deficiencies/defect noticed during the variable load conditions, the same shall be attended promptly.
11. Observe the proper functioning of sub-group/sub-loop control.
12. Check the operation of various control in manual /auto mode for smooth functioning.
13. Clearing of all bad signals arising during commissioning.

Any wiring correction or minor modification in control panel wiring noticed during the pre-commissioning, it shall be carried out.

4.8 FINAL PAINTING

4.8.1 Final Painting STG Electrical and C&I Package.

4.8.2

The Contractor shall arrange all primers, paints and other consumables like brush, cleaning agents etc within the quoted rates.

4.8.3

All exposed metal parts of the equipment including piping, supports, structures, equipments etc., as applicable shall be painted after thoroughly cleaning the surface from dust, rust, greases, oils, scales, etc, by wire brushing, scrapping, sand blasting, water washing etc; as specified in relevant erection documents. The above parts shall then be painted with specified number of coats of specified paint over the shop primer/paint. Also, where the shop primer/paint has peeled off, the affected area shall be cleaned thoroughly by the specified method and then primer coat applied. Similarly, certain components may be supplied without any primer/paint coat from shop. The surface of such items shall be cleaned as per specifications, coated with suitable primer and then coated with final paint coats. The dry film thickness after final coat should be as per specification. The color, the shade etc. Shall be as per specification. Painting schedule will be furnished at site. All Paints, primer etc supply also in the scope of the contractor within the quoted rates.

4.8.4

In addition, color banding, legend and identification marking, direction of flow/rotation marking etc, is part of work.

4.9 The work under this scope being quite sophisticated and also quite extensive, for proper planning, monitoring, reporting, etc of ongoing works, the contractor shall establish his own computer(s) and printer(s) at his site office, along with suitable operator(s), consumables, etc*. Non-establishment of above equipment will attract penalty @ Rs 5000 (Rs Five thousand only) per month.*

4.10 BHEL uses its own software SOMS (Site Operation and Management System) for total project execution and billing. The contractor shall also provide adequate and suitable manpower for updating / entries into SOMS in BHEL computers at site.

4.11 <u>Troubleshooting during plant operation</u>

During pre commissioning / commissioning stages when the plant will be under various stages of operation, it will be necessary to have continuous (day and night) presence of suitable manpower along with required tools to attend to any defects etc that may arise during such operation. The contractor will be required to put such personnel in shifts in both electrical and C&I area. The bidder must also take this aspect into consideration.

Section-5
Special Conditions of Contract

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

5.1 Labour Colony

BHEL'S customer will provide the open land with single point for drinking water and electricity. Contractor shall make further arrangements for constructing the labour colony and including lighting, water distribution and suitable provisions of drainage/sanitation.

5.2 Tools and Tackles

5.2.1
The contractor shall provide all required tools and plants, inspection, measuring and test equipments and handling & transportation equipments for the scope of work covered under these specifications. An indicative list of major T&P to be deployed by the contractor is given in the Appendix-III. It may be noted that the referred list does not intend to exhaustively cover the contractor's responsibility with regard to T&P to be deployed by him. BHEL will provide the services of their T&P listed vide Appendix-II, free of charge, on sharing basis. Refer section-7 for further details with regard to BHEL's T&P.

5.2.2
All tools and tackles to be deployed by the contractor for the work shall have the prior approval of BHEL engineer with regard to brand, quality and specification.

5.2.3
Contractor's responsibility with regard to operator, fuel, lubricants and daily upkeep of T&Ps provided by BHEL is further detailed in Section-7.

5.2.4
Timely deployment of adequate quantity of T&P is the responsibility of the contractor. The contractor shall be prepared to augment the T&P at short notice to match the planned programme and to achieve the milestones.

5.2.5
Contractor shall maintain and operate his tools and plants in such a way that major breakdowns are avoided. In the event of major breakdown, contractor shall make alternate arrangements expeditiously so that the progress of work is not hampered**.**

5.2.6
In the event of contractor failing to arrange the required tools, plants, machinery, equipment, material or non-availability of the same owing to breakdown, BHEL will make the alternate arrangement at the risk and cost of the contractor.

5.2.7
The T&P to be arranged by the contractor shall be in proper working condition. The operation shall not lead to unsafe condition. The movements of cranes, and other equipment should be such that no damage/breaking occurs to foundation, equipment, material and men. All arrangements for the movement of his T&P etc shall be the contractor's responsibility.

5.2.8
Normally, for welding only the use of welding generators/rectifiers will be permitted. The use of welding transformers will be subject to the approval of BHEL engineer.

5.2.9
The contractor at his cost shall carry out periodical testing of his construction equipments and calibration of measuring instruments (MMD) and tests. Test/ calibration certificates shall

be furnished to BHEL. MMD shall be calibrated only at accredited laboratory as per the list available with BHEL or any other laboratory approved by BHEL.

5.3.0 **Consumables**

5.3.1
The contractor shall provide all consumables required for carrying out the work covered under these specifications excepting those which are specifically indicated as BHEL scope.

5.3.2
All consumables to be used for the work shall have prior approval of BHEL engineer with regard to brand and quality specifications. Test reports/certificates in respect of these consumables, wherever applicable, shall be submitted to BHEL engineer.

12.2.1.1 **Primers, Paints etc** .
Contractor shall supply primers and paints for touch up, final painting etc required during erection stage and also for protecting gas-cut areas, weld joints etc.

5.4.0 **Welding Electrodes, Filler Wires for TIG Welding and Gases**

5.4.1
Contractor at his cost shall arrange all the required welding electrodes as approved by BHEL. It shall be the responsibility of the contractor to obtain prior approval of BHEL, before procurement, regarding manufacturer, type of electrodes etc. On receipt of the electrodes at site, it shall be subject to inspection and approval by BHEL regarding type of electrodes, batch number, date of expiry etc. Batch test certificates shall be made available for verification & record.

5.4.2
BHEL reserves the right to reject the use of any electrodes, if found non-acceptable because of bad quality, deterioration in quality due to improper storage, shelf life expiry, unapproved type/brand etc.

5.4.3
All the required gases like Argon, Oxygen, Acetylene etc. Shall be arranged by the contractor at his cost.

5.4.4
If at any time during the execution of work, it is noticed that the work is suffering on account of non-availability of consumables from the contractor's side BHEL will make alternate arrangements at the risk and cost of contractor. The expenditure incurred with overheads will be recovered from the contractor.

5.5.0 **Field Office**

5.5.1
The contractor shall make his own arrangements for field office and stores for accommodating necessary equipments, instrument calibration room for execution of the work. Only open space will be provided by BHEL customer free of charges within the project premises as per the availability of space.

5.5.2
On completion of work, all the temporary buildings, structures, pipelines, cables, etc. shall be dismantled and leveled and debris shall be removed as per instruction of BHEL by the contractor at his cost. In the event of his failure to do so, the same will be arranged to be removed and expenditure thereof will be recovered from the contractor. The decision of BHEL engineer in this regard shall be final. However, the scope of dismantling and leveling

the area is limited only to the contractor's site office, yard and other spaces occupied by the contractor.

5.6.0 **Area Lighting**

Contractor shall arrange adequate floodlights, hand lamps and area lighting. Provision of distribution lines for lighting from the single point 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 including all the materials like cables, fuses, switch boards etc.

5.7.0 **Construction Power & Water**

5.7.1

Construction Power (415v/440v) will be provided at a single point approx. 100 m from work site. The contractor shall provide all necessary cables, fuses, switches, switchboards, energy meters etc., and any other installation as specified by statutory authority in this regard for further drawl of power. Obtaining approvals, payment of necessary fees, duties etc towards the clearance of such installations, prior to their being put to use or as may be specified, shall be the responsibility of the contractor.

5.7.2

It shall be the responsibility of the contractor to provide, maintain the complete installation on the load side of the supply with due regard to the safety requirements at site. All cabling and installations shall comply in all respects with the appropriate statutory requirements.

5.7.3

The customer will provide water for construction purpose at a single point near the site. Further distribution, if permitted by the customer, has to be arranged by the contractor at his cost.

5.7.4

In case of non-availability of customer supplied power and/or water, it is the responsibility of the contractor to make alternate arrangements. Contractor shall be adequately equipped to arrange standby diesel welding generators in the event of construction power failure. Essential welding jobs shall not be stopped on account of main construction power failure.

5.7.5

BHEL is not responsible for any loss or damage to the contractor's equipment as a result of variations in voltage or frequency or interruptions in power supply.

2.0.0 **Contract Labour**

5.8.1

The contractor in the event of his engaging 10 or more workmen will obtain independent license under the contract labour (regulations and abolition) act 1970 from the concerned authorities based on the certificate (form–V) issued by the principal employer/customer.

5.8.2 **Provident Fund**

Contractor will deduct the necessary amount from his employees towards provident fund and contribute equal amount as per government of India labour laws regularly, will deposit this amount to the provident fund commissioner and get the account code. Contractor shall submit the account code duly certified by PF commissioner to BHEL project in-charge.

5.8.3

Contractor shall also comply with the provisions of ESIS act in vogue and submit evidence thereof to BHEL site in-charge. Also all other employees' benefits to be borne by the contractor as per the labour laws. Contractor shall produce necessary certificates towards their compliance with such statutes and payment of all statutory dues.

5.8.4
Contractor shall also comply with the requirements of local authorities/ project authorities calling for police verification of antecedents of the workmen, staff etc.

5.8.5
Where applicable, provisions of workman compensation act shall be adhered to.

5.8.6
BHEL/customer may insist upon witnessing the regular payment to the labour. They may also like to verify the relevant records for compliance with statutory requirements. Contractor shall enable such facilities to BHEL/ Customer.

5.9 TAXES, DUTIES, LEVIES

5.9.1 REFER TO CLAUSE 2.8.4 OF GENERAL CONDITIONS OF CONTRACT WHEREIN IT HAS BEEN MENTIONED AS FOLLOWS:

"The contractor shall pay all taxes, fees, license charges, deposits, duties, tolls, royalty, commissions or other charges which may be leviable on account of his operations in executing the contract. In case BHEL is forced to pay any of such taxes, BHEL shall have the right to recover the same from his bills or otherwise as deemed fit". Notwithstanding the aforesaid, following provisions shall be applicable for this contract.

