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

No. BHE/PW/PUR/TRT-STG/506

FOR

RECEIPT OF MATERIALS FROM BHEL / CUSTOMER STORES / STORAGE YARD, HANDLING AT STORES/STORAGE YARD, SITE OF WORK, TRANSPORTATION TO SITE OF WORK, ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING AND HANDING OVER OF STEAM TURBINE, TURBO-GENERATOR (INCLUDING ITS RECEIPT FROM TRAILER, HANDLING, LIFTING & PLACEMENT ON FOUNDATION), CONDENSER WITH R.E. JOINTS & BUTTERFLY VALVES, TG INTEGRAL PIPING, EXTERNAL/ REGENERATIVE PIPING, EQUIPMENTS / TANKS / VESSELS, HP & LP HEATERS, DEAERATOR WITH ASSOCIATED PLATFORM, HP & LP BYPASS SYSTEM, POWER CYCLE PUMPS WITH ASSOCIATED AUXILIARIES ETC. INCLUDING BOUGHT OUT ITEMS, PEM PACKAGES LIKE CENTRAL LUBE OIL SYSTEM, MISC. PUMPS, COLTS, DEBRIS FILTERS, PLATE HEAT EXCHANGER, MISC. CRANES & HOISTS, SELF-CLEANING STRAINERS ETC. AND DG SET OF 1x250 MW UNIT # 8

AT

TROMBAY THERMAL POWER GENERATING STATION

TATA POWER COMPANY LTD.

TROMBAY, MUMBAI

MAHARASHTRA

PART –I

(TECHNICAL BID SPECIFICATION, NOTICE INVITING TENDER & GCC)

BHARAT HEAVY ELECTRICALS LIMITED
(*A GOVERNMENT OF INDIA UNDERTAKING*)
POWER SECTOR : WESTERN REGION
345, KINGSWAY : NAGPUR 440 001

CONTENTS

LEGEND:

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

#: INCLUDED IN HARD COPY OF TENDER SPECS. PART-I. SOFT COPY HOSTED AS A SEPARATE FILE TITLED 'NIT-GCC-506' IN WEB PAGE.

@: ISSUED AS SEPARATE BOOKLET IN HARD COPY AS PART-II. SOFT COPY HOSTED IN WEB PAGE AS SEPARATE FILE TITLED 'PRICE-BID-506'

* ENCLOSED AT THE END OF TENDER SPECIFICATION PART-I. SOFT COPY HOSTED IN WEB PAGE AS TWO SEPARATE DOWNLOAD FILES.

BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR - WESTERN REGION
345-KINGSWAY, NAGPUR - 440 001

SUB: TENDER SPECIFICATION ISSUE DETAILS

TENDER SPECIFICATION No. BHE/PW/PUR/TRT-STG/506

JOB: RECEIPT OF MATERIALS FROM BHEL / CUSTOMER STORES / STORAGE YARD, HANDLING AT STORES/STORAGE YARD, SITE OF WORK, TRANSPORTATION TO SITE OF WORK, ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING AND HANDING OVER OF STEAM TURBINE, TURBO-GENERATOR (INCLUDING ITS RECEIPT FROM TRAILER, HANDLING, LIFTING & PLACEMENT ON FOUNDATION), CONDENSER WITH R.E. JOINTS & BUTTERFLY VALVES, TG INTEGRAL PIPING, EXTERNAL/ REGENERATIVE PIPING, EQUIPMENTS / TANKS / VESSELS, HP & LP HEATERS, DEAERATOR WITH ASSOCIATED PLATFORM, HP & LP BYPASS SYSTEM, POWER CYCLE PUMPS WITH ASSOCIATED AUXILIARIES ETC.. INCLUDING BOUGHT OUT ITEMS, PEM PACKAGES LIKE CENTRAL LUBE OIL SYSTEM, MISC. PUMPS, COLTS, DEBRIS FILTERS, PLATE HEAT EXCHANGER, MISC. CRANES & HOISTS, SELF- CLEANING STRAINERS ETC. AND DG SET OF 1x250 MW UNIT # 8

AT

TROMBAY THERMAL POWER GENERATING STATION

TATA POWER COMPANY LTD.

TROMBAY, MUMBAI

MAHARASHTRA

EARNEST MONEY DEPOSIT: Please see Section-15 of Special Conditions of Contract.
LAST DATE AND TIME FOR
RECEIPT OF OFFERS: **Please see Notice Inviting Tender and Applicable Corrigendums**

THESE TENDER SPECIFICATION DOCUMENTS CONTAINING **PART-I** AND **PART- II** ARE ISSUED TO:

M/s. ……

……

For Bharat Heavy Electricals Limited

DGM (Purchase)
Place: Nagpur
Date:

BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR - WESTERN REGION
345-KINGSWAY, NAGPUR 440 001

PROCEDURE FOR SUBMISSION OF SEALED TENDERS

THE TENDERER 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". **EMD SHALL NOT BE INCLUDED IN THIS COVER.**

THESE TWO SEPARATE COVERS-I AND II (PART-I AND PART-II) SHALL TOGETHER BE ENCLOSED IN A THIRD ENVELOPE (COVER-III) ALONGWITH REQUISITE EMD AS INDICATED EARLIER AND THIS SEALED COVER SHALL BE SUPERSCRIBED AND SUBMITTED TO ADDL. GEN MANAGER (PURCHASE) AT THE ABOVE MENTIONED ADDRESS ON OR BEFORE THE DUE DATE AS INDICATED.

THE QUALIFIED TENDERER WILL BE INTIMATED SEPARATELY ABOUT THE STATUS OF THEIR OFFER.

TENDERER ARE REQUESTED TO MAKE SPECIFIC NOTE OF THE FOLLOWING CONDITIONS:

1. CONTRACTOR SHOULD HAVE ADEQUATE RESOURCES INCLUDING MAJOR T&P AT HIS DISPOSAL FOR THIS JOB.

2. CONTRACTOR SHOULD HAVE SOUND FINANCIAL STABILITY.

3. TENDERER SHOULD MEET QUALITY REQUIREMENT REGARDING WORKMANSHIP, DEPLOYMENT OF PERSONNEL, ERECTION TOOLS AND NECESSARY INSPECTION, MEASUREMENT & TESTING INSTRUMENTS.

4. ALL INFORMATION AS CALLED FOR IN VARIOUS APPENDICES AND CLAUSES OF TENDER SPECIFICATION SHOULD BE FURNISHED IN COMPLETENESS. PLEASE REFER THE CHECKLIST.

5. THE TENDERER, SHALL OBTAIN CLARIFICATION ON TENDER IF ANY, BEFORE SUBMITTING THEIR OFFER.

6. OFFERS MUST BE SUBMITTED WITHOUT ANY DEVIATION.

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.

PROJECT INFORMATION

1.00.00 **BACKGROUND**

TATA Power Company Limited as part of expansion plan is installing the 1x250 MW Unit#8 Trombay Thermal Power Generating Station within the existing premises of their Trombay Thermal Generating Station at Trombay, Mumbai (Maharashtra).

1.01.00 **Location and Approach**

The site is located at Trombay, Mumbai and is connected by Rail to Kurla Marshaling Yard. Trombay is accessible by Road & Rail.

1.02.00 Climatic conditions:

(a) Maximum dry bulb temperature – 36.7 Degree Centigrade
(b) Minimum dry bulb temperature – 18.3 Degree Centigrade

1.03.00 Relative humidity:

(a) Maximum during monsoon – 100 %
(b) Minimum during December to January – 22 %

1.04.00 Rainfall : Annual average rainfall is about 2099 mm (Most of which occurs during the monsoon season from June to September)

1.05.00 **Wind Data**: Basic wind speed-44 M/sec (in accordance with IS 875-1987 (Parts-3)

1.06.00 **Seismic conditions** : The proposed site is located in seismic ZONE III as per the Indian Standard IS 1893 and importance factor of 1.5

1.07.00 **Air Quality**: Atmosphere polluted with industrial gases and wastes because of proximity to petroleum refineries and fertilizer complex.

Contractor is advised to visit the site and appraise himself about the conditions of site, Layout and infrastructure available in the area for fulfilling their commitments under the contract.

Check List (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 & Fax No.	Mr./Ms Tel No. Fax No.		
3	Nature of the firm	PROPRIETARY / PARTNERSHIP / LIMITED CO.		
4	Details of EMD Please Indicate whether One Time EMD or, Only for this Tender	DD No. …… DD Date…… Name of Bank…….. Amount: 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 conditions stipulated?	**Yes** (vide Document 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
9	Details of concurrent jobs are furnished (**Appendix-IX)**		Yes	No
10	Headquarters organization is furnished		Yes	No
11	Proposed site organization is furnished		Yes	No
12	Names and particulars of directors/partners are furnished		Yes	No
13	Financial status of the firm (**Annexure 'A' of GCC**) is furnished		Yes	No
14	**Profit & Loss Account** for preceding three years is furnished		Yes	No
15	**Latest Certificate by Bidder's Banker for Overdraft & BG Limits** is Furnished (Certificate shall not be older than six months from the Last Date for offer submission)		Yes	No

Check List (Vide Para 1.3 Of Section-I of General Conditions Of Contract)			
16	Latest copy of **IT Return** along with copy of **PAN Card** are Furnished	Yes	No
17	Month-wise **Manpower Deployment Plan** (**Appendix – VII**) is furnished	Yes	No
18	**Analysis of Unit Rates** quoted (**Appendix-VI**) is furnished	Yes	No
19	**Month-wise deployment plan for major T&P** (**Appendix-VIII**) is furnished	Yes	No
20	Whether all the pages of the Tender Specification 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 & Local Conditions	Yes	No
23	Safety Requirement of this work in a Running plant Premises has been understood.	Yes	No
24	Erection and Commissioning programme furnished	Yes	No
25	**List of Jobs completed** in last seven years is furnished (**Appendix-X**)	Yes	No
26	Whether **copies of detailed Work Orders (with BOQ)** and **Completion Certificates** in support of above furnished	Yes	No
27	Generator Stator Lifting and placement Programme.	Yes	No
28	Whether contractor has left any job unfinished? If so, give reasons.	Yes	No
29	Whether any client has terminated the contractor's work before completion? If so, furnish reasons for the same	Yes	No

Note: strike off or tick **'yes'** or **'no'**, as applicable

Date: Signature of Bidder

DECLARATION BY BIDDER'S AUTHORIZED REPRESENTATIVE

I, HEREBY CERTIFY THAT ALL THE INFORMATION AND DATA FURNISHED BY ME WITH REGARD TO THE TENDER SPECIFICATION NO. **BHE/PW/PUR/TRT-STG/506** ARE TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE. I HAVE GONE THROUGH THE SPECIFICATIONS, 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 TENDERER AND A VALID POWER OF ATTORNEY TO THIS EFFECT IS ALSO ENCLOSED.

AUTHORISED REPRESENTATIVE'S SIGNATURE WITH
NAME AND ADDRESS

DATE:

TENDERER'S NAME AND ADDRESS

CERTIFICATE OF NO DEVIATION

TENDER SPECIFICATION NO. BHE/PW/PUR/TRT-STG/506

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 BIDDER

DATE:

SECTION-3
OFFER OF THE BIDDER

To,
DGM (PURCHASE)
BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR - WESTERN REGION
SHREEMOHINI COMPLEX
345, KINGS WAY
NAGPUR 440 001

DEAR SIR,

I/WE HEREBY OFFER TO CARRY OUT THE WORK DETAILED IN TENDER SPECIFICATION NO. **BHE/PW/PUR/TRT-STG/506** OF 1X250 MW # 8, TATA POWER COMPANY LIMITED, TROMBAY THERMAL GENERATING STATION AT TROMBAY, MUMBAI (MAHARASHTRA) 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 TENDERERS
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 AS SPECIFIED IN THE TENDER SPECIFICATION. DETAILS OF EMD PAYMENT ARE FURNISHED IN THE CHECK LIST.

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 SBE INDICATED BY BHEL, POWER SECTOR-WESTERN REGION, NAGPUR.
OR,
WE HAVE ALREADY DEPOSITED ONE TIME EMD OF Rs. 2,00,000/- (RUPEES TWO LACS ONLY), DETAILS OF WHICH ARE FURNISHED IN THE CHECK LIST.

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 TENDERER:
DATE: ADDRESS:

WITNESSES WITH THEIR ADDRESS

SIGNATURE	NAME	ADDRESS
1.		
2.		

SECTION- 4

SPECIAL CONDITIONS OF CONTRACT

4.0 SCOPE OF WORK

The scope of work under the specification covers receipt of materials from BHEL/customer stores/storage yard, handling at stores/storage yard, site of work, Transportation to site of work, Erection, Testing, Assistance for Commissioning and Handing Over of Steam Turbine, Turbo-generator (including its receipt from trailer, handling, lifting & placement on foundation), Condenser with R.E. Joints & Butterfly valves, TG integral piping, External/ Regenerative piping, Equipments / Tanks / Vessels, HP & LP Heaters, Deaerator with associated platform, HP & LP bypass system, Power cycle pumps with associated auxiliaries etc. including bought out items, PEM packages like Central Lube Oil system, Misc. Pumps, COLTS, Debris Filters, Plate Heat Exchanger, Misc. Cranes & Hoists, Self Cleaning Strainers etc and DG set of 1x250 MW unit no. 8, Trombay Power Generating Station, Tata Power Limited, Chembur, Mumbai (Maharashtra).

4.0.1
The work covered under this specification is of highly sophisticated nature, requiring the best quality of workmanship for fabrication, engineering and construction management. The Bidder should ensure timely completion of work. The Bidder must have adequate quantity of tools, construction aids, equipments etc, in his possession. He must also have on his rolls adequate, trained, qualified and experienced supervisory staff and skilled personnel.

4.0.2
The work shall be executed under the usual conditions affecting major power plant construction and in conjunction with numerous other operations at site. The Bidder and his personnel shall co-operate with the personnel of other agencies, co-ordinate his work with others and proceed in a manner that shall not delay or hinder the progress of work as a whole.

4.0.3
All the work shall be carried out as per the instructions of BHEL engineer. BHEL engineer's decision regarding the correctness of the work and method of working shall be final and binding on the Bidder.

4.0.4
The Bidder shall at his cost perform any services, tests etc, although not specified but nevertheless required for the completion of work.

4.0.5
Contractor shall erect all the equipments as per sequence prescribed by BHEL at site. The sequence of erection, methodology will be decided by the BHEL engineers depending upon the availability of material, work fronts etc. No claims for extra payment from the Contractor will be entertained on the grounds of deviation from the methods and sequence of erection adopted in erection of similar TG sets or for any reasons whatsoever.

4.0.6
All the necessary certificates and licenses required to carryout this work are to be arranged by the Contractor expeditiously at his cost.

4.0.7
The work to be carried out under the scope of these specifications covers the complete work of loading at stores/storage yard, handling, transporting, unloading at erection site, pre-assembly, erection, alignment, hot alignment, bolting, fastening, welding, radiography, levelling, cold pulling, adjusting, Non-destructive testing, Post weld heat treatment, hydraulic test, chemical

cleaning, passivation, steam blowing, oil flushing, water flushing, air flushing, pre-commissioning tests, trial running of Equipments, Auxiliaries, Piping and other systems as per scope covered under these specifications, commissioning and all other activities till handing over of the unit. The work shall conform to dimensions and tolerances specified in the various drawings, documents etc. that will be provided during the course of installation. If any portion of the work is found to be defective in workmanship or not conforming to drawings or other specifications, 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 at the cost and risk of the contractor.

4.0.8
The terminal points as decided by BHEL shall be final and binding on the Contractor.

4.0.9
The indicative schedules of weight of major equipments given in relevant appendices are meant for providing a general idea to the Contractor about the magnitude of the work involved.

4.0.10
During the course of execution of this work, certain rework/ modification/ rectification/ repairs/ fabrication etc. will be necessary on account of feed back from various thermal power stations on units already commissioned and/or units under erection and commissioning and also on account of design discrepancies and manufacturing defects and site operation/maintenance requirements. Contractor shall carryout such rework/ modification/rectification/ fabrication/ repairs etc., promptly and expeditiously. Daily log sheets indicating the details of work carried out, man-hours, consumables used etc, shall be maintained by the Contractor and got signed by BHEL engineer every day. Claims of contractor, if any, for such works will be dealt as per clauses of Section-13, Special Conditions of Contract.

4.0.11
All tools and tackles, fixtures, equipments, materials, manpower, supervisors/ engineers, consumables etc. 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 clause.

4.0.12
The contractor shall make adequate security arrangements including employment of security personnel and ensure protection from theft, fire, pilferage, damage and loss of materials/equipments issued to him for the work. Special care will have to be taken to guard against pilferage / theft of copper tubing, brass fittings, brass valves and other costly materials.

4.0.13
All equipments shall be handled very carefully to prevent any damage or loss. No bare wire ropes, slings etc, shall be used for handling of the equipments without the specific permission of the engineer.

4.0.14
Contractor shall ensure proper housekeeping and remove all scrap materials periodically from various work area covered in the scope and deposit the same at the place earmarked for this purpose. In case of contractor's failure to do the same, BHEL reserves the right to remove scrap at contractor's cost and risk.

4.0.15
Access to site for inspection by BHEL and customer engineers shall be made available by the contractor at all times.

4.0.16
Contractor shall mobilise sufficient quantity of Concrete/Wooden Sleepers for stacking of materials in his custody.

4.0.17
The Contractor's scope ofwork is further described in the following clauses:

4.1 COLLECTION AND RETURN OF EQUIPMENTS, MATERIALS & CONSUMABLES

4.1.1
Contractor shall take delivery of the components, equipments, lubricants, chemicals, special consumables, steel etc from the storage yard/stores/sheds of BHEL/ client. The Contractor should note that the transport of equipments to erection site, assembly yards etc should be done by the prescribed route, without disturbing the other works and contractors and in the most professional manner. Special equipments such as laboratory equipments, measuring and controls equipments, special electrodes, valves, shims, packing materials for joints and seals, lubricants, actuators etc, shall be stored, when taken over by the Contractor, in appropriate manner as per BHEL's instructions.