5.9.2 SERVICE TAX & CESS ON SERVICE TAX

Service tax and CESS on it are excluded from contractor's scope; therefore contractor's price/rates shall be exclusive of service tax and CESS on service tax. In case, it becomes mandatory for the contractor under provisions of relevant act/law to collect the service tax from BHEL and deposit the same with the concerned tax authorities, the amount will be paid by BHEL. Contractor shall submit to BHEL documentary evidence of Service Tax registration and remittance record of such tax immediately after depositing the tax with concerned authorities. Contractor shall obtain prior written consent from BHEL before billing the amount towards such taxes.

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

4.1.1 VAT (Sales Tax /WCT)

As regards value added tax (vat) on transfer of property in goods involved in works contract (previously known as works contract tax) applicable as per local laws, the price quoted by the contractor shall be **exclusive** of the same. Where such taxes are required to be paid by the contractor, this will be reimbursed on production of proof of payment made to the authorities by the contractor. In any case the contractor shall register himself with the respective sales tax authorities of the state and submit proof of such registration to BHEL along with the first RA bill. The contractor has to take all necessary steps to **minimize tax on input goods** by purchasing the materials from any registered dealer of the concerned state only. In case contractor opts for composition, it will be with the prior express consent of BHEL. Deduction of tax at source shall be made as per the provisions of law unless otherwise found exempted. In case tax is deducted at source as per the provisions of law, this is to be construed as an advance tax paid by the contractor and no reimbursement thereof will be made unless specifically agreed to.

4.1.2 Modalities of Tax Incidence on BHEL

Wherever the relevant tax laws permit more than one option or methodology for discharging the liability of tax/levy/duty, BHEL will have the right to adopt the appropriate one considering the amount of tax liability on BHEL/client as well as procedural simplicity with regard to assessment of the liability. The option chosen by BHEL shall be binding on the contractor for discharging the obligation of BHEL in respect of the tax liability to the contractor.

4.1.3 New taxes/levies

In case the government imposes any new levy/tax on the output service/ goods/work after award of the contract, the same shall be reimbursed by BHEL at actual.

in case any new tax/levy/duty etc. Becomes applicable after the date of bidder's offer, the bidder/contractor must convey its impact on his price duly substantiated by documentary evidence in support of the same **before opening of price bid**. Claim for any such impact after opening the price bid will not be considered by BHEL for reimbursement of tax or reassessment of offer.

No reimbursement/recovery on account of increase/reduction in the rate of taxes, levies, duties etc. On input goods/services/work shall be made. Such impact shall be taken care of by the price variation/adjustment clause (pvc) if any. In case pvc is not applicable for the contract, bidder has to make his own assessment of the impact of future variation if any, in rates of taxes/duties/ levies etc. In his price bid.

5.10.0 Submission of Periodical Reports

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

1) Consumption of welding electrodes and gases
2) Consumption of construction power
3) Availability and utilization of BHEL's cranes if applicable
4) Manpower reports
5) Progress reports - periodically
6) Field calibration reports

BHEL at site will inform formats for these reports.

5.11

It is the responsibility of the contractor to arrange gate pass for all his employees, T&P etc. Necessary coordination with customer officials is the responsibility of the contractor. Contractor to follow all the procedures laid down by the customer for making gate passes. Where permitted, by customer/ BHEL, to work beyond normal working hours, the contractor shall arrange necessary work permit for working beyond normal working hours.

5.12 Compliance to Statutory/Mandatory Authorities

5.12.1

Refer section-8 for contractor's responsibilities regarding the work related inspection by statutory authorities.

5.12.2

The responsibilities of contractor with regard to compliance with requirements of statutory/mandatory authorities have been specified in various clauses of the specification. However, in addition to those specified already, the requirements of any other authority viz local self government bodies, factory inspector, provident fund commissioner; labour commissioner etc., in connection with this work has to be complied with by the contractor.

Section-6

Special Conditions of Contract

6.0 **Contractor's Obligation in regard to Employment of Supervisory Staff and Workmen**

6.1 The contractor shall deploy all the skilled/semiskilled/ unskilled labour including highly skilled workmen like high-pressure welders etc. These workmen should have previous experience on similar job. They shall hold valid certificates wherever necessary. BHEL reserves the right to insist on removal of any employee of the contractor at any time if he is found to be unsuitable and the contractor shall forthwith remove him. Contractor should furnish a tentative deployment plan of his manpower as required vide **Appendix-V**. Also the actual deployment will be so as to satisfy the erection and commissioning targets set by BHEL.

6.2 It is the responsibility of the contractor to engage his workmen in shifts and or on overtime basis for achieving the targets set by BHEL. This target may be set to suit BHEL's commitments to its customer or to advance date of completion of events or due to other reasons. The decision of BHEL in regard to setting the erection and commissioning targets will be final and binding on the contractor.

6.3 Contractor shall deploy only qualified and experienced engineers/ supervisors. They shall have professional approach in executing the work.

6.4 The contractor's supervisory staff shall execute the work in the most professional manner in the stipulated time. Accuracy of work and aesthetic finish are essential part of this contract. They shall be responsible to ensure that the assembly and workmanship conform to dimensions and tolerances given in the drawings/instructions given by BHEL engineer from time to time.

6.5 The supervisory staff employed by the contractor shall ensure proper outturn of work and discipline on the part of the labour put on the job by the contractor. Also in general they should see that the works are carried out in a safe and proper manner and in coordination with other labour and staff employed directly by BHEL or other contractors of BHEL /customer.

6.6 **Industrial Relations and Labour Laws**

An industrial relations supervisor shall coordinate for the implementation of local labour laws, maintenance of records as required by contract labour (regulation and abolition) act and also coordinate with the local labour authorities and any other such authorities under whom this work falls.

6.7 If at any time, it is found that the contractor is not in a position to deploy the required engineers/supervisors/workmen due to any reason, BHEL shall have the option to make alternate arrangements at the contractor's risk and cost.

6.8 **Site Organization**

The contractor shall provide adequate staffing in the following areas.

A) Overall planning, monitoring & control
B) Control & Instrumentation Erection & Commissioning
C) Quality Control And Quality Assurance
D) Materials Management
E) Safety, Fire & Security
F) Industrial Relations And Fulfillment Of Labour Laws And Other Statutory Obligations.

Contractor shall furnish an organization chart indicating the staffing pattern for the above functions. Contractor shall provide the names and details of engineer/supervisors at the time of mobilization to BHEL as per the proposed organization chart.

Section -7

Special Conditions of Contract

7.0 **Obligations of BHEL**

7.1 **Facilities Provided By BHEL**

7.1.1 **Space for Field Office**

Refer section -5 in this regard.

7.1.2 **Construction Water**

Refer section -5 in this regard.

7.1.3 **Construction Power**

Refer section-5 in this regard.

7.2. **Test Blanks (Plates & Pipes)**

BHEL will provide the raw material for preparation of test blanks for conducting the site qualification test of welders. Contractor shall prepare the required test coupons from such raw materials.

7.3 **Filler Wire for TIG Welding**

BHEL will not provide any filler wires.

7.4 **Equipments – Tools & Plants**

7.4.1

Special tools which are supplied by BHEL as part of maintenance tools to be handed over to customer under regular DU/DESS numbers in various product groups may be issued to the contractor free of charges for specific activities, at the discretion of BHEL. Contractor shall return them after the completion of the specific activity, for which the tools were spared, in good working order.

7.4.2

The contractor must not use these equipments for any purpose other than what they are intended for. Misuse, if any, will result in penalty.

7.4.3

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

Section-8

Special Conditions of Contract

8.0 Inspection/Quality Assurance/Quality Control/ Statutory Inspection

8.1 Various inspection/quality control/quality assurance procedures/ methods at various stages of erection and commissioning will be as per BHEL/customer quality control procedure/codes/IBR and other statutory pro visions and as per BHEL engineer's instructions.

8.2 Preparation of quality assurance log sheets and protocols with customer/ consultants/statutory authority, welding logs, NDE and post weld heat treatment records, testing & calibration records and other quality control and quality assurance documentation as per BHEL engineer's instructions, is within the scope of work/specification. These records shall be submitted to BHEL/customer for approval from time to time.

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

8.4 The performance of HP welders will be reviewed from time to time as per the BHEL/IBR standards. High-pressure welders' performance record shall be furnished periodically. Corrective action as informed by BHEL shall be taken in respect of those welders not conforming to these standards. This may include removal/ discontinuance of concerned welder(s). Contractor shall arrange for the alternate welders immediately.

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

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

8.7 The MMD deployed by the contractor shall, at all stages of work, have valid and current calibration. BHEL shall be done the calibration of these MMDs from the agencies accredited/ approved. Copy of calibration certificates in respect of these MMDs has to be submitted to BHEL. Periodical status report regarding validity of calibration has to be submitted to BHEL. Re-calibration/ re-validation shall be done periodically as per BHEL specifications. Contractor shall conform to the specifications of BHEL regarding storage of the MMDs.

8.8 Re-work necessitated on account of use of invalid MMDs shall be entirely to the contractor's account. He shall be responsible to take all corrective actions, including resource augmentation if any, as specified by BHEL to make-up for the loss of time.

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

8.10 vibration indicators/vibration recorders/vibration analyzers will be provided by BHEL for checking and analyzing vibration levels of rotating equipments with necessary operators. Contractor shall provided necessary labour for carrying out such tests. Similarly, BHEL will provide the oscilloscope for any specific requirement.

8.11 Total quality is the watchword of the work and contractor shall strive to achieve the quality standards, procedures laid down by BHEL. He shall follow all the instructions as per BHEL drawings and quality standards. Contractor shall provide for the services of quality assurance engineer.

8.12 **Stage Inspection by FES/QA Engineers**

8.12.1 Apart from day-to-day inspection by BHEL engineers stationed at site and also by customer's engineers, stage inspection of equipments under erection and commissioning at various stages of erection and commissioning by teams of engineers from field engineering services of BHEL's manufacturing units and quality assurance teams from field quality assurance factory quality assurance and commissioning engineers from technical services of BHEL will also be conducted. Contractor shall arrange all labour, tools and tackles etc., for such stage inspections as part of work.