4.1.2
The contractor shall return all parts, materials, consumables etc. remaining extra over the normal requirement with proper identification tags to BHEL stores. In case of any misuse or use over actual requirement, BHEL reserves the right to recover the cost of parts/materials used in excess or misused, with departmental charges.

4.1.3
Transportation of lube oil, Chemicals, Gas cylinders etc. from stores, is included in the scope of this contract. The contractor shall have to return all the empty and excess drums to the customer/BHEL stores. Similarly, transport of chemicals for various pre-commissioning activities/ processes mentioned in clauses herein from BHEL/customer's stores and charging of chemicals into the system for carrying out various pre-commissioning activities and processes mentioned herein and returning of remaining and/or the empty containers of the chemicals to customer/BHEL stores is the responsibility of contractor. After completion of oil flushing operation, the used oil shall be filled in empty drums and which in turn shall be returned to BHEL/customer's stores.

4.2 PREPARATION OF FOUNDATION

4.2.1
Buildings, foundations and other necessary civil works for supporting structures, equipments etc, will be provided by the customer. The checking of dimensional accuracy, axes, elevation, levels etc, with reference to bench marks of foundations and anchor bolt pits and also adjustments of foundation level, dressing and chipping of foundation surfaces of all equipments contractor/BHEL shall prepare protocols before taking over the foundations. Dressing and chipping of foundations up to around 25 mm for achieving proper levels will be within the scope of work/specification.

4.2.2
All minor foundations and anchor points required for installing erection equipments like winches, anchors etc. are to be cast by the contractor.

4.2.3
The complete work of Secondary Grouting of equipments is included in the scope of work/ specification. Contractor shall arrange all manpower; T&P, formwork and shuttering materials, all grouting materials such as Ordinary Portland Cement, Sand, Stone Chips etc & Quick-setting-Non-shrink-Free-flow special grout mix of required specification (like Conbextra-GP-2 or equivalent).

4.2.3 .1
The Quick-setting-Non-shrink-Free-flow special grout mix shall be purchased only from the BHEL approved vendors; names of some such current vendors are as under. Contractor shall obtain updated list from BHEL before procurement action.

1. M/s Fosroc Chemicals (India) Pvt Ltd;
2. M/s Sika India Pvt Ltd;
3. M/s Pagel Concrete Technologies Pvt Ltd;
4. M/s Pidilite Industries Ltd.

In order to ensure the quality, the major grouting of equipments using any of above grout mixes shall essential be done as per the recommendations of supplier with regard to grout mix preparation and use of machinery etc under the supervision of the respective supplier. BHEL has arrangement with above suppliers for supervision services and the supervision charges for the same will be borne by BHEL. However, the contractor shall ensure readiness of equipment for grouting in all respect before such a service is requisitioned and the duration is not prolonged unduly. Any overstay required due to contractor shall be charged to the contractor with BHEL's departmental charges. Contract shall consult BHEL engineer before deciding upon the vendor for the above.

4.2.3.2
Cleaning of the foundation surfaces, pocket holes, anchor bolt pits and de-watering and making them free of oil, grease, sand and other foreign materials by soda washing, water washing, compressed air and other approved methods will be within the scope of this work.

4.2.4
BHEL will provide only shims and packer plates (either machined or plain), which are received from BHEL's manufacturing plants and go as permanent part of the equipment. Additional packer plates and shims if required will have to be prepared by the contractor out of steel plates, steel sheets to meet site requirements. Necessary steel plates for this purpose will be provided by BHEL free of cost.

4.2.5
The contractor shall carry out scrapping and matching of embedded plates, permanent spacers and all the matching parts of turbine, generator, pumps and other equipments under scope wherever required. The support and sole plates matching and concrete surface bedding is also covered in the scope of work. The fine dressing of concrete shall be with Prussian blue-match checks.

4.2.6
Packer plates shall not only be blue matched with foundations but also inter-packer contact surfaces, contact surfaces between packer and pedestals, contact surface between packer and foundation frame etc. shall also be blue matched and required percentage contact shall be achieved by chipping and scrapping as per engineer's instructions.

4.3 EQUIPMENTS INSTALLATION – COMMON REQUIREMENTS

4.3.1
Filling of lubricants for steam turbine, turbo-generator and other rotating auxiliaries for purpose of oil flushing, initial fill up and subsequent topping up during various stages of work.

4.3.2
All works such as cleaning, levelling, aligning, hot alignment, 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, grinding, straightening, chamfering, filling, machining, chipping,

drilling, reaming, scraping, lapping, shaping, fitting-up, drilling of holes, making dowel pins, minor rectification of foundation bolts etc. are incidental to the erection/commissioning and any other work/activity which is necessary to complete the work satisfactorily, shall be carried out by the contractor as part of the work.

4.3.3
Cleaning, servicing, lubrication of actuators, pumps, headers, governing system, ESV & IV, control valves, LP bypass & HP Bypass valves, Cold Re-heat Non Return Valves with power cylinders and other valves, tanks, vessels etc. during erection and commissioning stages is in the scope of work. However, gaskets/packing/lubricants for replacement will be provided by BHEL free of cost.

4.3.4
All equipment shall be preserved and protected periodically before and after erection as per advice of BHEL engineer. The journals of steam turbine rotors, generator rotor, HT motors and other rotating machines shall be thoroughly cleaned, greased/painted with preservative agents periodically as instructed by BHEL engineer.

4.3.5
Trial run of all motors including checking direction of rotation in uncoupled condition, check alignment and re-couple the motor to driven equipment.

4.3.6
After initial trial of rotating equipments, control and power cabling for motors and other equipments/instrumentation may have to be disconnected for checking alignment and resetting/realignment/hot alignment. Contractor will have to provide services for disconnection and reconnection of control and power cables.

4.3.13
All racks or assembled units like Governing Rack, LP Bypass Rack & HP Bypass system, High Pressure LP Bypass Governing System, Cold Re-heat Non Return Valve, Seal Oil Unit, Gas Unit, Seal Oil Valve Rack, Gas Cylinder Racks etc supplied from manufacturing units will be tested in BHEL/ Customer stores or at site. This may require transportation, filling of oil, water etc in these racks for carrying out testing of these racks. Defects noticed during testing of these racks will have to be rectified by the contractor free of charges. Further, any pipeline / flanges / fittings not found assembled properly, the same have to be rectified / corrected by the contractor free of charges.

4.4 PIPING INSTALLATION

4.4.1
The scope of work in piping system (air, Gas, Water, Oil, Steam, Governing oil/Control oil, Jacking Oil etc.) will include cutting to required length, edge preparation, laying, fixing and welding of the elbows/fittings/valves etc., fixing supports/hangers/shock absorbers/ guides and restraints etc. and carrying out all other activities/works to complete the erection and also carrying out all pre-commissioning/ commissioning operations mentioned in these specifications as per engineer's instructions and/or as per approved drawings. **Weld joints and NDT requirement for all TG Integral piping, External/ Regenerating System and other pipings as applicable under tender specification shall be as per drawings/schemes and suiting to site requirement. The necessary drawings/documents for these weld joints will be provided at site during execution of work.** Indicative list of schemes of piping and their approximate weights are provided relevant **Appendix.**

4.4.2
Carrying out of piping work as per the specifications between equipments constituting terminal points, whether the terminal equipments fall within the scope of the work/specification or not,

is within the scope of the work/ specification. The contractor shall complete terminal joints at either ends, with due NDE & PWHT if applicable, for all the piping schemes covered in the scope of work.

4.4.3
The erection of equipments like Condenser R.E. Joints, Condenser Butterfly Valves, Misc. Pumps, Debris Filters, Plate Heat Exchangers and Self-cleaning Strainers etc which are including under the scope of these specifications shall also be required as reference point for erection of piping etc. to other agencies/customer at site. Contractor shall carry out erection/installation of these systems on priority as per instruction of BHEL Engineer at site. The welding with NDE & PWHT etc of terminal joints / counter flanges either joint connected to these equipments shall be carried by contractor under these specifications under instruction of BHEL Engineer. The decision of BHEL Engineer shall be final and binding on contractor.

The Erection, Welding, NDE, Supporting, Hydraulic Test etc. work of Supply, Return and other related lines of Condenser Cooling water piping and ACW System Cooling water piping interconnecting the customer terminal points (from "A" Row of TG Building) to above equipments/ systems is specifically included under these tender specifications. These piping are rubberised. The rubber lining will be carried out by other agency (supplier etc.) at site after completion of erection, welding and Hydraulic Test etc. The contractor under these specifications shall carryout the erection, welding, NDE, Hydro Test etc. at site on priority as decided by BHEL Engineer-In-charge at site. Contractor shall dismantle & re-erect the erected pipes wherever required to suit the Rubber Lining work at site as scope of work without any extra charges. Contractor shall carryout the Hydraulic Test including providing the Dummies/ Blanks with materials as scope of work. The necessary design of Dummies/Blanks will be furnished by BHEL at site. The tentative sizes of rubber lined pipeline are OD-1829mmx16mm Th (about 71.5 MT), OD-610mmx8mm Th (about 19.5 MT), OD-508 mm x 8mm Th (about 2.2 MT), OD-406mmx6.4mm Th (about 2.0 MT), OD-355.6mmx6.4mm Th (about 4.0 MT), OD-219mmx6.35mm Th (about 8.6 MT), OD-168.3mmx7.11mm Th (about 1.7 MT) and fittings items like (elbows, Bends, TEE, Flanges etc. about 10.5MT). All the piping systems weighing about 120 MT are covered under PGMA No. 80-468 (**Main Circulation Water Piping)** of "EXTERNAL PIPING/RE-GENERATIVE PIPING WITH ASSOCIATED VALVES, COMPONENTS/ITEMS, FITTINGS AND SUPPORTS ETC." described in the scope of work. The above size-wise tentative tonnage break up of piping is only to facilitate the contractor to understand the quantum of work. Contractor shall carry out the entire piping work as stated above, payments for which will be made by BHEL as per accepted piping item rate under Sl. No. 02 of Schedule of Rates & Quantities (Price Bid) for actual quantity of work executed."

4.4.4
Fit up and welding/bolting/fastening of piping to the terminal points (such as stubs, valves, flanges on terminal points/equipments, stubs on headers, battery limits etc) forming part of the scope of work/specification and stress relieving and radiography of joints so made are also within the scope of work. Permanent fasteners and gaskets will be supplied by BHEL.

4.4.5
Interconnection/Hook-up, if any, with the existing system shall form part of work. Such interconnections, hook-ups may require shut down of running plant and the relevant work has to be completed within such planned shutdowns. This may call for working with enhanced resources and on extended hours. Contractor's offer shall cover all such contingencies.

4.4.6
All drains / vents / relief / escapes / safety valve piping to various tanks/ sewage / drain canal / flash box / condenser / sump / atmosphere etc. from the stubs on the piping and equipments erected by contractor is completely covered in the scope of this tender specification.

4.4.7
The following items of work shall be incidental and forming part of piping fabrication and erection:

To locate cause of vibrations in equipments/auxiliaries/pipelines and carrying out necessary corrections in case the same is attributed to the contractor.
Fabrication and erection & welding of racks, steel supports, guides, restraints for all the piping. Steel for this purpose will be supplied by BHEL free of charge in random and running lengths.
Pre-assembly of spring suspension/hangers and shock absorber as per requirement.
Erection of steam traps, filters, flow nozzles/ flow indicators/ flow orifices other measuring elements in the piping. These may have been supplied either by BHEL or their customer. This may involve cutting of pipe lines, fresh edge preparation and welding with stress relieving wherever applicable.
Fabrication / making of bends for pipes and tubes of diameter up to 65mm.
Matching of all fittings like tees, bends, flanges, reducers valves, socket fittings, etc with pipes for welding.
Servicing of valves, Power Cylinders and actuators etc.
Cleaning of all pipes by wire brushing / blowing by compressed air.
Welding of root valves with small length of piping to the pressure, flow and level tapping points on piping or flow nozzles/orifices/metering/ measuring elements fixed on piping.
Welding of blanks with stress relieving if required on a temporary basis.

4.4.8
Pipelines will be field routed as per schemes/ suggestive layout or as per the instructions of BHEL engineer. Pipes & tubes will be supplied in random lengths and running lengths. The contractor shall have to lay the piping after carrying out the necessary fabrication, edge preparation, routing etc to suit site requirement in best professional manner.

4.4.9
As far as possible pre-assembly shall be done. The pipe laying shall be carried out from the available terminal point/points or any other area between the terminal points. The erection can be carried out on temporary supports to obtain proper alignment and welding. After fixing the permanent supports, all the temporary supports shall be removed. The alignment, distances and loading of the supports shall be checked and the required settings to be ensured as per requirement.

4.5 CONDENSER INSTALLATION

4.5.1
The condenser will be despatched in loose parts mainly comprising of bottom plates, dome valves, front and rear water chamber, front and rear water boxes, side walls, hot well, spring elements, support plates, air extraction pipes, baffles, stiffening rods and pipes etc. The condenser is to be assembled at site in position by welding the different parts. Condenser tubing and tube expansion (roller expansion) is to be done at site by the contractor, after taking due care to clean all the tube holes. After final alignment and levelling of turbine exhaust and condenser, the same has to be welded to the exhaust position of LP exhaust as per the sequential welding procedure.

The Condenser Tubes are Welded Titanium Grade-2 material. The condenser tubes shall be provided by customer and further works of collection from customer's stores/storage yard, insertion, trimming, well-mouthing, retuming of excess / unused tubes to customer etc. shall be carried out by contractor under these specification.

4.5.2
Before insertion of tubes, the contractor shall clean the holes in the tube plates and tube support plates to remove paint, corrosion spots, oxide scales etc. Usage of suitable cleaning agent may also be required which has to be supplied by the contractor.

4.5.3
The tubes shall be expanded using an Automatic Electronic Torque Controlled Tube Expanding unit/Pneumatic Tube Expander and as per drawing requirement procedure/ instruction of BHEL Engineer at site. Tube expansion shall be checked with dial bore gauge. The total set up including tube expanders and tube cutting tools etc. for carrying out the complete condenser tube expansion works shall be provided by the contractor.
4.5.4
The contractor shall carry out the condenser neck welding with LP cylinder exhaust hood only after final installation of LP casing. Neck welding shall be subjected to specified non-destructive testing.

4.5.5
The hydrostatic testing of steam space and hydraulic testing of water space up to the terminal point after assembly of water boxes are also included in the scope.

4.5.6
Work of painting of condenser surfaces in various area and at various stages of work are specified elsewhere in these specifications.

4.6 GENERATOR STATOR LIFTING & PLACEMENT

4.6.1
The Generator Stator, weighing 218 Metric Tonnes (approx.), will be despatched to site by Road on trailer. The customer's EOT (capacity 80/25 Tonnes) in TG hall shall not be suitable for lifting of Generator Stator and this Generator Stator shall be lifted by Strand and Jacks / Lift & Shift arrangement method. The Scope of contractor shall take complete responsibility and carry out the liaison and follow up with transporters, filling of ditches/ levelling etc. for marching of trailer to unload at suitable location/point of lifting near the TG building, Shifting/dragging of Generator Stator by providing required arrangements like rails/plates/sleepers etc. (as per requirement), arranging the Strand And Jacks/Lift & Shift arrangements & their assembly / installation with expert supervision till lifting & placement of Generator, making resting Foundations/Footings to suit the installation of his Strand and Jack arrangements (as required) and Lifting & Placement of Generator Stator to required /designed foundation/elevation.

4.6.2
Contractor shall plan all his activities / operations so as to avoid the delay in unloading and releasing the transporters Carrier/trailer. For any demurrage Charges by Transporter / Customer on account of delay in Handling, Unloading from Trailer after arrival at site shall be the responsibility of Contractor. The all above complete works of receipt from trailer, unloading, shifting, Lifting & placement to required foundation /elevation of Generator Stator is the part of scope of work under this contract.

4.6.3
The Generator Stator will have to be lifted from space out side the "A" row of TG building and between A-5 & A-6 columns. Lifting and placement of Generator Stator from this side may require to hold casting of certain civil foundations like CW Pit, Oil Purifier, DOT, COT and TG hall column structural bracings etc., Contractor shall visit site and discuss his plan with Customer & BHEL Engineer at site and submit his plan of Generator Stator lifting along with Technical Bid. Contractor shall deploy his above

Generator Stator lifting **Strand and Jack arrangements** & other resources well in time to suit the site requirement so as to lift & place it on required foundation in minimum possible time. **Contractor is advised to visit the site and plan the arrangements required to be deployed at site for this work.**

Some of the renowned agencies who can provide strand & jack lifting arrangement are **M/s Fagioli PSE India Pvt. Ltd. (203, Krishna Bhavan, Govandi Station Road, Deonar, Mumbai-400088, Tel. No. 022-25564388, Fax No. 022-25562565); M/s Freight Wings (P) Ltd. (309, Rex Chambers, Walchand Hirachand Marg, Ballard Estate, Mumbai-400001, Tel. No. 022-2263 1714/2261 9988); M/s Dorman Long Technology Ltd. (233-Bharat Industrial Estate, Lal Bahadur Shashtry Marg, Bhandup (West), Mumbai-400078, Tel No. 022-25961960, Cell No. 09820192807); M/s Basu & Basu Engineers (Pvt.) Ltd. Kolkata, Tel. No. 033-24642967/24664069, Fax No. 033-24664621 and M/s Lift & Shift India Pvt. Ltd. (96-Chembur Mankhurd Link Road, Mumbai-400043, Tel No. 022-2548 4180, 2556 0101, Fax No. 022-2556 3573, e-mail projects@liftandshift.co.in).**

Contractor may engage **any of the above-named agencies or any other competent agency** known to contractor for this lifting activity. Generator Stator shall be required to be lifted and put on foundation within one week time after availability of material and other essential inputs, and clear the holds for further civil & structural works. All above shall be the part of scope of work and progressive payment for same shall be made per **clause 12.1.1** as per section-12 of tender specification.