8.13 Statutory Inspection of Work

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

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

1) Inspectorate of steam boilers / electrical and smoke nuisance

2) Any other authority connected to this work.

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

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

8.13.4 It shall be contractor's responsibility to obtain approval of statutory authorities, whenever applicable, for the conducting of any work which comes under the purview of these authorities. Any cost arising from this shall be contractor's account.

8.13.5 BHEL will pay fees for visits, inspection fees etc. of these statutory authorities. All other expenses shall be borne by the contractor. In case these inspections have to be repeated due to default/fault of the contractor and fees have to be paid again, the contractor has to bear the charges.

8.13.6 Contractor should be qualified to execute pressure parts & piping work coming under the purview of IBR, for which he should register himself with CIB Chhattisgarh. Similarly it is the responsibility of contractor to obtain license from chief electrical inspector, Chhattisgarh for carrying out high voltage work. Contractor also should be aware of the latest IBR regulations and electricity act, including the amendments thereof.

8.14.0 The quality management system of BHEL, Power Sector – Western Region (PSWR) has already been certified and accredited under ISO 9002 standards in this regard. The basic philosophy of the quality management system is to define the organizational responsibility, work as per documented procedures, verify the output with respect to acceptance norms, identify the non-conforming product/ procedure and take corrective action for removal of non-conformance specifying the steps for avoiding recurrence of such non-

conformities, & maintain the relevant quality records. The non-conformities are to be identified through the conduct of periodical audit of implementation of quality systems at various locations/stages of work. Suppliers/vendors of various products/services contributing in the work are also considered as part of the quality management system as such the contractor is expected not only to conform to the quality management system of BHEL but also t is desirable that they themselves are accredited under any quality management system standard.

8.15.0 BHEL, PSWR is accredited under relevant standards for Environmental Management System (ISO 14000) and Occupational Health Standard and Safety (OHSAS 18000). BHEL's suppliers are required to adhere to/ observe compliance with these standards. The requirements of these standards with regard to this work will be communicated at site which contractor has to fulfill.

SECTION-9

SPECIAL CONDITIONS OF CONTRACT

Safety, Occupational Health and Environmental Management

BHEL PSWR has been certified for Environmental Management under ISO 14001:1996 standard and Occupational Health & Safety under OHSAS 18001 by DNV. In order to comply with the above standards, it shall be the endeavor of BHEL and all its subcontractors to meet and implement the requirements by following the guidelines issued under Environmental, Occupational Health and Safety Management (EHS) manual a copy of which will be available with the BHEL Site-in-charge.

Contractor shall also enter into a "Memorandum of Understanding" as given in clause 9.9 in case of award of contract.

9.2 Responsibility of the Contractor in Respect of Safety of Men, Equipment, Material and Environment.

9.3 The Contractor shall:

9.1.1

Abide by the Safety Regulations applicable for the Site/Project and in particular as mentioned in the booklet "Safe Work Practices" issued by BHEL. Contractors are also to ensure that their employees and workmen use safety equipments as stipulated in the Factories Act (Latest Revision) during the execution of the work. Failure to use safety equipment as required by BHEL Engineer will be a sufficient reason for issuance of memo, which shall become part of Safety evaluation of the contractor at the end of the Project. Also all site work may be suspended if it is found that the workmen are employing unsafe working practice and all the costs/losses incurred due to suspension of work shall be borne by contractor. A comprehensive list of National Standards from which the contractor can draw references for complying with various requirements under this section is given under 9.10

9.1.2

Hold BHEL harmless and indemnified from and against all claims, cost and charges under Workmen's Compensation Act 1923 and 1933 and any amendment thereof and the contractor shall be solely responsible for the same.

9.1.3

Abide by the Procedure governing entry/exit of the contractor's personnel within the Customer/Client premises. All the contractors employees shall be permitted to enter only on displaying of authorized Photo passes or any other documents as authorized by the Customer/Client.

9.1.4

Be fully responsible for the identity, conduct and integrity of the personnel/workers engaged by them for carrying out the contract work and ensure that none of them are ever engaged in any anti national activity

9.1.5

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

xi) Name of Contractor
xii) Name of Contractor Site-in-charge & Telephone number
xiii) Job Description in short
xiv) Date of start of job
xv) Date of expected completion
xvi) Name of BHEL Site-in-charge.

9.1.6
Abide by the rules and regulations existing during the contract period as applicable for the contractors at the Project premises.

9.1.7
Observe the timings of work as advised by BHEL Engineer-in-charge for carrying out the contract work.

9.1 SPECIAL CONDITIONS

9.2.1 Safety

9.2.1.2 Safety Plan

Before commencing the work, contractor shall submit a "safety plan" to the authorized BHEL official. The safety plan shall indicate in detail the measures that would be taken by the contractor to ensure safety to men, equipment, material and environment during execution of the work. The plan shall take care to satisfy all requirements specified hereunder.

The contractor shall submit "safety plan" before start of work. During negotiations, before placing of work order and during execution of the contract, BHEL shall have right to review and suggest modifications in the safety plan. Contractor shall abide by BHEL's decision in this respect.

9.2.1.3
The contractor shall take all necessary safety precautions and arrange for appropriate appliances and/or as per direction of BHEL or it's authorized person to prevent loss of human lives, injuries to men engaged and damage to property and environment.

9.2.1.4
The contractor shall provide to his work force and also ensure the use of Personnel Protection Equipment (PPE) as found necessary and/or as directed and advised by BHEL officials without which permission is liable to be denied.

- Safety helmets conforming to IS 2925/1984 (1990)
- Safety belts conforming to IS 3521/1989
- Safety shoes conforming to IS 1989 part-II /1986(1992)
- Eye and face protection devices conforming to IS 2573/1986(1991), IS 6994 (1973), part-I (1991), IS 8807/1978 (1991), IS 8519/1977(1991).
- Other job specific PPEs of standard ISI make as may be prescribed

9.2.1.5
All tools, tackles, lifting appliances, material handling equipment, scaffolds, cradles, cages, safety nets, ladders, equipment, etc used by the contractor shall be of safe design and construction. These shall be tested and certificate of fitness obtained before putting them to use and from time to time as instructed by authorized BHEL official who shall have the right to ban the use of any item found to be unsafe.

9.2.1.6
All electrical equipment, connections and wiring for construction power, its distribution and use shall conform to the requirements of Indian Electricity Act and Rules. Only electricians licensed by the appropriate statutory authority shall be employed by the contractor to carryout all types of electrical works. All electrical appliances including portable electric tools used by the contractor shall have safe plugging system to source of power and be appropriately earthed.

9.2.1.7
The contractor shall not use any hand lamp energized by electric power with supply voltage of more than 24 volts. For work in confined spaces, lighting shall be arranged with power source of not more than 24 volts.

9.2.1.8
The contractor shall adopt all fire safety measures as per relevant Indian Standards

9.2.1.9
Where it becomes necessary to provide and/or store petroleum products, explosives, chemicals and liquid or gaseous fuel or any other substance that may cause fire or explosion, the contractor shall be responsible for carrying out such provisions and/or storage in accordance with the rules and regulations laid down by the relevant government acts, such as petroleum act, explosives act, petroleum and carbides of calcium manual of the chief controller of explosives, Government of India etc. The contractor in all such matters shall also take prior approval of the authorized BHEL official at the site.

9.2.1.10
Proper means of access must be used e.g. ladders, scaffolds, platforms etc. No makeshift access such as oil drums or pallets shall be used. Design of these will be in accordance with relevant standards and certified by competent persons before use.

9.2.1.11
Temporary arrangements made at Site for lifting , platforms, approach access etc should be properly designed and approved before being put to use.

9.2.1.12
All excavations and openings must be securely and adequately fenced/barricaded and warning signs erected when considered necessary as per relevant code of practice.

9.2.1.13
No persons shall remove guardrails, covers or protective devices unless authorized by a responsible supervisor and alternative precautions have been taken

9.2.1.14
Access ways, means of escape and fire exits shall be clearly marked, kept clear and unobstructed at all times

9.2.1.15
Only authorized persons holding relevant license will drive and operate site plant and equipments eg cranes, dumpers, excavators, transport vehicles etc

9.2.1.16
Only authorized personnel are allowed to repair, commission electrical equipments.

9.2.1.17
Gas Cylinders shall be handled and stored as per Gas Cylinders Rules and relevant safe working practices

9.2.1.18
All wastes generated at Site shall be segregated and collected in a designated place so as to prevent spillage/contamination/scattering at Site, until the waste is lifted for disposal to designated disposal area as advised by BHEL official.

9.2.1.19
The contractor shall arrange at his cost (wherever not specified) appropriate illumination at all work spots for safe working when natural day light is not adequate for clear visibility.

9.2.1.20
The contractor shall train adequate number of workers/supervisors for administering "FIRST AID". List of competent first aid administers should be prominently displayed.

9.2.1.21
The contractor shall display at strategic places and in adequate numbers the following in fluorescent markings

- Emergency telephone numbers
- Exit, Walkways
- Safe working load charts for wire ropes, slings, D shackles etc
- Warning signs

9.2.1.22
The contractor shall be held responsible for any violation of statutory regulations (local, state or central) and BHEL instructions that may endanger safety of men, equipment, material and environment in his scope of work or other contractors or agencies. Cost of damage, if any, to life and property arising out of such violation of statutory regulations and BHEL instructions shall be borne by the contractor.

9.2.1.23
In case of a fatal or disabling injury/accident to any person at construction sites due to lapses by the contractor, the victim and/or his/her dependents shall be compensated by the contractor as per statutory requirements. However, if considered necessary, BHEL shall have the right to impose appropriate financial penalty on the contractor and recover the same from payments due to the contractor for suitably compensating the victim and/or his/her dependents. Before imposing any such penalty, appropriate enquiry shall be held by BHEL giving opportunity to the contractor to present his case.

9.2.1.24
In case of any damage to property due to lapses by the contractor, BHEL shall have the right to recover cost of such damages from payments due to the contractor after holding an appropriate enquiry.

9.2.1.25
In case of any delay in the completion of a job due to mishaps attributable to lapses by the contractor, BHEL shall have the right to recover cost of such delay from payments due to the contractor after notifying the contractor suitably and giving him opportunity to present his case.

9.2.1.26
If the contractor fails to improve the standards of safety in its operation to the satisfaction of BHEL after being given a reasonable opportunity to do so, and/or if the contractor fails to take appropriate safety precautions or to provide necessary safety devices and equipment or to carry out instructions regarding safety issued by the authorized BHEL official, BHEL shall have the right to take corrective steps at the risk and cost of the contractor after giving a notice of not less than seven days indicating the steps that would be taken by BHEL.

9.2.1.27 **Emergency Response**

BHEL will have an Emergency Response Plan for each Project Site in consultation with the Owner as the case may be, detailing the procedure for mobilization of personnel and equipment, and defining the responsibilities of the personnel indicated, in order to prepare for any emergency that may arise in order to ensure the priorities of

- Safeguard of life
- Protect assets under construction or neighboring
- Protect environment
- Resumption of normal operations as soon as the emergency condition is called off

All Contractors shall also be part of the Emergency response Plan and the personnel so nominated shall be aware of their duties and responsibilities in an emergency response situation.

9.2.1.27
At least 5% Contractors supervisors and workmen shall undergo training in administering 'First Aid'. The trained persons should represent for all categories of work and for all areas of work. Adequate number of trained persons should be available for each shift. These first aides shall be included in the emergency response team. Contractor employees and workmen are encouraged to participate in first aid training programmes whenever organized by BHEL.

9.2.1 OCCUPATIONAL HEALTH

9.2.2.0
Specific occupational health hazards will be identified through the hazard evaluation processes in consultation with BHEL engineers and the necessary prevention/reduction/elimination methods implemented.

9.2.2.1
All personnel working in an activity with a potential risk to health shall be made aware of all those risks and the actions they must take to reduce/control/eliminate the risk

9.2.2.2
Safety coordinator shall conduct periodic checks to ensure that every group of workers engaged in similar activities are aware of potential risks to health and the actions required to be taken to mitigate the risk

9.2.2.3
In order to protect personnel from associated health hazards, the following main areas will be focused

- Issue of approved Personnel Protective Equipment
- Verification that the PPEs are adequate/maintained and worn by all staff involved in operations that are potentially hazardous to their health
- Ensure that the personnel deployed are physically fit for the operation/work concerned
- Provide hygienic and sanitary working conditions

9.2.2.4
Contractor workers employees engaged in noise risk areas shall be issued with hearing protection aids and the use of the same will be enforced. Further, these workers will be educated on the hazards of noise

9.2.2.5
Contractor workers engaged in dust environment shall be issued with necessary dust protection aids and the use of the same shall be enforced

9.2.2.6
Workers engaged in exposure to bright light/rays as in welding or radiation shall be issued with eye protection devices and the use of the same shall be enforced

9.2.2.7
Adequate arrangements shall be made to provide safe drinking water

9.2.2.8
Health monitoring records on at least sample basis for contractor employees & workmen shall be maintained for persons engaged in specified categories of work. These shall include

- Noise induced hearing loss
- Lung Function test
- Ergonomic Test
- Eye Test for Welders, Grinders, Drivers etc

9.2.3.4 HYGIENE and HOUSEKEEPING

9.2.3.5
Good house keeping and proper hygiene is one of the key requirements of Occupational Health Safety and Environment management. Towards this the contractor shall encourage his workers and supervisors to maintain cleanliness in their area of work.

9.2.3.6
The Contractor shall arrange to place waste bins/chutes at convenient locations for the collection of scrap and other wastes. The bins shall be clearly marked and segregated for metal, non-metal, hazardous and non hazardous wastes.

9.2.3.7
BHEL may take up appropriate remedial measures at the cost of the contractors if the contractors fail in good house keeping and if there is an imminent risk of pollution

9.2.1 ENVIRONMENT MANAGEMENT

9.2.4.1
BHEL has a sound environmental management system, which is to be maintained and implemented by all the contractors. The system allows for project specific objectives to be set and developed sensitive to client requirements, applicable environmental legislation and BHEL's own objectives and policy. BHEL engineers will assess and monitor the environmental impact of their work and lay out objectives for their minimization. The contractors shall implement the objectives for continual improvement of environmental performance. BHEL shall regularly audit environmental impacts and their improvements.

9.2.4.2 WASTE MANAGEMENT

9.2.4.3.1
The objective of waste management is to ensure the safe and responsible disposal of waste, ensuring that it is correctly disposed of and being able to audit the process to ensure compliance.

9.2.4.3.2
Chemical wastes if any shall be collected separately and disposed of to BHEL designated refuse yard as per BHEL advise

9.2.4.3.3
No dangerous chemicals, noxious waste products or materials will be disposed off on or off site without approval obtained through BHEL.

9.2.4.3.4
All disposal of wastes generated during construction shall be in accordance with all relevant legislation.

9.2.4.3.5
Acid and alkali cleaning wastes shall be neutralized to acceptable norms before disposal to the designated area.

9.2.4.3.6
All necessary measures shall be taken to ensure safe collection and disposal of waste oils. In particular to ensure the prevention of their discharge into surface waters, ground waters, coastal waters or drainages

9.3 **SUPERVISION**

9.3.0

Contractor must provide at least one full time on site safety coordinator when the manpower engaged is in excess of 50 for the contract activities in the premises. If the manpower is less than 50, the on site safety coordination responsibilities shall be assumed by any one of the contractor's other supervisory staff; however in both the cases, the contractor must specify in writing the name of such persons to the BHEL Engineer in Charge.

9.3.2

Contractor's safety coordinator or his supervisor responsible for safety as the case may be shall conduct at his work site, and document formal safety inspection and audits at least once in a week. Such documents are to be submitted to BHEL Engineer in Charge for his review and record.

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

9.3.3

Before starting work under any contract, the contractor must ensure that a job specific safety procedures/field practices as required over and above the safety permit conditions are prepared and followed .He should also ensure that all supervisors and workers involved understand and follow this procedures /field practices.

9.3.4
Contractor must ensure that in his work site appropriate display boards are put displaying signs for site safety, potential hazards and precautions required.

9.4.0 **TRAINING & AWARENESS**

9.4.1

Contractor shall deploy experienced supervisors and other manpower who are well conversant with the safety and environment regulations of the Project. The electricians to be deployed on the job should have wireman license.

9.4.2
All Supervisors & Workmen of the Contractor shall undergo Fire safety training/ demonstration whenever arranged by BHEL with the help of either Customer's Fire and Safety department or outside faculty so as to acquire knowledge of fire prevention and also to be able to make use of appropriate fire extinguishers.

9.4.3
Contractor must familiarize himself from BHEL Engineer in Charge about all known potential fire, explosion or toxic release hazards related to the contract. He in turn will ensure that same information has been passed to the supervisors and workmen

9.4.4
Contractor must ensure that all his supervisors are properly trained and each employee has received and understood from his supervisor necessary training and briefing about the safety requirement. Necessary document as a means to verify that employees have understood the training is to be maintained.

9.4.5
The contractor supervisors shall also give a small safety briefing to all the workmen under his charge before undertaking any new work and specially understand the safety requirements that are mandatory

9.5.6 **REPORTING**

9.5.7
The contractor shall submit report of all accidents, fires and property damage, dangerous occurrences to the authorized BHEL official immediately after such occurrence but in any case not later than twelve hours of the occurrence. Such report shall be furnished in the manner prescribed by BHEL and also to meet statutory requirement.

9.5.8
Any injury sustained by any of the contractor's employees within the Project premises must be reported to BHEL supervisor and FIRST AID should be immediately administered. The Contractor shall be responsible for keeping and maintaining proper records of Accidents to his personnel.

9.5.9
Contractor must arrange to immediately investigate, properly document and report any injury, accident or near miss involving any of his employees and take appropriate follow up action. He must furnish within 12 hours of the incident a written report to BHEL Engineer in charge and the Safety Section.

9.5.10
According to the Factory Act and the Employees state Insurance Act & regulation, any person sustaining any injury within the project premises and absenting himself from work for more than 46 hours, his accident report has to be sent to the respective Government Authorities. Therefore contractor shall inform the owner's representative such matter immediately for their needful action.

9.5.11
In addition, contractor shall submit periodic reports on safety to the authorised BHEL official from time to time as prescribed.

9.5.12
Before commencing the work, the contractor shall appoint/nominate a responsible officer to supervise implementation of all safety measures and liaison with his counterpart of BHEL.

9.1 **AUDIT REVIEW AND INSPECTION**

9.6.1
BHEL shall conduct audit on the contractor performance and compliance with the project specific requirements of the Environment and Occupational Health & Safety Management systems. The programme of audit shall cover all activities under the contract but will focus particularly on high-risk activities. The Construction Manager shall decide the schedule of audit. The audit findings shall be communicated to the contractors and necessary remedial action as advised by BHEL Engineers shall be under taken within the stipulated time.

9.6.2
Inspections shall be carried out regularly by the contractors and by BHEL Engineers on activities, facilities, equipment, documentation, to cover the following aspects.