Lifting of Generator Stator by Jack and Sleeper/sand bag or such other methods is not permitted.

4.6.4

The Generator shall have to be placed on designed foundation at an elevation of about 15.8 Meters between “A” & “B” row of TG building and have to be lifted from about Zero meter level out side the TG hall other than shifting/dragging of Stator from point of unloading to point of lifting (if necessary and this is also the scope of work, refer clause 4.6.1). To facilitate the contractor to understand the lifting Trunion arrangement, dimension of stator and fixing of lifting slings etc, **the drawing No.0-139-38-01096 (Lifting arrangement) and drawing No. PE-DG-254-100-M005 (T.G. Hall Equipment layout Plan at 15.80 M) is attached with Tender Specification**.

4.6.5

Immediately after completion of Generator Stator lifting work, Contractor shall dismantle his Strand and Jack arrangements and vacate the holds within a week time to enable customer to proceed with further works of civil foundations and structural works kept under hold for Generator Stator lifting.

4.7 HANDLING OF HEAVIER EQUIPMENTS

Heavy and voluminous Equipments/consignments like HP Turbine module, IP Turbine module), LP Rotor, LP turbine (Inner-Outer & Inner-Inner) Lower half casing, LP turbine (Inner outer) Upper half casing, Generator rotor, Brushless Exciter, HP & LP Heaters, Deaerator Sections, DG set etc. along with other Equipments shall be handled carefully. Contractor shall have to arrange his own Tools & Tackles, Trailer of suitable capacity including additional suitable capacity lifting Crane and any other arrangement required to handle right from collection of materials from BHEL/Customer store yards/stores, transportation to site of works and erection & their placement on respective elevation/foundation. BHEL shall not

provide any T&P other than those specified for the specific work as relevant Appendix and other relevant clauses of tender specification.

4.8 INSTALLATION OF DEAERATOR, HP & LP HEATERS ETC.

4.8.1
BHEL/Customer shall not provide any lifting & placement T&P and Crane etc. arrangement for lifting, placement and assembly of FST sections with deaerator at its designed foundation & elevation (Approx. 21.30 M in D-E Bay. Contractor shall have to make his own arrangements and carry out the lifting, placement and assembly/erection works of FST sections with Deaerator and associated components on priority immediately after availability of front/foundations and materials at site.

4.8.2
Erection of Permanent approach platform and ladders etc for De-aerator and FST is in the scope of work. The structural steel and other members will be supplied in random length/size & will have to be cut to required size and profile as incidental to work.

4.8.3
HP Heaters (Horizontal Type), LP Heaters (Horizontal Type) are to be located in D-E Bay of TG Building at their designed foundations which are at elevations of 15.8 m & 09.30 m respectively. The customer's EOT crane 80/25T is located in A-D Bay of TG Building and as such this EOT crane may not have direct accessibility /approachability to handle and place these equipments to their foundations. Contractor may make use of this EOT crane as per prior approval of BHEL/Customer engineer subject to its readiness and approachability to carry out lifting and placement of these equipments to nearest location by using additional platform etc. along with dragging arrangements, wherever required. Contractor shall make his own arrangement of such requirements for shifting/dragging/making additional platforms etc. to place and assembled/ install these equipments to their respective designed foundations & elevations as part of scope of work. BHEL/Customer shall not provide any additional arrangements/infrastructure for this purpose.

LP heater-1 is to be mounted & assembled/erected inside the Condenser at elevation of about 10.50 m.

4.8.4
Boiler feed pumps with Auxiliaries are to be installed/erection between D-E Bay of TG Building at an elevation about 00.30M. Customer has got plan of 25T capacity EOT Crane for maintenance purpose of these Aux. in D-E Bay. Contractor may make use of this EOT Crane for erection of these equipments on its readiness and with prior approval of BHEL / Customer engineer at site. However till such time the above EOT crane is made ready, contractor shall make alternate arrangement for placement and installation of these equipments as part of scope of work so that the progress of work is not affected.

4.9 HYDROSTATIC TESTING, PRESERVATION AND OTHER TESTS

4.9.1
Contractor shall carry out the following tests required to complete the erection and commissioning of the TG Set:

(1) Hydraulic testing of individual equipments like condenser, coolers, heaters, other auxiliaries, equipments and piping systems. Required capacity Hydraulic test pump/Fill pump and other necessary arrangement shall be provided by contractor to carry out

hydraulic testing, Chemical cleaning/Flushing etc. of the equipments and piping as part of scope of work under this tender specification.

(2) Ultrasonic test

(3) Dye-Penetrant test

(4) Magnetic Particle Test.

All above facilities (Men, Materials, Equipments, Consumables etc.) with operating engineer/experienced person and proper approach wherever required shall be provided by the contractor for satisfactory completion of the above tests.

4.9.2
Contractor shall lay all necessary temporary piping, welding, fabricate chemical mixing tank, supports, install pumps, valves, pressure gauges, electric cables and switches etc, required for the Hydro test, Air leak test, Chemical cleaning, Steam blowing etc.. After the test is over, all the temporary piping, pumps, etc will be removed. It may also specifically be noted that servicing, erection and dismantling of piping and equipments for conducting above tests will be done by the contractor. No separate payment shall be made for this temporary piping work for above purpose. **BHEL will provide only temporary piping and valve materials. Contractor shall provide Chemical cleaning/flushing/circulation pumps, Hydraulic test pumps of required capacity along with all other required arrangements of control panel, Motor Starters, cables, switches etc. as scope of work.**

4.9.3
All the above tests shall be repeated till all the equipments, piping and systems satisfy the technical and statutory requirements. All related works form part of the scope.

4.9.4
Suitable welding and stress relieving of temporary blanks or suitably fixing temporary blank flanges with gaskets and fasteners and welding and providing suitable de-aeration/ venting /drain points with valves as per BHEL engineer's instruction, for performing hydro test of piping is within the scope of work. Required valves, fasteners, blank flanges, blanks or steel for blank flanges will be provided by contractor. After completion of hydraulic test, welded blanks shall be cut and removed, weld burrs ground finished and cavities/scars to be repaired by weld deposit and finished ground as per BHEL engineers' instruction.

4.9.5
Hydro test of piping may have to be repeated several times to meet technical and statutory requirements before application of insulation.

4.9.6
While conducting hydraulic test of steam lines, water lines, oil lines either individually or grouping a few lines or in portions. Blanks/spools may have to be put up at terminal points, strainers, walls, flanges etc. After conducting the tests, the blanks shall be removed and the lines restored. Also interconnecting piping between boiler and turbine, the hydraulic test may have to be done section wise and some-times piping of other agencies may have to be combined. Contractor shall carry out all such incidental work to satisfactorily conduct the hydro test. Wherever work is involved in the terminal points, Contractor shall carryout the same as per instruction of BHEL engineer. The decision of BHEL engineer is final and the same is binding on the contractor.

The contractor shall carry out any other tests as desired by BHEL engineers on erected equipment covered in the scope of this contract during testing and commissioning to demonstrate the satisfactory completion of any part or whole of work performed by the contractor.

4.10 PRE-COMMISSIONING TESTS, COMMISSIONING AND POST COMMISSIONING

4.10.1
Commissioning of the TG equipments with associated Aux. and other Equipments with auxiliaries shall involve the following tests and activities of the equipments erected:

(a) Trial run of Boiler Feed Pumps, CE.P., Booster Pumps, Vacuum Pumps, Misc. Pumps, Central Lube oil system pumps, DG set etc. and other equipments like Misc. Cranes & Hoists etc. and other various rotating machineries / pumps as per tender specification.

(b) Trial run of motors/ drives for various auxiliaries.

(c) Hydraulic Test, Chemical Cleaning/Flushing, Oil flushing of lube oil system, Governing oil system/Control oil system, Seal oil System, Air cleaning/blowing of pipelines, closed systems, Tanks and Vessels.

(d) Flushing of all pipelines by air/oil/water/Chemicals/steam as the case may be.

(e) Servicing of all valves, Hydraulic Power cylinders, ESV, HP & LP Bypass valves, CRHNRV and fittings.

(f) Manual/mechanical cleaning of Oil tanks, Deaerator, FST, Suction Strainers / Filter elements of CEP, BFP, Booster Pump, Misc. Pumps, Flash Tanks, Misc. Tanks etc., Plate Heat Exchangers, HP & LP Bypass Governing/control oil System tanks and other various equipments & tanks /vessels erected by the contractor. This may have to be repeated several times during the commissioning process.

(g) Chemical cleaning of piping systems, Deaerator with FST, Misc. tanks, Flash Tanks etc. as per requirement. Contractor shall carry out disassembly and reassembly of vulnerable components like deaerator spray nozzles, gauges, instruments etc. as instructed by BHEL during this process.

(h) Putting Turbine on barring gear.

(i) Trial run/trial operation and Load test of Misc. Cranes and Hoists.

(j) Rolling and synchronisation.

(k) Full load operation.

(l) Trial operation

The above activities/tests/trial runs may have to be repeated till satisfactory results are obtained and also to meet the technical and statutory requirements. Contractor shall provide assistance to BHEL for carrying out these activities.

4.10.2
Contractor shall lay temporary pipelines with fittings and accessories etc. as instructed by BHEL engineer for the purpose of pre-commissioning and commissioning activities like Hydraulic

testing, chemical cleaning, oil flushing, steam blowing etc. of piping and other equipments as part of the scope of work. Temporary installations shall be dismantled by contractor and returned to BHEL stores as specified elsewhere in this T.S.

4.10.3
The contractor shall provide necessary assistance to facilitate/enable electrical and instrumentation testing and commissioning of equipments under this scope of work, to BHEL and their Testing & Commissioning agency.

4.10.4
The contractor shall carry out any other test as desired by BHEL engineer on erected equipments covered under the scope of this contract during testing, pre-commissioning and commissioning, to demonstrate the completion of any part or parts of work performed by the contractor.

4.10.5
In case any malfunctioning and / or defect is found during tests / trial runs such as loose components, undue noise or vibrations, strain on connected equipments etc. The contractor shall immediately attend to these defects/ malfunctioning and take necessary corrective measures. If any readjustment and realignments are necessary, the same shall be done as per BHEL engineer's instructions, free of cost.

4.10.6
The cleaning of Lube oil tank etc. is in general by wire brush / abrasive paper etc. In case of tenacious rusting spots found if any, the same shall be cleaned thoroughly mechanically by buffing wheel etc. If manual / mechanical cleaning is not proper, the cleaning by sand blasting as per instructions of BHEL engineer before and after oil flushing is responsibility of contractor.

4.10.7
The contractor shall associate for initial and subsequent fillings of gas in generator gas system as and when required till unit is handed over to Customer.

4.10.8
The contractor shall carry out air tightness test on generator gas cooling system to the satisfaction of BHEL engineer.

4.10.9
Replacing/changing mechanical/other seals of equipment, pumps etc. during commissioning stage is within the scope of work.

4.10.10
During the stages of commissioning, and till Unit is handed over, if any part of TG and auxiliaries need repair/rectification/rework/replacement, the same shall be done expeditiously and promptly by the contractor. Contractor's claim if any, for such repair/rectification/rework/ replacement etc. for reasons not attributable to the contractor, will be governed by clauses 13.1 to 13.8 of the specification. The parts to be replaced shall however, be provided by BHEL free of cost.

4.10.11
During this period, though BHEL's and customer's engineers will also be associated in the work, the contractor's responsibility will be to make available resources in his scope till such time the commissioned units are taken over by the customer.

4.10.12
In case any malfunctioning and/or defects are found during tests, trial run such as loose component, undue noise or vibration, strain on connected equipment etc., The contractor shall immediately attend to these defects/ malfunctions and take necessary corrective measures. If any readjustment or realignment is necessary, same shall be done as per BHEL engineer's instruction.

4.10.13
The pre-commissioning activities will start prior to Lube oil, Governing/ Control oil flushing, Seal Oil of the TG and various trials, commissioning operations shall continue till the TG is handed over to customer. Simultaneous commissioning checks, activities will be in progress in various areas like trial run of various equipment, checking of equipment erected, making ready for trial runs, filling up of lubricants, chemicals etc. All these works need specialised gangs including electricians, Instrument Technicians, Fitters, in each area to render assistance to BHEL commissioning staff. Contractor shall earmark separate manpower for various commissioning activities. This manpower shall not be disturbed or diverted. The mobilisation of these commissioning gangs shall be sufficient so that planned commissioning activities are taken up in time and also completed as per schedule and the work is to be undertaken round the clock if required.

4.10.14
Contractor shall cut open works if needed as per BHEL engineer's instructions during commissioning for inspection, checking and make good the works after inspection is over, without any extra payment.

4.10.15
After the start of commercial operation of machine, commissioning activities will continue. It shall be the responsibility of contractor to provide following manpower along with supervisor as part of commissioning assistance for a period of three months.

1) Supervisor	2 Nos.
2) Pipe fitter/Millwright fitter	2 Nos.
3) Welder	2 Nos.
4) Rigger	2 Nos.
5) Electrician/instrument technician	1 No. each
6) Unskilled worker	6 Nos.

4.10.16
The above figures shows only minimum required over and above labour required for completing pending erection and commissioning works and clearing of punch lists. Contractor has to provide number of personnel and other resources as per work demand.

4.10.17
It shall be specifically noted that above employees of the contractor may have to work round the clock along with BHEL commissioning engineers.

4.10.18
During commissioning, opening of valves, changing of gaskets, checking, realigning of rotating and other equipment, attending to leakages in piping, tanks etc. and adjustments of erected equipment may arise. Valves shall be serviced and lubricated to the satisfaction of BHEL engineer during the erection and commissioning as per BHEL engineer's instructions.

4.10.19
It is the responsibility of the contractor to provide for necessary resources till the completion of work under these specifications, even in case erection, testing and commissioning of the TG and other equipments are delayed due to reasons not attributable to the contractor.

4.11 WELDING AND HEAT TREATMENT

4.11.1
Removal of welding slag and burrs by hand files, with brushes and/or flexible grinders will be carried out simultaneously.

4.11.2
On all steam, oil, instrument, gas, air (Instrument air/services air) piping, DM water piping etc. both TIG welding and subsequent arc welding or total TIG welding process is to be adopted as instructed by BHEL engineer.

4.11.3
All weld joints on piping shall be ground / filed / dressed on completion of welding and before NDE as per instructions BHEL engineer.

4.11.4
The Contractor shall procure all electrodes and filler wires of approved quality / brand as per the standards and specifications of BHEL and instruction of BHEL Engineer.

4.11.5
Contractor should purchase the electrodes as per the recommendations of BHEL engineer, welding manual, welding schedule and other relevant documents. The electrodes shall be purchased only from BHEL approved manufacturers.

4.11.6
The purchase of electrodes shall be accompanied by proper test certificate and these certificates should be submitted regularly for the scrutiny of BHEL engineer.

4.11.7
All electrodes shall be stored in a clean dry area. The storage room shall be of permanent nature and damp proof, and the room shall be exclusively meant for storage of welding electrodes and filler wires. Excepting for a vent in the top, it is not preferred to have any other opening like windows or ventilators. The temperature inside the room has to be kept in the range of 8-10^0 c above atmospheric temperature and humidity should be less than 50. This is to be accomplished by using electric heaters or infrared lamps. The storage room must be provided with hygrometer and thermometer. Temperature and humidity are to be monitored regularly. 15-20 holders, welding cables, connecting cables to equipments and other welding accessories including temporary electrical connection from construction power point to individual equipment like winches, hoisting equipment, welding generators, transformers, heat treatment equipment and other construction equipment shall be arranged by contractor.

4.11.8
All racks and other items used for storage of electrodes shall be of steel and not of wood.

4.11.9
All electrodes soon after purchase shall be offered for inspection to the BHEL engineer. Contractor shall be strictly prohibited from using electrodes not inspected/approved by BHEL engineer.

4.11.10
All welding consumables shall be issued to the welders only by authorised person who is controlled by contractor's welding engineer. The necessary baking requirements are to be ensured by Contractor's welding engineer.

4.11.11
All welders shall be tested and approved by BHEL engineer/customer before they are actually engaged on work though they may possess the requisite certificate. BHEL reserves the right to reject any welder without assigning any reasons. Statutory requirements like IBR approval for welders are to be complied with before starting of the work. If required, the welders may have to undergo Procedure Qualification test also. The decision of BHEL Engineer will be final in this regard.

4.11.12
All charges for testing of contractor's welders including destructive and non-destructive tests conducted by BHEL at site shall have to be borne by the contractor. However for initial testing of welders the test will be provided by BHEL. However, If deployed welders fails in initial testing due to lack of experience OR frequent testing of new welders, due to non-availability/non-deployment of earlier qualified/tested welders, it shall be the responsibility of Contractor to provide necessary test plates at his cost for above testing.

4.11.13
BHEL engineer is entitled to stop any welder from his work if his work is unsatisfactory for any technical reason or if there is a high percentage of rejection of joints welded by him, which, in the opinion of BHEL engineers, will adversely affect the quality of welding though the welder has earlier passed the tests prescribed. The fact that the welders have passed the test does not relieve the contractor from his contractual obligations to check the performance of the welders. Contractor shall submit a monthly performance record of all welders.

4.11.14
All welded joints shall be subject to acceptance by BHEL engineer whose decision will be final and binding.

4.11.15
Pre-heating and stress relieving before and after welding are part of erection work and shall be performed by the contractor in accordance with instructions of BHEL engineer. Contractor has to arrange for the recorders along with accessories and suitable technicians for heat treatment purpose. The temperature recorders and thermocouples shall be duly calibrated. During preheat and stress relieving operations the temperature shall be measured as per the instructions of BHEL engineers by thermocouples and recorded graphs for the heat treatment works carried out shall be the property of BHEL.

4.11.16
For the purpose of stress relieving, thermocouples have to be attached to the weld joint. The number of temperature measuring points and locations are as per the standards of BHEL. Thermocouples have to be attached using battery operated portable thermocouple attachment unit and not by manual arc welding. Contractor shall arrange sufficient number of thermocouple attachment units.

4.11.17
Wherever necessary, contractor should provide temperature indicator/temperature recorder as required by BHEL engineer for measuring preheat temperature for welding or for controlling temperature of metal for hot correction etc. Decision of BHEL engineer on method and of

checking preheat temperature or controlling temperature for hot correction and welding shall be final and binding on contractor.

4.11.18
Heat treatment may be required to be carried out at any time (day or night) to ensure the continuity of the process. The contractor shall make all necessary arrangements including labour required for the same as per directions of BHEL.

4.11.19
Heat treatment requirements shall be as per the Welding Schedules of BHEL

4.11.20
For weld joints of heavy structural items like beams, I-sections, if heat treatment is required, the same shall be carried out as part of the work.

4.11.21
Checking effectiveness of stress relieving by hardness tests (either by Poldi Hardness Tester or other approved test methods as per BHEL engineer's instruction) including necessary testing equipments is within the scope of the work/specification.

4.11.22
TIG welding process is to be used for all root pass welds in pipes. Subsequent welding after root pass can be carried out by manual metal arc welding with basic coated electrodes. For the pipe of thickness less than 6mm, the entire welding has to be carried out by TIG welding. However, BHEL site engineer will have the option of changing the method adopted. Manual arc welding shall be done following weaving technique and the width of weaving shall not exceed 1.5 time of the diameter of the electrodes.

4.11.23
Two pieces to be joined shall be individually checked for the weld edge preparation and profile dimensions and with respect to the template. Dye penetrant check shall be carried out on edge prepared surfaces at random. The percentage shall depend on piping system as specified by BHEL engineer.

4.11.24
Joint fit up will be a stage for inspection.

4.11.25
All joints shall be offered for visual inspection after root run. Subsequent welding should be made only after the approval of root run.

4.12 RADIOGRAPHY

4.12.1
Radiographic inspection of welds shall be arranged by the contractor including all consumables like isotope camera, x-ray film, chemicals etc. Scaffolding and approaches for taking radiographs.

The contractor shall provide the necessary skilled technician and labourers for taking the radiographs. While taking radiographs, the contractor has to use proper penetrameter/ image quality indicators as instructed by the BHEL engineer. All the processed and accepted films will be the property of BHEL. In this regard, the contractor has to adhere to the safety rules/regulations laid by BARC authorities from time to time. It may please be noted that invariably the radiographic work will be carried after the normal working hours.

4.12.2
Contractor shall note that 100% radiography shall be taken on all high pressure welding till such time the welders' performance is found to be satisfactory. Subsequently, subject to consistency in welder's performance, the percentage of radiography will be based on BHEL's standard practice/code requirement. The defects shall be rectified immediately and to the satisfaction of BHEL engineer. The decision of BHEL engineer regarding acceptance/rejection of the joints will be final and binding on the contractor.

4.12.3
Wherever radiographs are not accepted, on account of bad shot, joints shall be re-radiographed and re-shots submitted for evaluation. Radiographs shall be taken on joints after carrying out repairs. However, if defect persists after first repair, as per radiograph, carrying out repairs and radiography shall be repeated till joint is made acceptable in case, the joint is not repairable, the same shall have to be cut and repaired at contractor's cost. Decision of BHEL engineer in all these matters is final and binding on the contractor.

4.12.4
100% radiography of weld joints of certain piping has to be carried out as per BHEL standards/drawings/specification.

4.12.5
It may also become necessary to adopt inter-layer radiography/MPT/UT depending upon the site/technical requirement necessitating interruptions in continuity of the work and making necessary arrangements for carrying out the above work. Necessary trained personnel shall be deployed for this purpose.

4.13 ACID CLEANING / ALKALI FLUSHING / STEAM BLOWING / OIL FLUSHING ETC.

4.13.1
Contractor shall lay temporary pipelines with fittings and accessories and also erect/commission pumps after servicing as per requirements, tanks and other installations, as a system as instructed by BHEL for the purpose of chemical cleaning, steam blowing, steam washing, steam flushing, water flushing, water washing, oil flushing etc. of piping and other equipments including **providing the Chemical Cleaning/ flushing Pumps/ equipments etc. (refer clause 5.2.5 of T.S.)** which are within the scope of work and also systems in which equipments and piping erected by contractor form a part of the scope of work. The required DM water and Steam will be provided by BHEL free of cost.

It shall be specifically noted by the contractor that all pipes for above works shall be supplied in random length and in loose condition. Contractor has to assemble and erect them as per schemes / drawings provided by BHEL. Further, flanges and bend etc. for completing the scheme shall be machined/ fabricated by the contractor at his own cost. However, plates / steel etc for the same will be providedby BHEL free of charges.

4.13.2
After the chemical cleaning has been successfully completed, dismantling of all temporary installations as instructed by BHEL is within the scope of work under this specification. The dismantled materials shall be dressed and returned to BHEL as stated elsewhere in this tender spec.

4.13.3
Preservation of the cleaned surfaces will be the responsibility of contractor under the guidance of BHEL engineer.

4.13.4
Hydraulic test of temporary piping is to be carried out as per the instructions of BHEL Engineer. Carrying out repairs, if any, is in the scope of work/specification.

4.13.5
For chemical cleaning of the piping system, contractor will have to lay temporary piping to connect the entire system irrespective of whether the equipment/system connected is in the scope of contractor or not. Decision of BHEL Engineer in this regard will be final and binding on the contractor.

4.13.6
During the initial stages of work, trenches for draining water may not be available after alkali flushing or mass flushing for discharging and emptying. Necessary low point drains and temporary piping for this will have to be provided by contractor from materials provided by BHEL.

4.13.7
Laying effluent discharge line from mixing tank (for acid cleaning or any other chemical cleaning process) as per the instructions of BHEL engineer and dismantling, servicing for preservation and handing over the same to BHEL stores after completion of the job is within the scope of work/specification.

4.13.8
Radiographic examination of weld joints on temporary pipes as required by the Engineer In-charge should be carried out.

4.13.9
Contractor shall also carry out the repairs or attend leaks etc., in the temporary piping and equipments for the above operations/activities while carrying out the above activities/ operations.

4.13.10
For chemical cleaning of system which consist of equipment/piping erected by the contractor and also equipment/piping erected by other contractors of BHEL/customer's contractor has to arrange for workers and supervisory staff as required supplementing/complimenting the labour and supervisory staff mobilised by other agencies for chemical cleaning of the portion of equipment erected by them in the system. Decisions on the strength of gangs and supervisory staff for deployment of labour and allocation of work for them at site, by BHEL engineer is final and binding on the contractor.

4.13.11
Contractors quoted rate shall be inclusive of fabrication, cost of consumables, erection, dismantling of temporary piping and servicing of the equipments and valves and handing over to BHEL. No separate payment on this account shall be entertained.

4.13.12
After acid cleaning/pickling of lubricating system (including oil piping of lube oil system, Seal oil system, oil tank and other fittings) of rotating machines, oil flushing for lubricating systems, HP & LP Bypass Governing/Control oil systems etc. as per instructions of BHEL Engineer shall be carried out. Cleaning of oil tank of lubricating oil system of rotating machineries, cooler etc. before and after oil flushing is the responsibility of the contractor.

4.13.13
For full welding of structures, tanks and piping etc., only welding generators shall be used. The use of welding transformers will be subject to the approval of BHEL Engineer.

4.13.14
Erection and commissioning of connecting piping – permanent & temporary for oil purification equipments and all operations for cleaning, oil flushing, dismantling of temporary piping during pre and post-commissioning of equipment up to full load shall be the responsibility of contractor as part of scope of work.

4.14 ELECTRICAL AND INSTRUMENTATION

4.14.1
Contractor shall mount all flow indicators, centrifugal/speed switches of motors, accumulators, pressure regulators etc. which are received loose and which are to be erected/mounted at site on air lines, water lines, oil lines, HP & LP Bypass system, steam lines, auxiliaries and firemen floor and other operating floors on boiler/power house and other equipments. These are to be mounted during erection for finalising routing/position etc. They are to be dismantled after completion of erection work and handed over to BHEL for calibration. After calibration, these instruments shall be remounted by the contractor in their respective positions just before commissioning.

4.14.2
Certain instrumentation like, pressure gauges, power cylinders, flow meters, valve actuators, flow indicators, etc are received in assembled condition as integral part of equipments. Contractor shall dismantle such equipment at an appropriate stage under the instruction of BHEL and hand them over to BHEL for calibration and storage. Contractor shall re-erect them in position just before commissioning of the equipment.

4.14.3
Seal welding of Thermo-wells, RT plugs before Hydro test of equipments and piping systems is also within the scope of this work/specification. Contractor shall also remove the seal welded plugs by process of grinding and fix and seal weld Thermowells after Hydro test/steam blowing of lines.

4.14.4
Providing necessary engineer/supervisors/technicians/electricians as required by BHEL engineer for drying out the LT/HT motors is within the scope of the work. Job includes testing the motor for finding out PI & IR values and making necessary cabling connection for heating for dry out from the nearest source of supply and maintaining and controlling the temperature till the IR and PI values are achieved as per standards. However, BHEL will provide necessary motorised insulation testers for this purpose. The contractor shall provide necessary power cables and other tools and consumables for the above works free of charges. Before undertaking dry out/trial run of HT motors, the end shields and covers shall be opened on both the ends of the motor for inspection, cleaning and greasing of bearings.

4.14.5
Welding of all Thermo-wells, draft, pressure and temperature instrumentation points and all other instrumentation points on piping, and auxiliaries is within the scope of this work.

4.14.6
All the HT Motors shall be preserved with space heaters on and provided with proper cover till the commissioning of the motors.

4.14.7
Mounting of instrumentation on turbine, generator and exciter and auxiliaries which are the integral part and supplied with main equipments shall be the part of scope of work and contractor shall render necessary services for their commissioning.

4.15 GENERAL

4.15.1
During the course of erection, platforms and floor grills are to be cut at certain places to route steam, oil, water and air piping, cable trays, etc or for accommodating erection, rigging etc, the cutting of platforms and grills should be minimum and as approved by BHEL engineer. After completion of work, the platform/grills cut shall be made good neatly as instructed by BHEL engineer.

4.15.2
Welding/threading of GI instrument air / Service air piping as specified in drawing / documents and instruction of BHEL engineer shall be carried out as part of scope of work.

4.15.3
No temporary supports should be welded on to the piping.

4.15.4
Contractor shall carry out preservation painting on all items taken from stores. The preservation painting has to be carried out on material taken from stores and also on material erected wherever the shop painting has given away. Periodical inspection shall be made as per the instructions of BHEL engineer and the portion of items or the complete items needing painting shall be carried out to the satisfaction of BHEL engineer. The contractor shall provide this facility till the commissioning and handing over of the equipment to the customer. The contractor shall also carry out preservative and touch up painting on equipments covered under this specification stored at stores/storage yard.

4.15.5
Adjustment of spring hangers for piping shall be done by the contractor during initial erection. After initial commissioning trials, it is possible that the spring hangers have to be adjusted repeatedly till the correct spring compression is achieved. Contractor shall do the same to the satisfaction of BHEL engineer. The marking of cold and hot positions on the hangers shall be done by the contractor.

4.15.6
The contractor shall return to BHEL the excess materials left over after completion of work, materials issued for temporary pipelines for HT, chemical cleaning, flushing, blowing etc. and materials issued on returnable basis in neatly dressed condition. Necessary grinding, edge cutting (square facing), edge preparation (VEE), painting etc. to the condition similar to the one at the time of issue shall be in scope of work.

4.15.7
All suitable access/approach platforms for valves/ isolating/throttling devices/equipments at suitable location/elevations shall be carried by contractor as per instruction of BHEL Engineer as part of scope of work.

4.16 PG TEST TAPPING POINTS

Installation and welding of Tapping Points for taking performance test measurements shall be carried out by the contractor as part of this work for the equipments covered under this tender specification under the guidance of BHEL engineer. The scope will be limited to all the tapping points for which materials are available and their locations identified within the regular contract period and extensions thereof.

4.16.1
All packing and forwarding material shall be returned as soon as the material is unpacked. The location for storage of such materials shall be as indicated by BHEL Engineer.

4.16.2
All Measuring and Monitoring Devices (MMD) used for the work in scope of this tender specification shall be calibrated by the accredited agencies that are approved by BHEL or calibration tractability is established up to National Physical Laboratory.

4.16.3
Contractor shall furnish the consumption details of chemicals, lubricants, TIG welding filler wire, welding electrodes and other consumables on monthly basis.

4.17 SPECIFIC INCLUSIONS

4.17.1
All terminal connections for equipment & piping covered in this specification.

4.17.2
Impulse/pneumatic piping between customer's battery limit and equipments.

4.17.3
Servicing and assembly of control valves/regulating valves, fixing of filter elements/strainers & steam blowing & blanking devices in LP bypass, M.S. Strainer, HRH Strainer and blanking of LP bypass, ESV & IV System, for hydro test, steam blowing etc is the part of scope of work.

4.17.4
Erection, commissioning and testing of HP & LP Bypass system valves and Cold Re-heat Non-return valve with respective oil system and accessories are included under the scope of tender specification. Erection HP & LP Bypass valve and CRH NRV shall involve installation of valves on temporary supports to provide reference/connection of HP Bypass, LP Bypass and CRH Critical piping which will be erected by other agency, dismantle the valves/ remove valve internals & fix steam blowing devices (as advised by BHEL Engineer at site) to make Steam blowing connection and install the valves permanently/re-fix the internals on permanent supports for final connection. Oil system shall require erection of tanks, Motors, Power Cylinder, oil piping, oil flushing of system etc. till final commissioning and handing of system. All above are under the scope of contractor. BHEL shall provide oil for flushing and initial fill, topping up free of charges. Contractor shall collect the oil barrels from BHEL stores/storage yard and return the empty container/left over oil barrels (flushed oil / fresh oil) to BHEL stores after completion of work.

4.17.5
It may be specifically noted that it should not be construed or claimed by the contractor that with the technical specification and "exclusions and/or inclusions" detailed in this tender specification, BHEL has covered the entire scope of work and/or the details thereof to be executed by the contractor.

4.17.6
Complete control fluid systems of both HP and LP Bypass System are included in this specification. Associated assistance for commissioning like lube oil flushing, filling and topping up of lube oil etc shall be part of the work.

4.17.7
Assembly and Installation of Strainer Elements of MS and HRH system is within the scope of work. Cleaning of these strainer elements during trial operation of machine is also covered under this scope.

4.17.8
Erection and welding of Impulse piping from various equipments & pipings tapping point to root valve.

4.17.9
Chipping of foundation, placement, erection, alignment, commissioning, grouting, mounting of equipment mount instruments and other fittings of BHEL (PEM bought out items) supplied Packages like Misc. Crane & Hoists, Misc. Pumps, Plate Heat Exchangers DG set and other Tanks & Vessels etc. & other packages are in scope of the work. **Erection and commissioning of these Equipments/Pumps & Packages will be required to complete to meet the commissioning schedule/ milestone activities of other areas like Boiler, CW Systems, DM water treatment plant, Ash Handling Plant, Service water requirement, fuel oil handling plant etc. Contractor shall plan and complete erection & commissioning of these equipments on priority as per decision of BHEL Engineer/Customer requirement. Details of such systems are furnished in relevant Appendix.**

4.17.10

DIESEL GENERATING SET: 1 DG SET (750 KVA, 415 V) COMPRISING OF:

i) Diesel Generator set (750 KVA, 415 V) assembled & comprising of Radiator, Base Frame, Diesel Engine and Alternator etc of size 7500x2500x3400 mm having static wt.8800 Kg.

ii) Acoustic Enclosure (will be dispatched loose & to be assembled at site)-7100Kg.

iii) Fuel Tank (990 Litres capacity) and dimension 1250x750x1400 mm

iv) Exhaust Pipe Line:

(a) M.S. Pipe "B" Class, 8" -36 Mtrs.

(b) M.S. Short Bends-8"-8Nos.

(c) M.S. Flanges-"D: Table-8"-16 Nos.

(d) Fasteners-Lot.

(e) Flexible Bellows-2 Nos.

v) Fuel Pipe Line:

(a) M.S. Pipe "B" Class, 1" -18 Mtrs.

(b) M.S. Elbow Socketweld Type-1-10Nos.

(c) M.S. Flanges-1"-4 Nos.

(d) Fasteners-Lot.

vI) DG set control panel of size 1550x1000x2075mm

vii) Aux. Distribution Board of size 2800x550x2250mm

viii) Battery charger with 4 Batteries for DG set starting.

ix) Battery charger with 4 Batteries for DG set control panel supply.

x) Power Cable:

(a) 3.5 Corex400 Sq.mm armoured Aluminium cable-58 Meters

(b) Aluminium lugs 400 Sq.mm-24 Nos.

(c) Aluminium lugs 185 Sq.mm-8 Nos

(d) Single compression Glands 2.3/4"-8 Nos.

xi) Control Cable:

(a) 12Cx2.5 Sq.mm, Cu. Armoured multistrand cable-15 Meters

(b) 4Cx2.5 Sq.mm, Cu. Armoured multistrand cable-40 Meters

xii) Earthing Material:

(a) GI Plate-600x600x6mm-4Nos.

(b) GI Pipe-3/4" with Funnel-22mm-4Nos.

(c) GI Chamber Cover-12"x12"-4Nos.

(d) GI Strips-50x6mm-80 Meters

xiii) Hardware:

(a) M.S. Angle-65x65x6mm-60Meters.

(b) M.S. Angle-50x50x6mm-72Meters.

(c) M.S. Channel-100x50x50x6mm-60Meters.

(d) M.S. Plates-200x200x10mm-8Nos.