- Compliance with procedures and systems
- Availability, condition and use of PPE
- Condition of maintenance tools, equipments, facilities
- Availability of fire fighting equipments and its condition
- Use of fire fighting equipments and first aid kit
- Awareness of occupational health hazard
- Awareness of safe working practices
- Presence of quality supervision
- Housekeeping

The Safety coordinator shall visit and inspect work sites daily. All unsafe acts, unsafe conditions that have imminent potential for causing harm/injury/damage will be immediately corrected. He shall maintain a daily logbook giving details of unsafe acts or conditions observed and the corrective action taken and recommendations for preventing recurrence. Adequacy of corrective actions will be verified

The contractor shall take remedial measures as per the findings of each inspection
Besides the above, the contractor shall be required to carry out the following inspections

Sl no	**Equipment**	**Scope of inspection**	**Inspection by**	**Schedule**
1	Hand tools	To identify unsafe/defective tool	User	Daily
2	Power tools	To identify unsafe/defective tool	User	Daily
3	Fire Extinguishers	To check pressure and any defect	User / Safety Coordinator	Daily Every month
4	Lifting equipment/tacles	To check for defects and efficacy of brakes	User Third party	Daily Every Year
5	PPE	To check for defects	User	Daily

9.2 **NON COMPLIANCE**:-

9.7.1
NONCONFORMITY OF SAFETY RULES AND SAFETY APPLIANCES WILL BE VIEWED SERIOUSLY AND THE BHEL HAS RIGHT TO IMPOSE FINES ON THE CONTRACTOR AS UNDER **for every instance of violation noticed**:

Sl. No	Safety	Fine (in Rs)
01	Not Wearing Safety Helmet	50/-
02.	Not wearing Safety Belt	100/-
03.	Grinding Without Goggles	50/-
04.	Not using 24 V Supply For Internal Work	500/-
05.	Electrical Plugs Not used for hand Machine	100/-
06.	Not Slinging property	200/-
07.	Using Damaged Sling	200/-
08.	Lifting Cylinders Without Cage	500/-
09.	Not Using Proper Welding Cable With Lot of Joints And Not Insulated Property.	200/-
10.	Not Removing Small Scrap From Platforms	200/-
11.	Gas Cutting Without Taking Proper Precaution or Not Using Sheet Below Gas Cutting	200/-
12.	Not Maintaining Electric Winches Which are Operated Dangerously	500/-
13.	Improper Earthing Of Electrical T&P	500/-
	Major Accident or Accidents causing partial loss of earning to the victim	50,000/- per victim
14	Fatal Accident or Accidents causing permanent loss of earning to the victim	1,00,000/- per victim

Any other non-conformity noticed not listed above will also be fined as deemed fit by BHEL. The decision of BHEL engineer is final on the above. The amount will be deducted from running bills of the contractor. The amount collected above will be utilised for giving award to the employees who could avoid accident by following safety rules. Also the amount will be spent for purchasing the safety appliances and supporting the safety activity at site.

13.6
CITATION:-If safety record of the contractor in execution of the awarded job is to the satisfaction of safety department of BHEL, issue of an appropriate certificate to recognize the safety performance of the contractor may be considered by BHEL after completion of the job

13.7 Memorandum of Understanding

After Award Of Work, Contractors Are Required To Enter Into A Memorandum Of Understanding As Given Below:

5 Memorandum of Understanding

BHEL, PSWR is committed to Health, Safety and Environment Policy (EHS Policy) as given in the booklet titled " Safe Working Practices" issued to all con tractors.

M/s _____ do hereby also commit to the same EHS Policy while executing the Contract Number _____

M/s _____ shall ensure that safe work practices not limited to the above booklet are followed by all construction workers and supervisors. Spirit and content therein shall be reached to all workers and supervisors for compliance.

BHEL will be carrying out EHS audits twice a year and M/s _____ shall ensure to close any non-conformity observed/reported within fifteen days.

Signed by authorized representative of M/s----------

Name :

Place & Date:

13.8

Comprehensive list of National Standards for reference and use wherever applicable in the execution of Civil, Erection and Commissioning Contracts.

IS No	YEAR	Amd upto	DESCRIPTION
IS 10204	1982		PORTABLE FIRE EXTINGUISHERS MECHANICAL FOAM TYPE
IS 10245	1994		SPECIFICATION FOR BREATHING APPARATUS
IS 10291	1982		SAFETY CODE FOR DRESS DRIVERS IN CIVIL ENGINEERING WORKS
IS 10658	1983		HIGHER CAPACITY DRY POWDER FIRE EXTINGUISHERS (TROLLEY MOUNTED)
IS 10662	1992		COLOUR TELEVISION
IS 10667	1983		GUIDE FOR SELECTION OF INDUSTRIAL SAFETY EQUIPMENT FOR PROTECTION OF FOOT AND LEG
IS 11037	1984		ELECTRONIC FAN REGULATORS
IS 11057	1984		INDUSTRIAL SAFETY NETS
IS 11451	1998		RECOMMENDATION FOR SAFETY AND HEALTH REQUIREMENT RELATING TO OCCUPATION EXPOSURE TO ASBESTOS
IS 1169	1967		PEDESTAL FANS
IS 1179	1967		SPECIFICATION FOR EQUIPMENT FOR EYE AND FACE PROTECTION DURING WELDING
IS 11833	1986		DRY POWDER FIRE EXTINGUISHERS FOR METAL FIRES
IS 11972	1987		CODE OF PRACTICE FOR SAFETY PRECAUTION TO BE TAKEN WHEN ENTERING A SEWARAGE SYSTEM

IS No	YEAR	Amd upto	DESCRIPTION
IS 1287	1986		ELECTRIC TOASTER
IS 13063	1991		STRUCTURAL SAFETY OF BUILDING S ON SHALLOW FOUNDATIONS ON ROCKS
IS 13385	1992		SPECIFICATIONS FOR FIRE EXTINGUISHERS 50 LITRE WHEEL MOUNTED WATER TYPE (GAS CARTRIDGES)
IS 13386	1992		SPECIFICATIONS FOR FIRE EXTINGUISHERS 50 LITRE MECHANICAL FOAM TYPE
IS 13415	1992		CODE OF SAFETY FOR PROTECTIVE BARRIERS IN AND AROUND BUILDINGS
IS 13416	1992		RECOMMENDATIONS FOR PREVENTIVE MEASURES AGAINST HAZARDS AT WORKING PLACE PART 1 TO PART 5
IS 13430	1992		CODE OF PRACTICE FOR SAFETY DURING ADDITIONAL CONSTRUCTION AND ALTERATION TO EXISTING BUILDINGS
IS 13849	1993		PORTABLE FIRE EXTINGUISHERS DRY POWDER TYPE (CONSTANT PRESSURE)
IS 1446	1985		CLASSIFICATION OF DANGEROUS GOODS (FIRST REVISION)
IS 1476	1979		REFRIGERATORS
IS 1641	1988		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS (GENERAL): GENERAL PRINCIPLES OF FIRE GRADING AND CLASSIFICATION
IS 1642	1989		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS- DETAILS OF CONSTRUCTION
IS 1643	1988		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS (GENERAL): EXPOSURE HAZARD
IS 1646	1997		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS (GENERAL): ELECTRICAL INSTALLATIONS
IS 1904	1986		CODE OF PRACTICE FOR DESIGN AND CONSTRUCTION OF FOUNDATIONS IN SOIL
IS 1905	1987		STRUCTURAL SAFETY OF BUILDINGS MASONARY WALLS
IS 2082	1985		ELECTRICAL GEYSERS
IS 2171	1985		PORTABLE FIRE EXTINGUISHERS DRY POWDER TYPE (CARTRIDGE)
IS 2309	1989		PRACTICE FOR THE PROTECTION OF BUILDINGS AND ALLIED BUILDINGS AGAINST LIGHTENING
IS 2312	1967		EXHAUST FANS
IS 2361	1994		SPECIFICATION FOR BUILDING GRIPS - FIRST REVISION
IS 2418	1977		TUBULAR FLUORSCENT LAMPS IS 2418 (FT-1)
IS 2750	1964		STEEL SCAFFOLDINGS
IS 2762	1964		SAFE WORKING LOADS IN KGS FOR WIRE ROPE SLINGS
IS 2878	1986		FIRE EXTINGUISHERS CARBON DIOXIDE TYPE (PORTABLE AND TROLLEY MOUNTED)
IS 2925	1984		SPECIFICATION FOR INDUSTRIAL SAFETY HELMETS
IS 3016	1982		CODE OF PRACTICE FOR FIRE PRECAUTIONS IN WELDING AND CUTTING OPERATIONS- FIRST REVISION
IS 3315	1974		DESERT COOLERS
IS 3521	1989		INDUSTRIAL SAFETY BELTS AND HARNESS
IS 368	1983		IMMERSION WATER HEATERS
IS 3696	1991		SAFETY CODE OF SCAFFOLDS AND LADDERS PART 1 TO 2
IS 3737	1996		LEATHER SAFETY BOOTS FOR WORKERS IN HEAVY METAL INDUSTRIES
IS 374	1979		CEILING FANS INCLUDING REGULATORS
IS 3764	1992		EXCAVATION WORK - CODE OF SAFETY

IS No	YEAR	Amd upto	DESCRIPTION
IS 3786	1983		METHOD FOR COMPUTATION OF FREQUENCY AND SEVERITY RATES FOR INDUSTRIAL INJURIES AND CLASSIFICATION OF INDUSTRIAL ACCIDENTS
IS 3935	1966		CODE OF PRACTICE FOR COMPOSITE CONSTRUCTION
IS 4014	1967		CODE OF PRACTICE FOR STEEL TUBULAR SCAFFOLDING
IS 4081	1986		SAFETY CODE FOR BLASTING AND RELATED DRILLING OPERATIONS
IS 4082	1977	1996	STACKING AND STORAGE OF CONSTRUCTION MATERIALS AND COMPONENTS AT SITE
IS 4130	1991		DEMOLITION OF BUILDINGS - CODE OF SAFETY PART 1 TO 2
IS 4138	1977		SAFETY CODE FOR WORKING IN COMPRESSED AIR (FIRST REVISION)
IS 4155	1966		GLOSSARY OF TERMS RELATING TO CHEMICAL AND RADIATION HAZARDS AND HAZARDOUS CHEMICALS
IS 4209	1967		CODE OF SAFETY FOR CHEMICAL LABORATORY
IS 4250	1980		FOOD MIXERS
IS 4262	1967		CODE OF SAFETY FOR SULFURIC ACID
IS 4756	1978		SAFETY CODE FOR TUNNELING WORK
IS 4912	1978		SAFETY REQUIREMENTS FOR FLOOR AND WALL OPENINGS, RAILINGS AND TOE BOARDS
IS 5121	1969		SAFETY CODE FOR PILING AND OTHER DEEP FOUNDATIONS
IS 5182	1969	1982	METHODS FOR MEASUREMENT OF AIR POLLUTION
IS 5184	1969		CODE OF SAFETY FOR HYDROFLUORIC ACID
IS 5216	1982	2000	RECOMMENDATIONS ON SAFETY PROCEDURES AND PRACTICE IN ELECTRICAL WORK PART I AND II
IS 555	1979		TABLE FANS
IS 5557	1995		INDUSTRIAL AND SAFETY LINED RUBBER BOOTS (SECOND REVISION)
IS 5916	1970		SAFETY CODE FOR CONSTRUCTION INVOLVING USE OF HOR BITUMINOUS MATERIALS
IS 5983	1980		SPECIFICATION FOR EYE PROTECTORS - FIRST REVISION
IS 6234	1986		PORTABLE FIRE EXTINGUISHERS WATER TYPE (STORED PRESSURE)
IS 692	1994		CRITERIA FOR SAFETY AND DESIGN OF STRUCTURES SUBJECTED TO UNDERGROUND BLASTS
IS 6994	1973		SPECIFICATION FOR SAFETY GLOVES
IS 7155	1986		CODE OF RECOMMENDED PRACTICE FOR CONVEYOR SAFETY (PART 1 TO 8)
IS 7205	1974		SAFETY CODE FOR ERECTION OF STRUCTURAL STEEL WORK
IS 7293	1974		SAFETY CODE FOR WORKING WITH CONSTRUCTION MACHINERY
IS 7323	1994		GUIDELINES FOR OPERATIONS OF RESERVOIRS
IS 7812	1975		CODE OF SAFETY FOR MERCURY
IS 7969	1975		SAFETY CODE FOR HANDLING AND STORAGE OF BUILDING MATERIALS
IS 8089	1976		CODE OF SAFE PRACTICE FOR LAYOUT OF OUTSIDE FACILITIES IN AN INDUSTRIAL PLANT
IS 8091	1976		CODE OF PRACTICE FOR INDUSTRIAL PLANT LAYOUT
IS 8095	1976		ACCIDENTS PREVENTION TAGS