(e) M.S. Plates-300x300x16mm-4Nos.

(f) Support Plate-300x150x8mm-4 Nos.

(g) Support Plate-150x150x8mm-8 Nos.

(h) Anchor Fastener Bolts-10Dia.x30 mm-50 Nos.

(i) M.S. Flat-30x3mm-3 Meters.

(j) G.I. Cable Tray-300x50x2mm-14 Meters.

(k) G.I. Cable Tray-150x25x2mm-24 Meters

(l) Champion Gasket-3mm Th.-1 sheet.

(m) Special Tools-1 set

(n) Dial Gauge-1 No.

xiv) AVM PADS-"S" Series / Gerb make-12 Nos.

Contractor shall carry out the installation, erection, testing and commissioning works of DG set and acoustic enclosure along with related electrical & cabling works etc. as per relevant drawings, documents and instruction of BHEL engineer at site. The tentative weight of complete DG set and with associated items/ components/ accessories including electrical items like Batteries & Battery chargers, cables,

cable trays, earthing (grounding) materials, structural steel, foundation materials etc. is about 25MT.

4.17.11

Misc. cranes and hosts (EOT crane, Hoists, chain pulley blocks etc.) lifting equipments along with associated are under the scope of this tender specification. These equipments have to be installed at different locations and elevations. The scope of works in this regard shall include the following:-

Handling at stores & storage yard & taking over delivery from BHEL of components of the cranes & other lifting equipments and test load etc.

Transportation to site of work including via pre-assembly yard, if needed.

Pre-erection checks, pre-assembly if needed.

Erection, alignment, welding, bolting, fastening of all components of the cranes/lifting equipments including electric bus bards/trailing cables, pendants etc.

Dry run test at no load.

Load tests at different loads as advised by BHEL at site.

Over load test at designated load as required.

Return of surplus components, test loads etc to BHEL stores with due reconciliation.

Priority of erection & commissioning of these equipments shall be as per instruction and priority of BHEL at site and decision of BHEL site In-charge at site shall be final and binding on contractor.

4.17.12 WELD FIT-UP AND WELD JOINT PROTECTIVE PAINT, COMPONENT PRESERVATIVE PAINTING ETC.

1) All protective paints for the protection of weld joint fit-ups, application of primers on finished weld joints are in the scope of contractor.

2) Two coats of steam washable paints shall be applied on steam side of LP turbine and condenser components, as advised by BHEL. The steam washable paints, primer and thinner will be supplied by BHEL free. However, arrangements for surface preparation and paint application like sand/shot-blasting, consumables like surface cleaning agents, paint brush, brush cleanser, labour and necessary tools and plants are in the scope of contractor.

3) All site weld joints falling in steam side shall be painted with two coats of steam washable paint.

4) The water boxes shall be sandblasted to remove all traces of primer applied at the works. Thereafter two coats of Epoxide priming paint followed by two/three coats of high build black coal tar epoxy (e.g., "Apcodur CP684" of Asian Paints **or equivalent from any other BHEL/Customer approved manufacturer**). Contractor shall submit manufacturer's batch test certificate / test certificate from BHEL/MSEB approved laboratory for the primers and paints. Prior approval of BHEL for each and every batch of the primer & paints shall be mandatory. In order to achieve a desired minimum paint dry film thickness (DFT) as specified in BHEL drawing, number of coats may be applied and method of application shall be as recommended by the paint manufacturer. **Contractor shall arrange required paints & primers and other consumables for above works.**

5) All water side surfaces of water chambers including tube plate shall be thoroughly surface prepared and painted. Required primer & paints and other consumables for condenser water box and tube plates shall be provided by Contractor.

6) After the successful completion of hydraulic testing, the interior surfaces of the water boxes, main tube plates shall be painted with suitable anticorrosive paints as per special procedures laid down by BHEL. Required necessary paints along with primers and other consumables shall be arranged by Contractor.

7) Prior to hydraulic testing of water side of condenser, interior surfaces of water boxes shall be painted.

8) After completion of tubing and tube side hydro test, all water side surfaces of water chambers including tube plate shall be painted.

9) Preservation of all components/equipments during various stages of erection, commissioning till handing over is in the contractor's scope. All prescribed methods of surface cleaning prior to application of preservative paint shall be followed by the contractor. **Contractor has to arrange all primer and paints, and other consumables like wire brush, painting brush required for this work.**

10) Condenser internal components/parts/surfaces have to be surface protected with steam washable paint as per BHEL standards.

4.18 EXLUSIONS

The following are specific exclusions from the scope of work/specification: -

A) All cable connections except those specified as scope of work.

B) Measuring instruments, monitoring, relaying, protection and signalling equipments other than those supplied with the equipments by / on behalf of BHEL and which have been indicated as scope of work.

C) Erection, testing and commissioning of electrical panels and starting resistors for DC JOP, DC EOP pumps, Seal oil system

D) Electrical testing of motors. However erection these will be under the scope of this tender specification.

E) Impulse piping and fittings from the tapping points of various equipment root valves other than those specified as scope of work.

F) Copper tubing work.

G) Civil works to the extent not specifically provided for in this tender.

H) Thermal insulation of Turbine, ESV, IV, CRHNRV, HP & LP Bypass valves, integral piping and external piping/regenerating piping system.

I) Supply of materials for temporary piping (pipe, valve, structural steel etc.) required for hydraulic test, chemical cleaning, flushing or steam/air blowing of the pipelines.

J) Supply of chemicals and lube oil for pre-commissioning and commissioning activities.

K) Final painting.

SECTION-5

SPECIAL CONDITIONS OF CONTRACT

5.0 OBLIGATIONS OF THE CONTRACTOR (TOOLS, TACKLES, CONSUMABLES ETC.)

5.1 ACCOMMODATION, DRINKING WATER & LOCAL TRSNPORTATION FOR LABOUR / OTHER EMPLOYEES

BHEL/Client shall **not** provide any space / land for construction of labour colony. Contractor shall make his own arrangements for labour colony including arranging space, construction of Quarters, Lighting, water, sanitation etc. with hygiene and comply with all requirements.

5.2 TOOLS AND TACKLES, MEASURING AND MONITORING DEVICES:

5.2.1
The contractor shall provide all (in addition to those in BHEL scope) required tools and plants, monitoring and measuring devices (MMD) and handling & transportation of equipments for the scope of work covered under these specifications. Contractor shall deploy suitable Crane(s) for handling of materials issued to him at BHEL/client's stores/storage yard and erection of equipments.

5.2.2
Contractor has to provide spanners of all sizes, Bolt stretching devices etc. as required for satisfactorily carrying out the complete erection / commissioning works. No spanners will be provided by BHEL to the contractor.

5.2.3
Contractor has to arrange slings of all sizes for completing the works covered under these specifications except the special slings for Generator Stator Lifting/Handling, which will be provided by BHEL free of charges on returnable basis.

5.2.4
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. The indicative list of major T&P to be arranged by the contractor has been furnished in relevant appendix. Contractor shall also mobilize all other T&P as necessary for timely and satisfactory completion of the work in scope.

5.2.5
BHEL shall not provide any Chemical Cleaning /Flushing pumps / equipments as required for Chemical cleaning/flushing of piping and related equipments / systems. These Chemical pumps of suitable capacity along with motor starters, cables etc. shall have to be provided by the contractor as part of scope of work. Contractor shall arrange / provide all Chemical cleaning arrangements as per requirement and instructions of BHEL engineer without any delay/time lapse.

5.2.6

Strand and Jack/Lift & Shift arrangement for lifting and placement of Generator Stator:

Contractor shall arrange complete set up of Strand and Jacks/Lift & Shift arrangements and all Tools & Tackles as required for lifting and placement of Generator Stator to its designed elevation & foundation including the services of expert execution and supervision. BHEL/Client shall not provide any Crane / Lifting Arrangements for Generator Stator handling & erection. Method for Handling of Generator Stator and lifting & placement to required elevation and foundation is the scope of responsibility. Generator Stator shall have to be lifted & placed on designated foundation with Strand and Jacks/Lift & Shift method (refer clause 4.6).

Sleepers & Jack or Sand Bag & Jack or any methods/arrangement other than the one specified above for Lifting & Placement of Generator Stator will not be accepted.

5.2.7

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.

5.2.8

Complete set of hydraulic jacks of 50 tonnes and 100 tonnes capacity shall be arranged by the contractor for use during erection and commissioning of Turbine. Also, hydraulic jacks of 100 tonnes and 63 tonnes capacity along with long high pressure hoses of suitable length for Generator erection and alignment shall be arranged by the contractor. These jacks shall of internationally reputed make, highly reliable and maintained in excellent working condition. They shall be tested for safe working before deploying in actual work. These jacks shall not be permitted for use anywhere other than Steam Turbine / Generator area.

5.2.9

All jack bolts that are required during erection for carrying out roll-check etc. will have to be arranged by the contractor. No jack bolts will be provided by BHEL.

5.2.10

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 alternative arrangements expeditiously so that the progress of work is not hampered.

5.2.11

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 alternative arrangement at the risk and cost of the contractor.

5.2.12

The Tools & Tackles to be arranged by the contractor shall be in proper working condition and their operation shall not lead to unsafe condition. Contractor shall obtain prior approval of BHEL Engineer with regard to Brand, Quality and Specification for all the T&P before deploying in actual work. The movement of cranes, and other equipment should be such that no damage / breakage occurs to foundations, other equipments, material, property and men. All arrangements for the movement of the T&P etc shall be the contractor's responsibility. The necessary test certificates for Equipments to be submitted.

5.2.13
Normally, use of welding generators only is permitted for welding. The use of welding transformers will be subject to specific and prior approval of BHEL Engineer.

5.2.14
The contractor at his cost shall carry out periodical testing of his construction equipments and calibration of Measuring & Monitoring Devices (MMD). 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. All calibration shall be traceable to national or international standards.

5.3 CONSUMABLES

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

TG Special Consumables like Hylomar / Golden Hermetite / Stag-B / Molykote/ Anabond compounds / Rubber fixing compounds etc. will have to be arranged by the contractor.

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.

5.3.3 PRIMERS & PAINTS

All primers and paints is in the contractor's scope unless provided otherwise in BHEL scope as free issue.

5.3.4
Consumables for BHEL supplied equipments (Cranes, T&P etc.)

Refer relevant clause of SECTION –7 SPECIAL CONDITIONS OF CONTRACT in this regard.

5.4 WELDING ELECTRODES, TIG WELDING FILLER WIRES AND GASES

5.4.1
Contractor, at his cost shall arrange all the required welding electrodes including the filler wires/TIG wires etc. as required and 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 before the actual use of the welding consumables.

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.

5.4.2
Gases like Argon, Oxygen and Acetylene etc. that are required for erection related activities shall be arranged by the contractor at his cost.

5.4.3
Nitrogen gas, if required for preservation during chemical cleaning process of piping system, will be arranged by BHEL free of charges. Contractor shall arrange necessary connector, Nipple, Regulator, Header and piping for usage of such Gas from Cylinders.

5.5 FIELD OFFICE

5.5.1
The contractor shall make his own arrangements for field office and stores for accommodating necessary equipments, tools room for execution of the work. Only open space will be provided by BHEL / customer, free of charges as per the availability of space. Further, contractor shall obtain concerned local administrative authority's approval for construction of his filed office and pay the fees and chares as may be applicable.

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, BHEL will arrange to remove and expenditure thereof including overhead expenses (presently @30%) 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 AREA LIGHTING

5.6.1
Contractor shall arrange adequate floodlights, hand lamps and area lighting. Contractor shall use his own materials like cables, fuses, switchboards etc. BHEL/client will not provide anything in this regard.

5.7 CONSTRUCTION POWER & WATER

5.7.1
Construction power (three phase, 415v / 440v) will be provided at one point near the site approximately 500 Meters from erection site free of charge. However all taxes, duties, levies, charges etc, as applicable, shall also be borne by the contractor. Required Energy Meter, all cables, fuses, distribution boards, switches, switchboards, bus bars, earthing arrangements, protection devices e.g. ELCB, if any, and any other installation as specified by Statutory Authority, Client in this regard, for drawl and distribution of construction power shall be arranged by the contractor. Obtaining approvals, payment of necessary fees, duties etc towards the clearance of such installations, if any, prior to these 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. The installation and maintenance of this shall be done by licensed and experienced Electrician.

5.7.3
The contractor shall install necessary Capacitor Bank etc. with appropriate control mechanism to maintain the Power Factor as per the guidelines in vogue from time to time in this regard. Any levy imposed by the customer / authority for any deviation in power factor shall be passed on to the contractor.

5.7.4
Contractor shall be equipped with back-up power supply arrangement like DG set and diesel operated welding machine etc. to tackle situations arising due to failure of customer supplied power, so as to ensure continuity and completion of critical process that are underway at the time of power failure or important activities planned in immediate future.

5.7.5
Client will provide at one point each the Construction Water and Drinking water free of charges in project premise. Contractor shall make his own arrangement for further distributio n as may be required.

5.7.6
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. Contractor shall take suitable insurance policy for such accidental loss/ damages.

5.8 RESPONSIBILITIES WITH REGARD TO LABOUR EMPLOYMENT ETC.

Refer clause 2.8 of General Conditions of Contract in this regard.

5.8.1
Contractor shall also comply with the requirements of local authorities/ project authorities calling for police verification of antecedents of the workmen, staff etc.

5.8.2
BHEL / customer may insist for 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.

5.8.3
It is the responsibility of the contractor to arrange gate pass for all his employees, T&P etc for entering the project premises. 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 permits for working beyond normal working hours.

5.8.4
Contractor shall provide at different elevation suitable arrangement for urinal and drinking water facility with necessary plumbing & disposal arrangements including construction of septic tank. These installations shall be maintained in hygienic condition at all times.

5.8.5
If at any time during the execution of work, it is noticed that the work is suffering on account of non-availability/shortfall in provision of resources from the contractor's side BHEL will make suitable alternate arrangements at the risk and cost of contractor. The expenditure incurred with overheads thereby shall be recovered from the contractor.

5.9 TAXES, DUTIES, LEVIES

Refer to Clause 2.8.4 of General Conditions of Contract. Notwithstanding anything contained therein, the following provisions shall be applicable for this contract.

5.9.1
The contractor shall pay all (save the specific exclusions as enumerated in this contract) taxes, fees, license charges, deposits, duties, tools, royalty, commissions or other charges which may be levied on the input goods & services consumed and output services delivered in course 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.

However, provisions regarding Service Tax and Value Added Tax (VAT) on output services and goods shall be as per following clauses.

5.9.2 Service Tax & Cess on Service Tax
Service Tax and Cess on Service Tax as applicable on output Services are excluded from contractor's scope; therefore contractor's price/rates shall be **exclusive** of Service Tax and Cess on Output Services. In case, it becomes mandatory for the contractor under provisions of relevant act/law to collect the Service Tax & Cess from BHEL and deposit the same with the concerned tax authorities, such applicable 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 and Service Tax paid on Input Services that are used for providing the output services can be taken credit of against the Service Tax payable on output services. However BHEL may opt for availing the abatement provision in which case cenvat credit may not be available on input duty.

5.9.3 VAT/WCT
As regards Sales Tax on transfer of property in goods involved in Works Contract 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.

5.9.4 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.

5.9.5 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 SUBMISSION OF PERIODICAL REPORTS

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

1) Consumption of consumables like welding electrodes, gases and paints
2) Consumption of construction power
3) Availability and utilization of BHEL's Tools & Plants
4) Availability and utilization of contractor's Tools & Plants
5) Daily manpower reports
6) Daily progress reports of activities & incidents
7) Calibration reports
8) Records of wages payment
9) Any other report/record as may be specified by BHEL/client.

BHEL at site will suggest 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.

SECTION-6
SPECIAL CONDITIONS OF CONTRACT

6.0 CONTRACTOR'S OBLIGATION IN REGARD TO EMPLOYMENT OF SUPERVISORY ST AFF AND WORKMEN

6.1

The contractor shall deploy all the skilled/semiskilled/ unskilled labour including highly skilled workmen 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 relev ant Appendix. 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 or BHEL's client.

6.6

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.

6.7 SITE ORGANISATION

The contractor shall provide adequate staffing in the following areas in addition to the staffing requirements of execution as instructed/informed by BHEL:

- Overall Planning, Monitoring & Control
- Materials Management
- Condenser & Auxiliaries.
- Turbine & Auxiliaries.
- Generator & Auxiliaries.
- Pumps & Auxiliaries.
- Piping.
- Misc. Equipments
- Quality Control and Quality Assurance
- Safety, Fire & Security
- Industrial Relations and fulfillment of Labour Laws and other statutory obligations.

Contractor shall furnish an organisation chart indication the staffing pattern for the above functions. Contractor shall provide the names and details of Engineers/supervisor at the time of mobilisation to BHEL as per the proposed organisation chart.

SECTION-7

SPECIAL CONDITIONS OF CONTRACT

7.0 OBLIGATIONS OF BHEL

7.1 FACILITIES TO BE PROVIDED BY BHEL

7.1.1 Space for site office / stores

Refer section-5 in this regard.

7.1.2 Construction Power & Water

Refer Section-5 in this regard.

7.1.3 Other materials and consumables:

BHEL shall not provide any material / consumables except those specifically mentioned in this tender specification.

7.1.4 TEST MATERIALS (PLATES & PIPES)

BHEL will provide suitable plates and pipes free of cost only for site test of welders including IBR welders before their deployment. . Contractor shall prepare the required test pieces from such raw materials and shall arrange all destructive and non-destructive examinations of test blanks / pieces as scope of work. Responsibilities with regard to deployment of IBR welders and meeting the stipulations shall be the responsibility of contractor.

7.2 FILLER WIRE FOR TIG WELDING

BHEL will not provide any filler wire/TIG wires etc. and all these shall be arranged by contractor at his cost.

7.3 EQUIPMENTS – TOOLS & PLANTS

BHEL will make available only those T&P that are listed in relevant **Appendix** free of charge. All other required T&P shall be arranged by the contractor.

7.3.1 CRANES TO BE PROVIDED BY BHEL

BHEL shall not provide any Cranes other than Customer's EOT crane in TG Hall.

Contractor shall be responsible for complete operation of EOT crane along with providing the operator, day-to-day operation/maintenance, general cleanliness and holding/supporting the supply cables etc. provided by the contractor as per requirement.

EOT crane will be used on sharing basis by other agencies working within the TG hall under the instruction of BHEL. Contractor has to plan his activities well in advance and inform BHEL engineer in charge/ Construction Manager the date of actual use.

7.4 OTHER T&P

7.4.1

The responsibilities of contractor defined above for BHEL cranes shall also be applicable, mutates-mutandis, in respect of other tool & plants provided by BHEL.

7.4.2

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

7.4.3

BHEL engineer will inspect all the tools and plants issued to contractor periodically. In case contractor fails to make good, the damages caused, BHEL will do the same at contractor's cost. The tools and tackles will be issued only to persons nominated by the contractor.

7.4.4

Required temporary structural steel, pipes & fittings, valves for conducting hydraulic test, chemical cleaning / steam blowing / oil flushing / acid cleaning etc shall be provided by BHEL on returnable basis.

7.5 CHEMICALS, GASES AND LUBRICANTS FOR PRE-COMMISSIONING AND COMMISSIONING

7.5.1

All lubricants/Lube oil and chemicals required for testing, chemical cleaning, acid cleaning, oil/chemical/gas flushing required for testing, pre-commissioning & commissioning up to trial operation of equipments/unit will be provided by BHEL free of cost. Flushed/fresh oil for flushing of lube oil/governing/control oil system and filling with day-to-day topping up, Carbon-dioxide & Hydrogen gas for purging and filling in Turbo-generator will also be supplied by BHEL free of cost. Contractor shall arrange for taking delivery and loading of all such consumables from BHEL/Customer Stores, transportation to site of work and unloading thereon, filling in the system and return the used lube oil, balance quantity of consumables, empty containers etc to BHEL stores duly reconciled for quantity.

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 provisions and as per BHEL Engineer's instructions.

8.2

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

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

8.3

A daily log book should be maintained by every supervisor/engineer of contractor on the job in duplicate (one for BHEL and one for contractor) for detailing and incorporating alignment/ clearance / centring / levelling readings and inspection details of various equipments etc.

8.4

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

High pressure welding details like serial number of weld joints, welders name, date of welding, details of repair, heat treatment etc. will be documented in welding log as per BHEL Engineer's instructions.

Record of radiography containing details like serial number of weld joints, date of radiography, repairs, if any, re-shots etc. shall also be maintained as per BHEL engineer's instructions.

Record of heat treatments performed shall be maintained as prescribed by BHEL. Similarly, performance report of all welders shall be furnished for scrutiny of BHEL Engineer.

8.5

All the welders including HP welders shall carry identity cards as per the proforma prescribed by BHEL. Only welders duly authorised by BHEL/Boiler inspector / customer /consultant shall be engaged on the work.

8.6

Contractor shall provide all the measuring and monitoring devices (MMD) required for completion of work satisfactorily. These MMD shall conform to requirement in respect of measurement range, accuracy level and any other stan dard specification.

8.7

The MMD deployed by the contractor shall, at all stages of works, have valid and current calibration certificate. The calibration of these MMD shall be got done from the agencies accredited/approved by BHEL/Client. Copy calibration certificate in respect of these MMD 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 for the continuity of usage, as per BHEL specifications. Contractor shall conform to the specification of BHEL regarding storage of these MMD.

Contractor shall record the identification number of the MMD used for measurement of parameters in the relevant FQP Log Sheet/joint measurement record. In case the contractor is found to be using / has used any MMD that does/did not have appropriate and valid calibration, a penalty of Rs. 2,000/- for every such incidence will be imposed by BHEL. This will be in addition to the consequential expenses to be borne by the contractor on account of re-work/ rectification of the affected work.

8.8

Re-work necessitated on account of usage of invalid MMD 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 the loss of time.

8.9

In the course of erection, it may become necessary to carry repeated checks of the work with instruments recently calibrated, re-calibrated. Such instruments whenever necessary will be provided by BHEL, on returnable basis, on specific authorisation by BHEL Engineer.

8.10

Vibration indicators/vibration recorders/vibration analysers will be provided by BHEL for checking and analysing vibration levels of rotating equipments with necessary operators. Contractor shall provide necessary labour for carrying out such tests.

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 unit/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 free of cost.

8.12.2

Any modifications suggested by BHEL FES and QA Engineers team shall be carried out. Claims of contractor, if any, shall be dealt as per Section-13, provided such modifications have not arisen for reasons attributable to the contractor.

8.13 STATUTORY INSPECTION

8.13.1

The scope includes getting the approvals from the statutory authorities (like Boiler Inspector, Factory Inspector, Electrical Inspector, P.F. Commissioner, Labour Commissioner and any other Authority connected to this project work). This includes arranging for inspection visits of these Statutorily Authority periodically as per BHEL Engineer's instructions, arranging materials for ground inspection, taking rub outs for pressure parts /IBR material parts to be offered for inspection, submitting co-related inspection reports, documents, radiographs and installation of electrical equipments etc. and following up the matter with them. Contractor shall also make all arrangements for offering the products/systems for inspection at location, as applicable to the concerned Authority.

8.13.2

The contractor shall pay all fees connected with testing his welders / men / workers and testing, inspection, calibrating of his MMD instrument and T&P equipments.

8.13.3

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

8.13.4

Refer clause No.2.8.5 General Conditions Of Contract for BHEL's responsibility with regard to payment of Inspection fee of Boiler Inspectorate.

8.13.5

Contractor should be qualified to execute pressure parts & piping work coming under the purview of IBR, for which he should register himself with CIB of state concerned. Contractor should be aware of the latest IBR regulations and Electricity act, including the amendments thereof.

8.14

The quality management system of BHEL, Power Sector – Western Region (PSWR) has already been certified and accredited with ISO 9001:9002 standards in this regard. The basic philosophy of the Quality Management System is to define the organisational 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, and maintain the relative 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 it is desirable that they themselves are accredited under any Quality Management system Standard.

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.

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

9.1 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:

i) Name of Contractor
ii) Name of Contractor Site-in-charge & Telephone number
iii) Job Description in short
iv) Date of start of job
v) Date of expected completion
vi) 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.

9.2 SPECIAL CONDITIONS

9.2.1 Safety

9.2.1.1 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.

9.2.1.2
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.

9.2.1.3
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 PPE of standard ISI make as may be prescribed

9.2.1.4
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.

9.2.1.5
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.

9.2.1.6
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.

9.2.1.7
The contractor shall adopt all fire safety measures as per relevant Indian Standards

9.2.1.8
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.

9.2.1.9
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.

9.2.1.10
Temporary arrangements made at Site for lifting, platforms, approach access etc should be properly designed and approved before being put to use.

9.2.1.11
All excavations and openings must be securely and adequately fenced/barricaded and warning signs erected when considered necessary as per relevant code of practice.

9.2.1.12
No persons shall remove guardrails, covers or protective devices unless authorized by a responsible supervisor and alternative precautions have been taken

9.2.1.13
Access ways, means of escape and fire exits shall be clearly marked, kept clear and unobstructed at all times

9.2.1.14
Only authorized persons holding relevant license will drive and operate site plant and equipments e.g. cranes, dumpers, excavators, transport vehicles etc

9.2.1.15
Only authorized personnel are allowed to repair, commission electrical equipments.

9.2.1.16
Gas Cylinders shall be handled and stored as per Gas Cylinders Rules and relevant safe working practices

9.2.1.17
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.

9.2.1.18
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.

9.2.1.19
The contractor shall train adequate number of workers/supervisors for administering “FIRST AID”. List of competent first aid administers should be prominently displayed.

9.2.1.20
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

9.2.1.21
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.

9.2.1.22
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.

9.2.1.23
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.

9.2.1.24
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.

9.2.1.25
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.

9.2.1.26 **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 neighbouring
- 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.

9.2.2 OCCUPATIONAL HEALTH

9.2.2.1
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.

9.2.2.2
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

9.2.2.3
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

9.2.2.4
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 PPE 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

9.2.2.5
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

9.2.2.6
Contractor workers engaged in dust environment shall be issued with necessary dust protection aids and the use of the same shall be enforced

9.2.2.7
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

9.2.2.8
Adequate arrangements shall be made to provide safe drinking water

9.2.2.9
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

9.2.3.0 HYGIENE and HOUSEKEEPING

9.2.3.1
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.

9.2.3.2
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.

9.2.3.3
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

9.2.4 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 advice.

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**

9.3.1

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

9.5.0 **REPORTING**

9.5.1
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.

9.5.2
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.

9.5.3
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.

9.5.4
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.

9.5.5
In addition, contractor shall submit periodic reports on safety to the authorised BHEL official from time to time as prescribed.

9.5.6
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.

9.6 **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 and 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

SN	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/tackles	To check for defects and efficacy of brakes	User Third party	Daily Every Year
5	PPE	To check for defects	User	Daily

9.7 **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	Instance of Violation	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/-

Sl. No	Instance of Violation	Fine (in Rs.)
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.

9.8

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

9.9 Memorandum of Understanding

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

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 contractors.

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:

9.10

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 1287	1986		ELECTRIC TOASTER
IS 13063	1991		STRUCTURAL SAFETY OF BUILDINGS 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 No.	YEAR	Amd upto	DESCRIPTION
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 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 No.	YEAR	Amd upto	DESCRIPTION
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 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 RPEWAYS 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 tenderers, 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 contract 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, OVERRUN, CONTRACT VARIATION, ADVANCE PAYMENT 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 **two weeks** 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:

ACTIVITY	TENTATIVE SCHEDULE OF COMPLETION
Turbine Box up	6th month
Completion of Oil Flushing completion	9th month
Barring Gear	10th month
Rolling & Synchronisation	10 ½ th month
Completion of Trial Operation	11 ½ th month
Completion of commercial operation	12th month
Completion of all facilities and PG test related works.	13th month

 # - Indicates the No. of months from the start of contract period.

11.1.2

In order to meet above schedule and other intermediate targets/activities as set by BHEL Engineer In charge at site, to meet customer requirements/project schedule, contractor shall arrange all necessary resources and work force in consultation with BHEL engineer at site to undertake works simultaneously in all possible work fronts as made available to contractor.

11.1.3

Contractor shall specifically note that there is likely to be some delay in supplies of materials / release of work fronts / other reasons. Contractor shall have to work round the clock on such critical activities as a part of catch up programme to meet the project requirement to the extent possible and shall also provide required resources as part of scope of work.

11.1.4 Start of Contract Period and Duration

The total contract period for completion of entire work shall be **13 (Thirteen) months** from the start of erection. Erection of the first major equipment, as identified by BHEL site-in-charge, on its permanent location/ foundation shall be reckoned as the start of contract period. Small components like packer plates, insert plates, etc. will not be considered for this purpose.

However the contractor shall have to mobilize his resources earlier than the start of contract period for preparatory work like taking over and chipping of foundations, blue matching and grouting of packer plates etc.

The contractor shall complete all the work in the scope of this contract within the contract period.

11.1.4 Grace Period

Grace period of **3 (Three) months** beyond the contract period may be provided for this contract. However, Contractor shall strive to achieve all milestone events as per actual requirement of project schedule without taking recourse to the Grace Period.

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-a-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 cause leading to extension of the contract period is not due to any reasons attributable to the contractor is on him (the contractor). Review of the performance as stated vide Clause 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:

11.2.2.1

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

B) Erection / Commissioning programme not achieved owing to non-availability of materials.

11.2.2.2 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.

11.2.2.3 Erection / Commissioning programme not achieved due to any other reasons not attributable to the contractor.

11.3 Contract Extension

11.3.1

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.

11.3.2

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 11.2.2 shall be done during the extended period. The overrun 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 here not made by him.

11.3.3

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 Overrun Compensation

If the contract is extended beyond the contract (including 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. 50,000/-** (Rupees fifty 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.

11.5 Price Variation

Agreed price/rate shall remain firm through out the contract period including grace period and extended period thereof. No price variation/adjustment shall be applicable for this contract and clause No.2.15 of General Conditions of Contract shall not be applicable.

11.6 Contract Variations

11.6.1 Variation in Weight/Quantity

Weights of various equipments/systems and/or quantities of various items of work indicated under this Tender Specification are tentative and are likely to vary while executing the actual work. In case of such variations, the following shall be applicable.

The lump sum rate accepted for **Item SN 01 of Rate Schedule** shall remain unchanged and be applicable irrespective of any variation.

For any upward or downward variation in the quantities of **Item SN 02.A, 02.B and 03 of Rate Schedule**, the rates accepted shall remain applicable without any variation; payments will be made for the actually executed quantity of respective item.

In case a new item of work (not indicated in the Tender Specification) becomes necessary for completion of the work, it shall be carried out by the contractor. For the purpose of payment, item rate shall be adopted/deduced from comparable rate of similar item already existing in the present contract if any; else it will be mutually discussed and agreed upon.

11.7 Interest Bearing Recoverable 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).

11.8 Definition of Work Completion

The contractor's scope of work under these specifications will deem to have been 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

12.0.1
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.

12.0.2
Clause 2.6 of general conditions of contract shall be referred to as regards mode of payment, and measurement of the work completed.

12.0.3
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 on account of workmanship guarantee of work executed. The same will be released after completion of the guarantee period of 12 months from the date of completion of entire work as certified by BHEL.
However, this amount may be released earlier (including before completion of work) subject to receipt and acceptance of bank guarantee of equal amount in BHEL's prescribed format and the BG shall be kept valid till completion of such guarantee period and an additional six months claim period. This is also subject to the condition that the contractor has started the work and also furnished/remitted the initial Security Deposit as per contract.

12.0.4
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.

12.0.5
BHEL will release payment through Electronic Fund Transfer (EFT)/RTGS. In order to implement this system, the following details are to be furnished by the Contractor pertaining to his Bank Accounts where proceeds will be transferred through BHEL's banker:

1. Name of the Company
2. Name of Bank
3. Name of Bank Branch
4. City/Place
5. Account Number
6. Account type
7. IFSC code of the Bank Branch
8. MICR Code of the Bank Branch

BHEL may also choose to release payment by other alternative modes as suitable.

12.1 STAGES OF PROGRESSIVE PRO-RATA PAYMENTS

The progressive payment for erection, testing and commissioning on accepted price of contract value/item rates will be released as per the break up given hereinafter under the clause 12.1.1)

12.1.1
TG with TG Auxiliaries and associated equipments, Integral piping, pumps with aux. tanks, vessels, DG sets etc. (scope as per **"AA**"), External piping/Re-generative piping with associated

valves, components/items, fitting, supports etc. (scope as per "**BB**") and Equipments/systems, Central Lube Oil System, Misc. pumps, Condenser On Load Tube Cleaning System (COLTS), Debris Filters, Plate Heat Exchangers, Misc. Cranes & Hoists, HP & LP Dosing system etc. (scope as per **"CC**") - {SL.No. (A) above}

(A) FOR Sl. No. 01 OF RATE SCHEDULE: – TG with TG Aux. and associated Equipments, Integral Piping, Pumps with Aux., Tanks, Vessels, DG Set .