IS No	YEAR	Amd upto	DESCRIPTION
IS 818	1968	1997	CODE OF PRACTICE FOR SAFETY AND HEALTH REQUIREMENTS IN ELECTRIC AND GAS WELDING, AND CUTTING OPERATIONS
IS 8448	1989		AUTOMATIC LINE VOLTAGE CORRECTOR (STABILISER)
IS 8519	1977		GUIDE FOR SELECTION OF INDUSTRIAL SAFETY EQUIPMENT FOR BODY PROTECTION
IS 8520	1977		GUIDE FOR SELECTION OF INDUSTRIAL SAFETY EQUIPMENT FOR EYE, FACE AND EAR PROTECTION
IS 875	1987		STRUCTURAL SAFETY OF BUILDING: LOADING STANDARD PART 1 TO 5
IS 8807	1978		GUIDE FOR SELECTION OF INDUSTRIAL SAFETY EQUIPMENT FOR PROTECTION OF ARMS AND HANDS
IS 8978	1985		INSTANTANEOUS WATER HEATERS
IS 8989	1978		SAFETY CODE FOR ERECTION OF CONCRETE FRAMED STRUCTURES
IS 940	1989		PORTABLE FIRE EXTINGUISHERS WATER TYPE (GAS CARTRIDGE)
IS 9457	1980		SAFETY COLOURS AND SIGNS
IS 9679	1980		CODE OF SAFETY FOR WORK ENVIRONMENTAL MONITORING
IS 9706	1997		CODE OF PRACTICE FOR THE CONSTRUCTION OF AERIAL ROPEWAYS FOR THE TRANSPORTATION OF MATERIAL
IS 9759	1981		GUIDELINES FOR DEWATERING DURING CONSTRUCTION
IS 9815	1989		SERVO MOTOR OPERATED LINE VOLTAGE CORRECTOR (SERVO STABILISER)
IS 9944	1992		RECOMMENDATIONS ON SAFE WORKING LOAD FOR NATURAL AND MAN-MADE FIBRE ROPE SLINGS
IS 996	1979		SINGLE PHASE ELECTRIC MOTORS
ISO 3873	1977		SAFETY HELMET

SECTION-10

SPECIAL CONDITIONS OF CONTRACT

10.0 DRAWINGS AND DOCUMENTS

10.1
The detailed drawings, specifications available with BHEL engineers will also form part of this tender specification. Revision of drawings/documents may take place due to various considerations as is normal in such large project. Work will have to be carried out as per revised drawings/ documents. These documents will be made available to the contractor during execution of work at site.

10.2
One set of necessary drawings/documents to carry out the erection work will be furnished to the contractor by BHEL on loan that shall be returned to BHEL after completion of the work. Contractor's personnel shall take care of these documents given to them.

10.3
The data furnished in various sections and appendices and the drawings enclosed with this tender specification describe the equipment to be installed, tested and commissioned under this specification, briefly. However, the changes in the design and in the quantity may be expected to occur as is usual in any such large scale of works.

10.4
If any error or ambiguity is discovered in the specification/information contained in the documents/drawings and tender, the contractor shall forthwith bring the same to the notice of BHEL before submission of offer.

10.5
In case an ambiguity is detected after award of work, the same must be brought to the notice of BHEL before commencement of the work/activity. BHEL's interpretation in such cases will be final and binding on the contractor.

10.6
In case of any conflict between general instructions to tenderness, general conditions of contract contained in sections 1 & 2 respectively and special conditions of contract contained in sections 4 to 15 and appendices, provisions contained in special conditions of con t in sections 4 to 15 and appendices shall prevail.

10.7
In case of discrepancy between quoted item rate and corresponding amount in the rate schedule, the **quoted item rates shall be reckoned as correct and amount recalculated**. Quoted item rates shall also prevail for arriving at the total price quoted for offer evaluation. Offers will evaluated on the total amount for the entire Rate Schedule and the work will be awarded without splitting the scope.

10.8
Bank Guarantees to be furnished by the contractor towards Security Deposit and Performance Guarantee (last 5% payment against workmanship warranty/defect liability) shall have a claim period of six months over and above the validity period required for the respective cases. BG for advance payment shall be kept valid for a period of two more months beyond the recovery period of the advance with interest thereof.

SECTION-11

SPECIAL CONDITIONS OF CONTRACT

TIME SCHEDULE, MOBILIZATION, PROGRESS MONITORING, OVER RUN, VARIATION ETC.

11.1 TIME SCHEDULE & MOBILIZATION

11.1.1 INITIAL MOBILIZATION AND TENTATIVE SCHEDULE

Contractor shall reach site, make his site establishment and be ready to commence the work within one week from the date of fax letter of intent or as per directions of construction manager of BHEL.

The contractor has to subsequently augment his resources in such a manner that the entire work is completed to achieve the following tentative schedule:

1.1.1 Tentative Project schedule

Sl no	Description	Tentative schedule
1	Start of work	Feb '07
2	Unit 1 Barring Gear	March '07
3	Unit 2 Barring Gear	Apr '07
4	Unit 1 synchronization	Apr '07
5	Unit 2 synchronization	May '07
6	Completion of activities	Aug '07

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

11.1. 3 CONTRACT PERIOD

The total contract period for completion of entire work under scope shall be **7 (seven) months** from the start of contract period.

Permanent erection of the first major sub-assembly/main assembly of any equipment on its designated foundation/location following due process of pre-assembly/pre-erection checks and quality checks as per approved field quality plan (FQP) shall be considered as the **start of contract period** for this contract. Placement of packer plates, base frame etc. shall not be considered as start of erection.

11.1.4 **GRACE PERIOD**

Grace period of **2 (two) months** beyond the contract period may be provided for this contract at the discretion of BHEL.

11.1.5 CONSEQUENCE OF DELAY

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

11.2 PROGRESS MONITORING, CONTRACT EXTENSION AND OVERRUN

11.2.1 PROGRESS MONITORING

Progress will be reviewed periodically (daily/weekly/monthly) including month end review vis-à-vis the plans drawn as above. The contractor shall submit periodical progress reports and other reports/information including manpower, consumables etc as desired by BHEL.

11.2.2 ASCERTAINING AND ESTABLISHING THE REASONS FOR SHORTFALL

The onus probandi that the causes leading to extension of the contract period are not due to any reasons attributable to the contractor is on him (the contractor). Review of the performance as stated vide Cl. 11.2.1 above will be made considering the availability of components to be erected and other inputs / constraints over which the contractor has no control. The programme will be reviewed area-wise and the following facts will be recorded in case of shortfall at the end of every month:

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

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

C) Erection/commissioning programme not achieved owing to non-availability of tools and plants, manpower and consumables by the contractor or any other reason attributable to the contractor.

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

11.2.3 CONTRACT EXTENSION

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

11.2.4

A joint programme shall be drawn for the work to be completed during the extended contract period. Review of the program and record of shortfall as describe vide clause no. 11.2.2 shall be done during the extended period. The over run charges will be paid in proportion to the achievement of the respective month vis-à-vis the plan for the month (for assessing the performance, the agreed plan shall be reduced by shortfall attributable to the BHEL). BHEL may disallow contractor's claim for over run charges if the monthly programme as mentioned in these specifications are not made by him.

11.2.5

The part of extension attributable to the contractor, if any, in total contract extension shall be exhausted first i.e., immediately after end of grace period. This shall be followed by the extension on account of force majeure conditions, if any, and lastly on account of BHEL.

11.4.1 OVERRUN COMPENSATION

If the contract is extended beyond the contract and grace period for any reason other than those attributable to the contractor or force majeure conditions, the contractor will be compensated by payment of overrun charges at the rate of Rs. 25,000/- (Rupees twenty five thousand only) per month. Overrun compensation will be paid for the extension attributable to BHEL only. No overrun compensation will be payable for the extension on account of reasons attributable to contractor and/or force majeure conditions. Overrun compensation for eligible period shall be in proportion to the progress achieved against the plan for respective period.

11.3 PRICE VARIATION

Agreed rates shall remain firm throughout the contract period and extensions thereof. No price variation/adjustment shall be applicable for this contract.

11.4 CONTRACT VARIATIONS

1.1.1 VARIATION IN WEIGHT/QUANTITIES

Weights of various equipments, quantities of various items of work covered under these specifications & indicated in relevant appendices and rate schedule are likely to vary. For any upward or downward variation in the quantities, the rates accepted shall be applicable without any variation. Payment will be made by BHEL for the actual executed quantities.