SN	Description	%
1.0	CONDENSER (16%)	
1.1	Preparation of foundation.	1.0
1.2	Placement, alignment, assembly and welding of bottom plate segments, hot well, NDT and spring elements placement	1.0
1.3	Assembly and positioning of water chamber, water boxes, side plates, bottom plates, welding and NDT	1.5
1.4	Assembly, alignment and welding & NDT of tube support plates and internals like baffle plates, air evacuation pipes etc.	3.0
1.5	Assembly, welding & NDT of dome walls and dome stiffeners, extraction piping and steam throw device etc.	2.5
1.6	Insertion, expansion, end milling of condenser tubes	4.0
1.7	Hydro test of steam and water side	1.0
1.8	Welding of condenser neck joint and NDT& completion of balance works	1.0
1.9	Assy. and Erection of Condenser R.E. Joints and Butterfly Valves	1.0
	Total of 1.0	**16%**
2.0	TURBINE (18 %)	
2.1	Placement, alignment and grouting of base plates of LPC and bearing pedestals	1.5
2.2	Placement and alignment of LP outer casing bottom portion and centre guide keys	1.0
2.3	Placement of LP rotor and alignment with inner casing and checking of blade clearance	1.0
2.4	Assembly, alignment & welding of LP Outer Casing upper half.	1.5
2.5	Placement of IP Turbine, lowering of IP Rotor on bearings and checking of clearances, coupling etc.	1.5
2.6	Placement of HP Turbine, lowering of HP Rotor on bearings and checking of clearances, coupling etc.	1.5

SN	Description	%
2.7	Boxing up of LP inner-inner & inner- outer and roll check	1.0
2.9	Alignment of all Rotors including reaming, honing and fixing of coupling bolts	1.5
2.10	Assembly of regulation system	1.0
2.11	Installation of ESV, IV, HP & LPBP Valves, CRH NRV, MS Strainers (internals), HRH strainers (internals)	2.0
2.12	Erection, alignment and welding of cross around piping	1.5
2.13	Final box-up of LP turbine	1.0
2.14	Completion of Turbo-visory works	1.0
2.15	Final boxing up of Pedestals after Oil Flushing completion	1.0
	Total of 2.0	**18%**
3.0	TURBO GENERATOR (28%)	
3.1	Preparation of foundation, levelling, matching and grouting of foundation plates	1.0
3.2	Unloading of stator from Trailer and shifting to point of Lifting	1.0
3.3	Readiness of Generator Stator lifting arrangement at site	5.0
3.4	Lifting of Generator Stator to required elevation	5.0
3.5	Placement, Levelling and Centring of Generator Stator on foundation	5.0
3.6	Testing of Hydrogen Coolers and insertion	1.0
3.7	Rotor Insertion and lowering on bearings.	1.0
3.8	Erection of Brushless Exciter with accessories and covers etc.	1.0
3.9	Checking the run out, alignment of Generator Rotor, LP Turbine Rotor, Brushless Exciter rotor and grouting of foundation frames/plates.	2.5
3.10	Reaming, Honing of coupling holes and fixing of coupling bolts of LP-Gen. and Generator Brushless Exciter Rotors.	1.5
3.11	Boxing up of Generator and assembly of Hydrogen Seals	1.0
3.12	Final gas tightness test of Stator with complete system	2.0
3.13	Completion of balance works.	1.0
	Total of 3.0	**28%**

SN	Description	%
4.0	**PUMPS AND AUXILIARIES (22 %)**	
4.1	**Erection/Testing of Boiler Feed Pumps.** **Erection / Testing of Motor Driven BFP- 3Nos.** (A) Foundation chipping, blue matching of foundation and levelling, centring of grillage/foundation frame and bolt grouting. (B) Placement of feed pump, booster pump, motor, hydraulic coupling and preliminary alignment. (C) Grouting of grillage/ foundation and final alignment of BFP, BP, Motor and HC (D) Erection of lube Oil piping, working oil coolers & other balance piping like mechanical seal water coolers with piping etc, Erection of panel/racks and oil flushing of oil piping.	5.0
4.2	Erection & Testing of Condensate Extraction Pumps- 3 sets	3.0
4.4	Erection and Testing of Lube oil pumps, oil centrifuge, Main oil tank, Coolers, Duplex Filter and other related equipments / Items including with fittings etc.	2.0
4.5	Erection and testing of Vacuum Pumps	1.0
4.6	Erection and Testing of Seal oil, Gas System units/Refrigeration Driers / racks / equipments, Brushless Exciter air system.	1.5
4.7	Erection of HP & LP heaters with standpipes and fittings.	2.0
4.8	Erection of Gland Steam Condenser, Drain cooler with fittings.	0.5
4.9	Erection of De-aerator, Feed Storage Tank and associated approach platform with ladders etc.	2.0
4.10	Erection of Tanks & Vessels like HP & LP Flash Tanks, Unit Flash Tank/Vessel with fittings.	1.0
4.11	Erection of DMCW Tank, Portable Water Tank, Clean oil Tank, Dirty Oil Tank and Oil unloading Tank with fittings.	2.0
4.12	Erection and commissioning of DG set with associated accessories with fittings including electrical items, exhaust stack and acoustic treatment etc.	1.0
4.13	Erection of Misc. / other Auxiliaries	1.0
	Total of 4.0	**22%**
5.0	**INTEGRAL PIPING (10 %)**	
5.1	Lube. Oil and Jacking Oil Piping	2.0

5.2	Control oil / Governing oil Piping for ESV's, IV's, CRHNRV's and LP Bypass Governing oil system etc.	1.0
5.3	HP Bypass valves oil system with aux., Nitrogen filling system, Piping and fittings (as per PGMAs 22-100, 22-101, 22-600, 22-601, 22-701, 22-889, 22-988 etc.)	1.0
5.4	Seal Steam Piping	1.0
5.5	Turbine Drainage Piping	1.0
5.6	Condensate Spray Piping	1.5
5.7	Generator Seal Oil Piping	1.0
5.8	Generator Gas Piping	1.0
5.9	Miscellaneous and Other Piping	0.5
	Total of 5.0	**10%**
6.0	**ASSISTANCE FOR COMMISSIONING (6%)**	
6.1	Oil Flushing of lube. Oil, Jacking oil system, seal oil and Governing oil system	1.0
6.2	Commissioning of BFPs and CEPs	1.0
6.3	Barring Gear operation	1.0
6.4	TG system Vacuum pulling operation	1.0
6.5	Synchronisation	1.0
6.6	Completion of Trial Operation and related works of PG test	1.0
	Total of 6.0	**6%**

(B) FOR Sl. No. 02 (A&B) OF RATE SCHEDULE: External/Re-generating piping (Carbon Steel & Alloy Steel and Stainless steel) with valves, supports and fittings (Excluding TG Integral Piping).

Sl.No	Part of Activity Completed	Percentage Of Accepted Item Rates (C.S. & A.S. and S.S.)
A	Transport to work site & Erection / Placement in position	35%
B	Alignment, Fit-up & Welding	40%
C	NDT	5%

Sl.No	Part of Activity Completed	Percentage Of Accepted Item Rates (C.S. & A.S. and S.S.)
D	Post weld Heat Treatment	5%
E	Hydraulic Test of Pipeline	5%
F	Chemical Cleaning of Pipeline	2%
G	Steam Blowing of pipeline	3%
H	Synchronization	2%
I	Trial Operation Completion	2%
J	Completion of work related to PG Test and handing over.	1%
	Total	**100%**

(C) FOR Sl. No. 03 OF RATE SCHEDULE:- Equipments/Systems, Central Lube Oil system, Misc. Pumps, COLTS, Debris Filters, Plate Heat Exchangers, Misc. Cranes & Hoists, Self Cleaning Strainers, HP & LP Dosing System etc.:

1. 30 % on Placement and assembly of equipments on foundation/location.
2. 25 % on Levelling & Alignment and completion of welding etc. of equipments.
3. 15 % on assembly/erection of fine fittings.
4. 10% on completion grouting of foundation frame and securing/supporting of structure.
5. 10 % on commissioning / Charging of system.
6. 5 % completion of trial run operation.
7. 5% on completion of Load test and works related to PG test & handing over.

PAYMENT FOR WORK COMPLETED

12.2.1

The contractor should submit his on account bills with all the details required by BHEL on 26th of every month covering progress of work in all respects and areas up to 24th day of the same month.

12.2.2

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.

12.2.3

On receipt of the bill, joint measurement and checking of the work done will be carried out by the concerned BHEL engineer as per clause 2.6 of General Conditions of the Contract and break-up given vide clause 12.0. It shall be final and binding on the contractor.

12.2.4

The payment for running bills will normally be released in 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.

SECTION-13

SPECIAL CONDITIONS OF CONTRACT

13.1
If extra works (requiring up to 100 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, 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 tenderers are requested to take this aspect into account and the quoted rate should include all such contingencies.

13.2
However, BHEL may consider for payment as extra on man-day basis, for such of those activities detailed in clause 13.1 which require more than 100 man-hours and such payment will be regulated by the terms, conditions and stipulations contained in the clauses contained hereinafter. 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.

13.3
Extra works should be done by a separately identifiable gang, without affecting routine activities. Daily log sheets in the proforma 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 man-hour log sheets. It may, however, be noted that signing of log sheets by BHEL engineer does not mean the acceptance of such works as payable extra works.

13.4
Such extra works arising out of transit, storage and erection damages, payment, if found due, will be regulated as per section-14.

13.5
BHEL retains the right to award or not to award any of the major repair / rework / modification / rectification / fabrication works as defined above to the contractor, at their discretion without assigning any reason for the same.

13.6
It shall be noted that all extra works that arise on account of the contractor's fault, 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.

13.7
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 for 8 working hours, including overtime if any, other site expenses and incidentals, including supervision, consumables, tools and tackles, Plant & Machinery, Construction Equipment etc. will be **Rs. 320/-** (Rupees three hundred twenty only).

No payment will be made if an item of work lasts less than 100 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.

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.

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 **wilful** 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/Client has obtained project insurance policy and CPM Policy

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

15.1 EARNEST MONEY DEPOSIT:

Earnest Money Deposit for this tender will be Rs. 2,00,000/- (Rupees two lacs only).

One time EMD will also be Rs. 2 lacs.

EMD shall be deposited in cash (as permissible under income tax act), pay order or demand draft (payable at Nagpur in favour of 'Bharat Heavy Electricals Limited') only. **No other form of EMD remittance shall be acceptable to BHEL.**

EMD by the tenderer will be forfeited as per tender documents if

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

ii) The tenderer 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.

EMD shall not carry any interest.

15.1.3 In the case of unsuccessful bidders, the Earnest Money will be refunded to them after acceptance of tender by successful bidder.

15.2 Security Deposit

15.2.1 Security Deposit should be remitted by the successful tenderer. 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 shall be remitted <u>before start of the work</u> by the contractor in the manner specified as follows.

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 50% has to be remitted either by cash or in the other form 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 tenderer, excepting One Time EMD, shall be converted and adjusted against the security deposit or specific request by the contractor.

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.

APPENDIX – I

LIST OF TENTATIVE EQUIPMENTS / COMPONENTS TO BE ERECTED AND COMMISSIONED BY THE CONTRACTOR

(AA) TG WITH TG AUXILIARIES AND ASSOCIATED EQUIPMENTS, INTEGRAL PIPING, PUMPS WITH AUX. TANKS, VESSELS, DG SETS ETC:

A) STEAM TURBINE

1. Steam Turbine consists of 3 cylinders (HP/IP/LP) including the following :
   a. Sole / Base Plates & Foundation Holding Bolts.
   b. Bearing Pedestals.
   c. ESV & CV, IV & CV, LPBP Valves with EHA & Suspensions, LP BP water injection valves, HP & LP Bypass valves with Oil System equipments and oil piping.
   d. Steam Strainer Housing & Strainer Elements for Main Steam & Re-heat Steam Lines.
   e. Hydraulic Turning Gear.
   f. Electro – Hydraulic Governing System backed up with Hydro mechanical system.
   g. Governing Racks, LP By pass racks and solenoid & Test valve racks.
   h. Cross around Piping between IP & LP casing.
   i. Blanking Device / Fixtures for ESV, IV, LPBP, CRH NRV etc., for hydraulic testing and steam blowing.
   j. Extraction Steam pipeline from LP turbine to condenser dome wall.
2. Lube Oil system, Jacking oil system, Control oil / Governing oil system , LP Bypass Governing oil system consists of piping, Oil tanks, injector assy., Oil Centrifuge, AOP, JOP and EOP with starter panels, Leak & Dirty Oil Tank with pumps, Duplex filter and oil vapour fans and other auxiliaries.

B) TURBO-GENERATOR :

1. Hydrogen cooled main Generator consists of the following.
   a. Stator
   b. Rotor wit rotor insertion device.
   c. Dry air blower system
   d. End Shields & Bearing
   e. Brush Gear
   f. Generator Covers
   g. Generator accessories
   h. Seal Oil System with Seal Oil Unit - I & II and other associated items.
   i. H_2 cooling system with Hydrogen distributor and other associated items.
   j. H_2 /CO_2/N_2 Gas system
   k. Other Accessories.

APPENDIX – I

LIST OF TENTATIVE EQUIPMENTS / COMPONENTS TO BE ERECTED AND COMMISSIONED BY THE CONTRACTOR

C) HEAT EXCHANGERS.

1. Condenser, mainly comprising of the following parts.
   - b. Bottom Plate
   - c. Turbine end & Generator end Side Plates.
   - d. Dome walls
   - e. Front & Rear water chambers with tube plates
   - f. Support plates.
   - g. Hot Well
   - h. Spring Elements and supports
   - i. Steam Throw Device
   - j. Air Extraction Pipe and Baffle.
   - k. Stiffening Pipes, Rods & Slabs
   - l. Instruments & Fittings, loose parts etc.
   - m. Condenser tubes (Stainless Steel)
   - n. Condenser R.E. Joints (Inlet & Outlet -each 2 sets)
   - o. Condenser Butterfly Valves-(Electrical Operated, Inlet & Outlet, each 2Sets & each valve of Dia. 1800mm)

D. PUMPS WITH AUXILIARIES, TANKS, VESSELS, DG SETS ETC.

1. Gland Steam Condenser with attachments, fan exhausters & fittings.
2. LP Heaters 1, 2 & 3 with attachments and fittings
3. HP Heater 5 & 6 with attachments and fittings.
4. Drain Cooler with fittings.
5. De-aerator & Feed Storage Tanks (in Three Sections) with attachments, fittings and platform.
8. Turbine Oil Coolers
9. Seal Oil Coolers.
10. Hydrogen Coolers.
11. Exciter Air Coolers

12. Boiler Feed Pumps – Three sets : Each Comprises of:

- a. Boiler feed pump with tubing.
- b. Booster pump with base plates & tubing.
- c. Hydraulic coupling.
- d. BFP Motor.
- e. BFP Base plate.
- f. Hydraulic coupling stool.

APPENDIX – I

LIST OF TENTATIVE EQUIPMENTS / COMPONENTS TO BE ERECTED AND COMMISSIONED BY THE CONTRACTOR

g. Lube oil cooler for Hydraulic Coupling.

h. Working oil cooler for H.C.

i. Hydraulic coupling pipes & Accessories.

j. Re-circulation valves.

k. Suction Strainers for BFP.

l. Local gauge racks for BFP.

m. Lube Oil Cooling system, Seal water cooling system and other accessories for pumps.

n. Suction Strainer for Booster Pumps

13. Condensate Extraction Pumps- Three sets :Each comprises of

a) Condensate Extraction Pump assembly.

b) Foundation frame.

c) Canister.

d) Basket type suction strainer.

e) Local gauge rack.

f) CEP Motor.

14. Tanks &Vessels:

Sl.NO	DESCRIPTION	PACKAGE SIZE in (mm)	WT.IN KG
1.	HP Drain Flash Tank 1 No.	2650x3000x3950.	5000
2.	LP Drain Flash Tank - 1 No.	1950x2200x2550	3000
3.	Unit Flash Tank – 1 No.	1250x1350x2300	1000
4.	DM CW Tank (10 CU M)-1 No.	Dia.2500x7000H	6,000
5.	Portable Water Tank (5 CU M)-1 No.	2000x2000x2000	3,000
6.	Clean Oil Tank (60 CU M)-1 No.	5000x4500x3000	10,500
7.	Dirty Oil Tank (60 CU M)-1 No.	5000x4500x3000	10,500
8.	Oil unloading Tank (1 CU M)-1 No.	1500x2500x500	600
		Total Weight	**39,600**

APPENDIX – I

LIST OF TENTATIVE EQUIPMENTS / COMPONENTS TO BE ERECTED AND COMMISSIONED BY THE CONTRACTOR

15. DIESEL GENERATING SET: 1 DG SET (Capacity 750 KVA & & 415 V) COMPRISING OF:

i) Diesel Generator set (750 KVA, 415 V) assembled & comprising of Radiator, Base Frame, Diesel Engine and Alternator etc of size 7500x2500x3400 mm having static wt.8800 Kg.

ii) Acoustic Enclosure (will be dispatched loose & to be assembled at site)- 7100Kg.

iii) Fuel Tank (990 Litres capacity) and dimension 1250x750x1400 mm

iv) Exhaust Pipe Line:

(a) M.S. Pipe "B" Class, 8" -36 Mtrs.

(b) M.S. Short Bends-8"-8Nos.

(c) M.S. Flanges-"D: Table-8"-16 Nos.

(d) Fasteners-Lot.

(e) Flexible Bellows-2 Nos.

v) Fuel Pipe Line:

(a) M.S. Pipe "B" Class, 1" -18 m.

(b) M.S. Elbow Socket weld Type-1-10Nos.

(c) M.S. Flanges - 1"-4 Nos.

(d) Fasteners-Lot.

vi) DG set control panel of size 1550x1000x2075mm

vii) Aux. Distribution Board of size 2800x550x2250mm

viii) Battery charger with 4 Batteries for DG set starting.

ix) Battery charger with 4 Batteries for DG set control panel supply.

x) Power Cable:

(e) 3.5 Corex400 Sq.mm armoured Aluminium cable-58 Meters

(f) Aluminium lugs 400 Sq.mm-24 Nos.

(g) Aluminium lugs 185 Sq.mm-8 Nos

(h) Single compression Glands 2.3/4"-8 Nos.

xi) Control Cable:

(c) 12Cx2.5 Sq.mm, Cu. Armoured multistrand cable-15 Meters

(d) 4Cx2.5 Sq.mm, Cu. Armoured multistrand cable-40 Meters

xii) Earthing Material:

(e) GI Plate-600x600x6mm-4Nos.

(f) GI Pipe-3/4" with Funnel-22mm-4Nos.

(g) GI Chamber Cover-12"x12"-4Nos.

(h) GI Strips-50x6mm-80 Meters

xiii) Hardware:

(o) M.S. Angle-65x65x6mm-60Meters.

(p) M.S. Angle-50x50x6mm-72Meters.

(q) M.S. Channel-100x50x50x6mm-60Meters.

(r) M.S. Plates-200x200x10mm-8Nos.

(s) M.S. Plates-300x300x16mm-4Nos.

(t) Support Plate-300x150x8mm-4 Nos.

(u) Support Plate-150x150x8mm-8 Nos.

(v) Anchor Fastener Bolts-10Dia.x30 mm-50 Nos.

(w) M.S. Flat-30x3mm-3 Meters.

(x) G.I. Cable Tray-300x50x2mm-14 Meters.

(y) G.I. Cable Tray-150x25x2mm-24 Meters

(z) Champion Gasket-3mm Th.-1 sheet.

(aa) Special Tools-1 set

(bb) Dial Gauge-1 No.

xiv) AVM PADS-"S" Series / Gerb make-12 Nos.

Contractor shall carry out the installation, erection, testing and commissioning works of DG set and acoustic enclosure along with related electrical & cabling works etc. as per relevant drawings, documents and instruction of BHEL engineer at site. The tentative weight of complete DG set and with associated items/ components/ accessories including electrical items like Batteries & Battery chargers, cables, cable trays, Earting materials, structural steel, foundation materials etc. is about 25MT.