1.1.2 ADDITIONAL ITEM

Equipments /instruments required to be erected for this work, though not limited to but are generally as per rate schedule. For any items or class of work not specified herein but required for total completion of work, the same shall be carried out as per BHEL requirement. However the payment of these items/class of work shall be regulated on the basis of mutually agreed rate arrived at by either of the following methods, which should be done prior to undertaking the work:

A. Based on rate of identical/similar items in the rate schedule
B. Based on the rate arrived from nearby items in the rate schedule

Wherever any item rate for similar type of work or nearby item rate is not existing in the rate schedule, rate will be worked out on the basis of work element or from fundamentals of estimation or existing rates in other job.

11.5 INTEREST BEARING ADVANCE

Interest bearing (@ 13.5 % per annum interest on monthly reducing balance basis) recoverable advance limited to 5% of the contract value may be paid by BHEL at its discretion depending on the merit of the case against receipt & acceptance of bank guarantee from the contractor for the amount sought. This Bank Guarantee (BG) shall be valid at least for one year or the recovery duration. In case recovery of dues does not get completed within the aforesaid BG validity period, the Contractor must renew the validity of BG or submit fresh BG for the outstanding amount and remaining recovery period. BHEL is entitled to make recovery of the entire outstanding amount in case the Contractor fails to comply with the BG requirement as above.

Recovery of dues will be made minimum @ 10% of the admitted gross running bill amount from the first applicable running bill onwards till entire due (principal plus interest) is recovered. In the event sufficient time duration is not left for recovery @10%, the rate of recovery shall be suitably enhanced so that entire due is recovered within the contract period (including extensions granted or foreclosure if any).

11.6 DEFINITION OF WORK COMPLETION

The contractor's scope of work under these specifications will deem to be completed in all respect, only when all the activities are completed satisfactorily and so certified by BHEL site in charge. The decision of BHEL in this regard shall be final and binding on the contractor.

Section-12

Special Conditions of Contract

12.0 TERMS OF PAYMENT

12.1 PAYMENT FOR WORK COMPLETED

12.1.1

The contractor shall submit his monthly on account bills with all the details required by BHEL on specified date every month covering progress of work in all respects and areas from the 25th of previous calendar month to 24th of the current month.

12.1.2

Clause 2.6 of general conditions of contract shall be referred to as regards mode of payment, and measurement of the work completed.

12.1.3

Release of payment in each running bill will be restricted to 95% of the value of work admitted, as per the percentage break-up for the stage of work completion stipulated vide clauses hereinafter. The 5% thus remaining shall be treated as amount payable but not due and shall be on account of workmanship guarantee of work executed. The same is to be released after completion of the defect liability period of **15 months** from the date of completion of entire work as certified by BHEL engineer. However this amount may be released on submission of bank guarantee of equal amount and tenure in prescribed format and the BG shall be kept valid till completion of such guarantee period and an additional six months claim period.

12.1.4

The payment for running bills will normally be released within around 30 days of submission of running bill with measurement sheets. Contractor shall make his own arrangement for making payment of impending labour wages and other dues in the meanwhile.

4.1 STAGES OF PROGRESSIVE PRO-RATA PAYMENTS

Sl No	Sections of rate schedule	Calibration	Erection	Testing / Commissioning	Final Painting
1	A.1 to A.17	NA	50%	45%	5%
2	B.1 to B.18	30%	30%	40%	NA
3	C.1 to C.8	NA	95%	NA	5%
4	D.1 to D.14	NA	80%	20%	NA
5	E.1 to E.4	NA	NA	100%	NA
6	F.1	NA	NA	100%	NA

12.3 MEASUREMENT OF PAYMENT

12.3.1

In rate schedules, unit rates/lumpsum rates are called for erection, calibration, testing and commissioning for various equipments, device and instrument and payment shall be made accordingly.

12.3.2

For all payment purpose, measurement shall be made on the basis of physical measurement. Contractor shall make physical measurement in presence of BHEL engineer. Contractor shall maintain records for utilization of material system-wise.

12.3.3

The contractor shall return all the surplus, scrap and servicable materials to BHEL's stores as per the instruction of engineer

12.3.4

All the cables returned to stores should carry an aluminium tag indicating the size and type of cables. Cable of more than five-meter length is termed as "serviceable material".

12.3.5

Any item returned to stores shall be clearly identified and tagged for its serviceability or any defects in the returned items.

12.3.6

Wherever additional instrumentation work has to be carried out for performance guarantee test, the same has to be executed by the contractor as per the applicable rates already provided in the rate schedule.

12.3.7

Spares, surplus quantity, erection contingency materials will not be paid for unless the same has been consumed in place of regular item of measurable work as per the rate schedule.

Where the payment is made on the basis of item rate, actual executed quantity measured jointly shall only be paid for.

12.3.8

BHEL engineer's decision regarding stage of payment corresponding to progress of work, calculation of weight etc. Will be final and binding on the contractor.

12.3.9

Wastage allowance provided elsewhere on application of cable laying will be applied on the net issued quantity. The net issued quantity is gross issue less the quantity returned. The wastage allowance will be applied at the final reconciliation stage. The payable amount will then be restricted to the net quantity after wastage allowance.

SECTION-13
SPECIAL CONDITIONS OF CONTRACT

13.0 EXTRA CHARGES FOR RECTIFICATION AND MODIFICATION

13.1
If extra works (requiring less than **24 man-hours**) for modification, rework, revamping, in brief, any work done to change the state existing to a stage desired and also fabrication, all or any, are needed due to any change in or deviation from the drawings and design of equipment, operation/ maintenance requirements, mismatching, transit damages and other allied works which are not very specifically indicated in the drawings, but are found essential for satisfactory completion of the work, are done, no extra charges will be paid. The bidders are requested to take this aspect into account and the quoted rate should include all such contingencies.

13.2
It may also be noted that if any such said extra works arise on account of the contractor's fault, irrespective of time consumed in rectification of the damage/loss, it will have to be carried out by the contractor free of cost. Under such circumstances, any material and consumable required for this purpose will also have to be arranged by the contractor at his cost.

13.3
However, BHEL may consider for payment as extra, for such of those works detailed in clause 13.1 which require more than **24 man-hours** and such payment will be regulated by the terms, conditions and stipulations contained in the clauses 13.4 to13.8 and/or 14.2.1 to 14.2.10 as the case may be. It may be specifically noted that the decision of BHEL as to whether such payment is due shall be final and binding on the contractor. It may also be noted that only those works that are identified as major and warrant extra payment and certified as such by the site engineer and accepted by the designers and/or competent authority of BHEL, will be considered for extra payment.

13.4
For extra works arising out of transit, storage and erection damages, payment, if found due, will be regulated by clauses 14.2.1 to 14.2.10.

13.5
A separately identifiable gang should carry out all the extra work, without affecting routine activities. Daily log sheets in the pro-forma prescribed by BHEL should be maintained and shall be signed by the contractor's representative and BHEL engineer. No claim for extra work will be considered/entertained in the absence of the said supporting documents i.e. Daily log sheets. It may, however be noted that signing of log sheets by BHEL engineer does not mean the acceptance of such works as extra works. All admissible claims shall be submitted to BHEL

1.1
BHEL retains the right to award or not to award any of the major repair/rework/modification/ rectification/fabrication works under clauses 13.1 to 13.6 to the contractor, at their discretion without assigning any reason for the same.

1.2
Extra works that arise on account of contractor’s fault will have to be carried out by the contractor free of cost including the supply of material and consumables

13.8
After eligibility of extra works is established and finally accepted by BHEL engineer/designer, payment will be released on competent authority's approval at the following rate.

Man-day rate for eligible extra works:
Single average man-day rate, including overtime if any, and other site expenses and incidentals, including Consumables, Tools & Plants, Tackles, Implements, Supervision, Overheads etc. for carrying out any major rework/repairs/rectification/ modification/fabrication of 8 hours as may arise during the course of erection. (Refer clauses 13.1 to 13.8 and 14.2.1 to 14.2.10) will be **Rs. 240/- (Rupees two hundred and forty only).**

No payment will be made if an item of work lasts less than 24 man-hours.

SECTION-14

SPECIAL CONDITIONS OF CONTRACT

14.0 Insurance

14.1 Marine, Storage cum Erection (MCE) Insurance and Repairing Damages

14.1.1
BHEL/client has an MCE insurance cover, inter-alia, for all the permanent project equipments/components supplied by BHEL under scope of this work by way of a transit and storage cum erection policy covering liability against damages/ losses etc.

14.2 Reporting Damages and Carrying out Repairs

14.2.1
Checking all components/equipments at siding/site and reporting to transporter and /or insurance authorities of any damages/losses will be done by BHEL.

14.2.2
Contractor shall render all help to BHEL in inspection including handling, re-stacking etc, assessing and preparing estimates for repairs of components damaged during transit, storage and erection, commissioning and preparing estimates for fabrication of materials lost/damaged during transit, storage and erection. Contractor shall help BHEL to furnish all the data required by railways, insurance company or their surveyors.

14.2.3
Contractor shall report to BHEL in writing any damages to equipments/ components on receipt, storing, and during drawl of the materials from stores, in transit to site and unloading at place of work and during erection and commissioning. The above report shall be as prescribed by BHEL site management. Any consequential loss arising out of non-compliance of this stipulation will be borne by contractor.

14.2.4
Contractor shall carry out fabrication of any material lost/damaged as per instructions from BHEL engineer.

14.2.5
BHEL, however, retains the right to award or not to award to the contractor any of the rectification/rework/repairs of damages and also fabrication of components.

14.2.6
All the repairs/rectification/rework of damages and fabrication of materials lost, if any, shall be carried out by a separately identifiable gang for certification of man-hours. Daily log sheets should be maintained for each work separately and should be signed by contractor's representative and BHEL engineer. Signing of log sheets does not necessarily mean the acceptance of these as extra works.

14.2.7
All rectification, repairs, rework and fabrication of components lost, which are minor and incidental to erection work (consuming not more than 100 man-hours on each occasion) shall be treated as part of work without any extra cost.

14.2.8
Insurance cover under this policy will generally be as per clauses 2.10.1 to 2.10.4 of General Conditions of Contract unless and otherwise specified differently in the Special Conditions.

14.2.9
In case the loss/damage is not attributable to the contractor, Payments of all extra works on account of repair / rectification / reworks of damages and fabrication of materials lost will be as per provisions of Section-13 of SCC.

4.1.1
In case the repairs/rectification/rework and fabrication of materials lost, the work has been done by more than one agency including the contractor, the payment towards extra charges will be on pro-rata basis and the decision of BHEL in this regard is final and binding on the contractor.

4.1.2
In case of theft / damage / loss of materials due to **repeated/continued instances of negligence/failure** attributable to the contractor, the expenses incurred on account of repair/ replacement of such components including BHEL's overhead expenses as applicable (presently @ 30%) in excess of the amount realized from the underwriters, if any, shall be recovered from the contractor. Recovery will be limited to Normal Deductible Franchise (DF)/Excess as per applicable Insurance (TAC) tariff guidelines for every incidence of loss/damage.

14.2.12
In case any insurance claim does not become tenable due to **willful** negligence/ damage/loss attributable to the contractor, the total cost of repair/replacement including BHEL overhead expenses shall be recovered from the contractor.

14.3 Insurance by the Contractor and Indemnification of BHEL

14.3.1

BHEL has taken third party liability insurance, indicating in the proposal for such insurance that sub-contractors will be taking part in the erection work detailed in this tender specification. However, the bidder has to bear any expenses/consequences over and above the amount that may be reimbursed to BHEL by such coverage of third party liability insurance taken by BHEL.

Such additional liability will be to cover and indemnify BHEL and its customer of all liabilities which may come up and cause harm/damage to other contractors/customer/BHEL properties/ personnel or all or anybody rendering service to BHEL/ customer or is connected with BHEL/ customer's work in any manner whatsoever. The bidders' specific attention is also invited to clause 2.10 of General Conditions of Contract.

14.3.2
Contractor shall obtain suitable statutory as well as non-statutory insurance policies for all the properties belonging to him and also for his personnel deployed at project for execution of the contract work.

SECTION-15

Special Condition of Contract

15.0 Earnest Money Deposit & Security Deposit

4.1 Earnest Money Deposit:

EMD for this tender is Rs. 1,00,000/- (Rupees one lakh only). Bidders who have already deposited One Time EMD of Rs. 2.00 lakh will be exempted from submission of any EMD now for this tender.

EMD is to be paid in **cash** (as permissible under Income Tax Act), **Pay Order** or **Demand Draft** in favour of Bharat Heavy Electricals Limited and payable at Nagpur.

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

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

ii) The bidder does not commence the work within the period as per LOI/Contract. In case the LOI / contract is silent in this regard then within 15 days after award of contract.

4.1.2 EMD shall not carry any interest.

4.2 Security Deposit

4.1.1 Security Deposit shall be furnished by the successful bidder. The rate of Security Deposit will be as below:

SN	Contract Value	Security Deposit Amount
1	Up to Rs. 10 lakhs	10% of Contract Value
2	Above Rs. 10 lakhs upto Rs.50 lakhs	1 lakh + 7.5% of the Contract Value exceeding Rs. 10 lakhs.
3	Above Rs. 50 lakhs	Rs 4 lakhs + 5% of the Contract Value exceeding Rs. 50 lakhs.

The security Deposit should be furnished before start of the work by the contractor.

4.1.2 Security Deposit may be furnished in any one of the following forms

i) Cash (as permissible under the Income Tax Act)

ii) Pay Order, Demand Draft in favour of BHEL.

iii) Local cheques of scheduled banks, subject to realization.

iv) Securities available from Post Offices such as National Savings Certificates, Kisan Vikas Patras etc.

(Certificates should be held in the name of Contractor furnishing the security and duly pledged in favour of BHEL and discharged on the back).

v) Bank Guarantee from Scheduled Banks / Public Financial Institutions as defined in the Companies Act subject to a **maximum of 50%** of the total security deposit value. The balance SD has to be remitted either by cash or in the other forms of security. The Bank Guarantee format should have the approval of BHEL.

vi) Fixed Deposit Receipt issued by Scheduled Banks / Public Financial Institutions as defined in the Companies Act. The FDR should be in the name of the contractor, A/C BHEL, duly discharged on the back.

vii) Security deposit can also be recovered at the rate of 10% from the running bills. However in such cases at least 50% of the Security Deposit should be remitted (either by cash/DD or **BG for maximum 50%** of total SD) before start of the work and the balance 50% may be recovered from the running bills.

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

ix) The Security Deposit shall not carry any interest.

NOTE: Acceptance of Security Deposit against Sl. No. (iv) and (vi) above will be subject to hypothecation or endorsement on the documents in favour of BHEL. However, BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected therewith.

4.1.3 Security Deposit may be refunded to the contractor on his request but after completion of entire contractual scope of work duly certified by construction manager of BHEL. Alternately it will be released with final bill payment.

APPENDIX-I

List of Consumable to be provided by BHEL free of Charges

1. Cable Glands
2. Cable Lugs for above 4 sq. mm. Size cables.

APPENDIX – II

LIST OF T&P TO BE PROVIDED BY BHEL FREE OF HIRE CHARGE ON SHARING BASIS

0 EOT Crane in TG hall for handling & erection (depending on accessibility of location) of panels.

While all efforts will be made for amicable sharing of the above, non-availability of the above due to any reason shall not absolve the contractor of performing his responsibilities in time. The contractor shall undertake proper planning and arrange his own handling/transport equipment as necessary.

APPENDIX-III

LIST OF MAJOR TOOLS & PLANTS AND MMD TO BE DEPLOYED BY THE CONTRACTOR

SN	Description Of Equipments	Capacity	Min. Qty
01	TIG Welding Torch Air/Water Cooled	As Per Site Requirement	As Per Site Requirement
02	Welding Transformer	As Per Site Requirement	As Per Site Requirement
03	3 Ph Distribution Board With Complete Set Up For Drawl Of Construction Power	600 Amp	2 Nos.
04	Electric Cable For Drawl & Distribution Of Construction Power	As Per Site Requirement	As Per Site Requirement
05	Hydraulic Pipe Bending Machine	As Per Site Requirement	2 Nos
06	Dead Weight Tester	0-700 Kg.	1 No.
07	Temperature Controlled Oil Bath	0-650 Deg	1No.
08	U Tube Manometer +/- 1000 mm water/ mercury column	As Per Site Requirement	2 Nos.
09	Standard Pressure Test gauges	0-6, 0-10, 0-25, 0-60, 0-100, 0-250, 0-400/600 Kg/cm^2, Vacuum Gauge –1 –0 Kg/cm2	1 Set
10	Digital Thermometer 0-150 Deg C, 0-650 Deg C	As Per Site Requirement	1 No Each
11	Glass Thermometer	0-100, 0-200, 0-300, 0-450 Deg C	1 No. Each.
12	Low Pressure Calibrator	As Per Site Requirement	1 No.
13	mA & mV source	0-100 mA 0-100 mV	3 Nos. Each
14	DC voltage source	+/-30 Volt DC	2 Nos.
15	Single Phase and 3 phase variac	5 amp	1 each
16	Primary Current Injection kit	0-1000 Amps	1 No.
17	Secondary Current Injection Kit with Timer for relay test		1 No.

APPENDIX-III

LIST OF MAJOR TOOLS & PLANTS AND MMD TO BE DEPLOYED BY THE CONTRACTOR

SN	Description Of Equipments	Capacity	Min. Qty
18	Insulation Tester (Meggar)	0-500/ 1000 Volt 0-2.5/5 kV	1 No. Each
19	Decade Resistance Box		2 Nos.
20	1 / 3 Phase Variac, 415 Volt		1 Nos.
21	4 ½ Digit Analog Millimeter		2 Nos.
22	3 ½ Digit Multimter		5 Nos
23	Grinding machines		2 nos
24	Soldering Iron	25W	3 Nos
25	Drilling machines	¼" to 1"	As reqd
26	Crimping tools		As reqd

Note:

The list of instruments/equipments to be brought by the contractor as shown above is only indicative. Any other instruments/equipments required for the execution of the work is to be necessarily arranged by the contractor. The testing/calibration instruments that are used, shall be duly calibrated in the interval prescribed by BHEL engineer from the BHEL approved agencies and test certificate to be furnished.

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APPENDIX-IV

ANALYSIS OF UNIT RATE QUOTED

SL. NO.	DESCRIPTION	% OF QUOTED RATE	REMARKS
01	SITE FACILITIES VIZ., ELECTRICITY, WATER OTHER INFRASTRUCTURE.		
02	SALARY AND WAGES + RETRENCHMENT BENEFITS		
03	CONSUMABLES		
04	T&P DEPRECIATION & MAINTENANCE		
05	ESTABLISHMENT & ADMINISTRATIVE EXPENSES		
06	OVERHEADS		
07	PROFIT		

DATE
SIGNATURE OF THE BIDDER

APPENDIX-V

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

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

DATE:

SIGNATURE OF BIDDER

APPENDIX–VI

FORMAT FOR DEPLOYMENT PLAN FOR MAJOR TOOLS & PLANTS

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

DATE:

SIGNATURE OF THE BIDDER

APPENDIX-VII

CONCURRENT COMMITMENTS

SL. NO	FULL POSTAL ADRESS OF CLIENT AND NAME OF OFFICER IN-CHARGE	DESCRIPTION OF THE WORK	VALUE OF THE CONTRACT	COMMENC-EMENT DATE	SCHEDU-LED COMPLE-TION	% COMPL-TD. AS ON DATE	ANTICIPATED COMPLN. DATE	REMARKS

DATE:

SIGNATURE OF THE BIDDER

APPENDIX–VIII

DETAILS OF SIMILAR WORK DONE DURING THE LAST SEVEN YEARS

SL. NO.	FULL POSTAL ADDRESS OF CLIENT & NAME OF OFFICER IN CHARGE	DESCRIP-TION OF WORK	VALUE OF CONTRACT	DATE OF AWARD OF WORK	DATE OF COMMENCEMENT OF WORK	ACTUAL COMPLETION TIME (MONTHS)	DATE OF ACTUAL COMPLETION OF WORK	REMARKS
1								
2								
3								
4								
5								
6								

BIDDERS SHALL ENCLOSE COPIES OF DETAILED WORK ORDER (GIVING BILL OF QUANTITIES AND SCOPE OF WORK) AND COMPLETION CERT IFICATE IN SUPPORT OF THIS STATEMENT.

DATE

SIGNATURE OF TENDERER WITH SEAL