16. BOUGHT OUT ITEMS (BHEL HARDWAR Scope)

1. Turbine Integral Piping (along with Hangers & Supports, Valves, Drain Valves and fittings, As Part of TG INTEGRAL PIPING) Consisting of:

a. Lube Oil Piping.
a. LP Governing Oil system (EHI) with piping.
b. Seal Oil Piping.
c. Gland Seal Piping
d. Equipment Drains & Vent
e. Cross Around Piping.
f. Gas & Air System Piping.
g. Condensate Spray Piping
h. Turbine Water Drainage Piping
i. Other Misc. system Piping etc.,

APPENDIX – I

LIST OF TENTATIVE EQUIPMENTS / COMPONENTS TO BE ERECTED AND COMMISSIONED BY THE CONTRACTOR

2.Other equipments / items As Part of Main TG, TG Integral and PUMPS WITH AUXILIARIES, TANKS, VESSELS, DG SET ETC.) Consisting of:

a. Condenser Air Evacuation Vacuum Pumps-2 sets

b. H2 Cylinders-120 Nos.

c. Co2 Cylinders –63 Nos.

d. N2 Cylinders-5 Nos.

e. Vapour Exhausters-2 sets

f. Motorised temperature Control Valve with actuator – 1 set.

g. Refrigeration Gas Drier - 2 sets.

h. Lifting Beam and slings for Generator Stator – 1 set

j. Welded Titanium Grade 2, Condenser Tubes (Being arranged by customer and further works included under this tender specification. – lot

k. Air Exhauster with motor for GSC Air Exhauster – 2 sets

l. Lifting Beam – 1 set

m. Priming Pump Packages-2 Sets

n. Jacking oil pump with Motor- 2 sets (1 set DC & 1 set AC)

o. Aux. oil pump & Emergency oil Pumps with Motor- 3 sets (2sets AC & 1 Set DC).

p. Duplex filers for Lube oil & Jacking oil pump with Motor – 1set for each.

q. Butter fly valves – 1 lot.

r. Three way temperature Control valves – 1 set.

s. Double three way valve –1 set.

t. NRV with Al. flap – 2 sets.

u. Pressure limit valve – 1 set.

v. Oil purification unit (Oil centrifuge) - 2 sets

w. Oil Vapour Exhauster – 2 sets.

x. Lead Diaphragm – 2 set.

y. Spay Nozzles – lot.

z. Dirt Catcher – 1 set.

aa. Dampers – lot.

bb. Variable Load Spring Cages – lot.

cc. Flexible Bends – lot.

dd. Vacuum Breaker Valve Assy. Along with solenoid valve- 1 set.

ee. Turbine oil & Control fluid - lot

ff. Dry Air preservation system.—1 set

gg. Flow Nozzle for PG Test – lot

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LIST OF TENTATIVE EQUIPMENTS / COMPONENTS TO BE ERECTED AND COMMISSIONED BY THE CONTRACTOR

hh. Through Port Gate Valves-lot

ii. Spring Loaded NRV'- lot

iii. Angle drain valves

kk. LP Bypass Stop & Control valve with EHA and Water injection valve. LP Governing oil system is High Pressure Governing oil system – 1 set.

ll. Gear Pump (Lube oil Re-circulation) – 1 set.

mm. Hydraulic Accumulators with filling & Gauge device- 1 set.

nn. Seal Steam & Leakage Steam Control Valve with Actuator- 1 set.

oo. Seal Oil Vapour Exhauster.

pp. TG Integral Piping with Hangers & Supports and drain valves

qq. HP & LP Dosing System

3. List of TG Integral piping Schemes applicable:

(A) TG Integral Piping:

Seal Steam piping.

Condensate Spray piping.

Lube oil piping (Lube oil, Jacking oil etc).

Control/ Governing oil piping.

LP Bypass Valve (high pressure) Governing System

Turbine drainage piping

Cooling water piping.

Seal oil system piping.

Generator Gas system piping.

LP turbine extractions to condenser.

1. (B) HP Bypass valve with complete oil system with stainless Steel Control oil Piping and Skid etc. Supplied from BHEL Trichy (under PG-22).

1. (C) LP Bypass valve with complete High Pressure Control oil system with Stainless Steel control oil Piping, Skid etc. supplied from BHEL Hardwar vendor.

(BB) EXTERNAL PIPING/RE-GENERATIVE PIPING WITH ASSOCIATED VALVES, COMPONENTS/ ITEMS, FITTING, SUPPORTS ETC.:

1. External /Regenerative System Piping:

a) LPBP valve upstream & Downstream (PGMA-80-312)

b) HPBP calve to CRH piping (PGMA-80-321)

c) Extraction Steam to LP Heater-1 (PGMA-80-330)

d) Extraction Steam to LP Heater-2 (PGMA-80-331)

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LIST OF TENTATIVE EQUIPMENTS / COMPONENTS TO BE ERECTED AND COMMISSIONED BY THE CONTRACTOR

e) Extraction Steam to LP Heater-3 (PGMA-80-332)

g) Extraction Steam to Deaerating Heater (PGMA-80-335)

h) Extraction Steam to HP Heater-1 (PGMA-80-336)

i) Extraction Steam to HP Heater-2 (PGMA-80-337)

Aux. Steam Header SV Exhaust (PGMA-80-373)

Unlisted SV Exhausts –TG Scope (PGMA 80-375)

HP Heater Vents – TG Scope (PGMA 80-381)

LP Heater Vents (PGMA 80-382)

Vent from Unlisted PPG/Equipment to Condenser (PGMA 80-385)

Condensate Pump vents (PGMA 80-387)

Condensate Air Evacuation Piping (PGMA 80-388)

Turbine Washing Steam (PGMA 80-398)

Condensate Suction (PGMA 80-400)

CD from Pump to LPH-1/DC inlet TEE & Recir. (PGMA 80-401)

CD from LPH-1/DC inlet TEE to TG TP (PGMA 80-402)

Condensate For sealing of Vacuum (PGMA 80- 407)

Condensate Dump from Header (PGMS 80-408)

Condensate / Make up to Condenser (PGMA 80-411).

Unlisted Condensate (PGMA 80-413)

Condenser Drain (PGMA 80-440)

Gland Steam Cooler Drains (PGMA 80-442)

LP Heater-1 to Condenser (PGMA 80-443)

LP Heater-2/3/4/5 Drains & Drip Pump Incl. (PGMA 80-444)

HP Heater Drains (PGMA 80-447)

TG Cycle piping Drains & Vents (PGMA 80-449)

Main Circulation Water System (PGMA 80-468)

Demineralised Water System (PGMA 80-473)

Service Water Piping (PGMA 80-477)

Drinking Water Piping (PGMA 80-478)

Lube oil piping system (PGMA 80-673)

H& S for Light up Steam lines (PGMA 80-921, as applicable)

H & S for Light up – Non Steam lines (PGMA 80-922, as applicable)

H & S for Steam Blowing (PGMA 80-923, as applicable)

H & S for Synchronisation- Steam Lines (PGMA 80-924)

H & S for Steam Blowing –Non Steam lines (PGMA 80-925)

APPENDIX – I

LIST OF TENTATIVE EQUIPMENTS / COMPONENTS TO BE ERECTED AND COMMISSIONED BY THE CONTRACTOR

H & S for LP Piping (PGMA 80-933)

Test Thermowells (PGMA 81-415)

Performance Guarantee Test materials (PGMA 81-416)

Other valves /NRVs & QCNRVs as supplied for TG equipments and applicable scope of piping under this tender specification

Steam Traps

Air Traps

Flow elements/Flow nozzles.

ME Bellows

Aux. PRDS

(CC) EQUIPMENTS/SYSTEMS, CENTRAL LUBE OIL SYSTEM, MISC. PUMPS, COLTS, DEBRIS FILTERS, PLATE HEAT EXCHANGERS, MISC. CRANES & HOISTS, SELF CLEANING STRAINERS, HP & LP DOSING SYSTEM ETC. (SUPPLIED FROM PEM/ BHOPAL AND RELATED VENDORS):

SN	DESCRIPTION	PACKAGE SIZE (mm)	Approx. WT. (KG/ITEM)
1.	**Central Lube Oil System:**		
1.1	Clean oil Pump with Drive motor, Duplex Type Strainer, Pressure Gauge& DP Gauge etc.-1 Set		450
1.2	Dirty oil pump with Drive motor, Duplex Type Strainer, Pressure Gauge& DP Gauge etc.-1 Set		450
1.3	Drain oil return pump with Drive motor, Duplex Type Strainer, Pr. Gauge& DP Gauge etc.-1 Set		450
2.	**MISC. CRANES & HOISTS**		
2.1	**Under Sling EOT Cranes.**		
2.1.1	Single Girder under Sling EOT crane for Air Compressor Building -1 No.	Capacity 8 MT, Span -9 M, Height of lift -6 M, Bay length -35 M	5,000
2.2	**Chain Pulley Blocks:**		
2.2.1	Chain Pulley Block for Elevator Machine Room in TG hall -1 No.	Capacity 3 MT, Lift-10 M and travel 5 M.	600
2.2.2	Chain Pulley Block for ACW Pumps Area in TG Hall – 1 No.	Capacity 3 MT, Lift-8.5 M and travel 22M.	600

APPENDIX – I

LIST OF TENTATIVE EQUIPMENTS / COMPONENTS TO BE ERECTED AND COMMISSIONED BY THE CONTRACTOR

SN	DESCRIPTION	PACKAGE SIZE (mm)	Approx. WT. (KG/ITEM)
2.2.3	Chain Pulley Block for DMCW Pumps Area in TG Hall – 1 No.	Capacity 3 MT, Lift-8.5 M and travel 22M.	600
2.2.4	Chain Pulley Block for DMCW SG Booster Pumps Area – 1 No.	Capacity 3 MT, Lift-8.5 M and travel 11M.	600
2.2.5	Chain Pulley Block for Vacuum Pumps in TG hall Area – 2 No.	Capacity 3 MT, Lift-8.5M and travel 10M.	2x600
2.2.6	Chain Pulley Block in A/C Plant Room area – 1 No.	Capacity 2 MT, Lift-5 M and travel 12 M	500
2.2.7	Chain Pulley Block (without travelling trolley) for Air Washer Room- 2 Nos.	Capacity 2 MT, Lift-5 M	2x500
2.2.8	Structural materials for fixing of above Misc. cranes and hoists.	Structural materials comprising of ISMB-250, Square 50x50 bar, Rails etc.	5,000
3.	**Plate Heat Exchangers** with associated components/ items, attachment, fittings etc.- 3 **sets.**	Each of size- H-2776XL - 3950XW -1370 mm and weight-8000 kg	3x8,000
4.	Debris filters with associated components/items, attachment, fittings etc. **– 2Sets**	Each weighing about 8500Kg.	2x8,500
5.	Self Cleaning Strainers- 2Sets	Each weighing about 1750 Kg.	2x1,750
6.	Condenser On Load Tube Cleaning System **(COLTS)-** 2Sets (each set weighing about-8050 Kg.	Each set comprising of: (i) Ball Injection Pipes-8 Nos.-30 Kg. (j) Ball re-circulating skid - 1320Kg. (k) Ball Separator-/Ball collector strainer-6200Kg. (l) D.P. Measuring system -500 Kg.	2x8,050

APPENDIX – I

LIST OF TENTATIVE EQUIPMENTS / COMPONENTS TO BE ERECTED AND COMMISSIONED BY THE CONTRACTOR

SN	DESCRIPTION	PACKAGE SIZE (mm)	Approx. WT. (KG/ITEM)
7.	**Misc. Pumps**		
7.1	**Sump Pumps:**		
7.1.1	Sump Pumps (permanent installed non clog Submersible Motor Type in TG hall)-2 sets, (each pump of capacity 30 Cu. M/hr & Head 20MWC to handle sea water)	Each set comprising of accessories like: (m) 25 Meter long Hose pipe (ii) 25 Meter long Power Cable (iii) Lifting Chain (iv) Pump Strainer (v) Wall mount control Panel etc.	2x1,500
7.1.2	Sump Pumps (Portable non clog Submersible installed Motor type for D row & E row of TG Building)-1 set (Capacity 40 Cu. M/hr & Head 20MWC to handle sea water)	Set comprising of accessories like: (n) 25 Meter long Hose pipe (ii) 25 Meter long Power Cable (iii) Lifting Chain (iv) Pump Strainer (v) Trolley mount control Panel etc.	1x1,500
7.1.3	Sump Pumps (Portable non clog Submersible installed Motor Type for General purpose)-3 sets (each of capacity 40 Cu. M/hr & Head 20MWC to handle sea water)	Each Set comprising of accessories like: (o) 25 Meter long Hose pipe (ii) 25 Meter long Power Cable (iii) Lifting Chain (iv) Pump Strainer (v) Trolley mount control Panel etc.	3x1,500
7.1.4	Sump Pumps (for fly ash Silo are applied by Ash Handling Plant package vendor of BHEL)- 2 sets (each of		2x4,000

APPENDIX – I

LIST OF TENTATIVE EQUIPMENTS / COMPONENTS TO BE ERECTED AND COMMISSIONED BY THE CONTRACTOR

SN	DESCRIPTION	PACKAGE SIZE (mm)	Approx. WT. (KG/ITEM)
	capacity 30 Cu. M/hr & Head 20MWC to handle sea water)		
7.2	ACW Pumps (Horizontal)- 3 Sets in TG hall (Each of capacity 1225 Cu. M/Hr., Head 50 MWC to handle Sea Water	Each of size -H-1500XL-3560XW-1200 mm and weight-3000 kg	3x5,000
7.3	DMCW Pumps (Horizontal)- 3 Sets (Each of capacity 975 Cu. M/Hr., Head 60 MWC to Passivated DM Water	Each of size -H-2000XL-4560XW-1500 mm and weight-4500 kg	3x4,000
7.4	DM CW Booster Pumps (Horizontal)- 2 Sets (Each of capacity 450 Cu. M/Hr., Head 50 MWC to Passivated DM Water	Each of size -H-1000XL-1985XW-900 mm and weight-1200 kg	2x3,000
7.5	Service Water (Horizontal)- 1 Set (Each of capacity 150 Cu. M/Hr., Head 60 MWC to clarified Water	Each of size -H-1000XL-1985XW-900 mm and weight-1200 kg	1x1,500
7.6	Hot Well Make up Pumps (Horizontal)- 2 Sets (Each of capacity 70 Cu. M/Hr., Head 60 MWC to handle DM Water		2x1,000
7.7	Cond. Trf. Pumps (Horizontal) - 2 Sets (Each of capacity 70 Cu. M/Hr., Head 60 MWC to handle DM Water	Each of size -H-1200XL-1700XW-650 mm and weight-1000 kg	2x1,000
7.8	Boiler Fill Pumps (Horizontal)- 1 Set (Capacity 130 Cu. M/Hr., Head 60 MWC to handle DM Water	Each of size -H-1100XL-2500XW-700 mm and weight-1500 kg	1x2,000
8.	LP Chemical Dosing System		
8.1	Hydrazine Dosing system-1 No.	2500x5250x3000	5,000
8.2	Ammonia Dosing Sysetm-1 No.	2500x5250x3000	5,000
8.3	NaOH Dosing System	2000x2000x2000	2,500
9.	HP Chemical Dosing System		
9.1	Phosphate Dosing system	2000x2000x2000	7,000
		TOTAL WEIGHT (SAY 154 MT)	154,050

NOTE :

2. The information furnished in this section is only a description regarding the item to be erected by the contractor. BHEL reserves the right of adding or excluding any

APPENDIX – I

LIST OF TENTATIVE EQUIPMENTS / COMPONENTS TO BE ERECTED AND COMMISSIONED BY THE CONTRACTOR

components / items / system according to the site requirements / customer requirements to complete various system in all respects.

3. Any other systems / components, quantities which are the integral to equipment supplied by the manufacturing unit also to be erected and commissioned by the contractor within the quoted / accepted rate / lump sum value.

3. The dimensions, weight, quantity for "(CC) Equipments/systems, Central lube oil system, Misc. pumps, COLTS, Debris filters, Plate Heat Exchangers, Misc. Cranes & Hoists, Self cleaning strainers, HP & LP dosing system etc. (supplied from PEM/Bhopal and related vendors)" are tentative and contractor shall erect and commission as per supply at site. The payment will be made as per accepted item rate for actual weight erected and commissioned.

APPENDIX – II

LIST OF PACKAGES, ODC DETAILS, WEIGHTS ETC.

(AA) FOR TG WITH TG AUXILIARIES AND ASSOCIATED EQUIPMENTS, INTEGRAL PIPING, PUMPS WITH AUX. TANKS, VESSELS, DG SET ETC.:

SN	DESCRIPTION	PACKAGE SIZE IN MM	GROSS WT. IN KG.
A.	**STEAM TURBINE:**		
1.	HP TURBINE	5060x3100x2900	56100
2.	HP INLET ASSY.	450X450X200	45
3.	HP EXHAUST ASSY.	1625X1335X675	1378
4.	HPT RELATED PARTS	1000X1000X500	190
5.	FRONT BEARING PEDESTAL	2950X2600X1600	12280
6.	PARTS OF FRONT BEARING	1800X1700X1000	600
7.	PARTS OF FRONT BEARING PEDESTAL	SUITABLE PACKAGE	115
8.	VALVE SUPPORT FOR HP OVERHAUL	1000X1000X400	800
9.	COMPENENTS OF ASSY. FIXTURE FOR HPT	3800X2500X1200	6864
10.	COMPENENTS OF ASSY. FIXTURE FOR HPT	3800X2100X900	1800
11.	COMPENENTS OF ASSY. FIXTURE FOR HPT	3300X2100X1210	3352
12.	COMPENENTS OF ASSY. FIXTURE FOR HPT	5010X4000X120	3356
13.	EMERGENCY GOVERNOR	400X400X500	76
14.	HYDRAULIC TURNING GEAR	1400X1400X1200	1000
15.	STEAM BLOWING & TEST DEVICE	2900X2100X1140	3160
16.	GLAND STEAM VALVE WITH ACT.	1750X1400X850	500
17.	ESV & CV CASING WITH VALVES	2850X2600X1900	2X8515
18.	ESV SERVO MOTOR WITH L.S.V MTG.	2100X1350X1250	2X1662
19.	LIMIT SWITCH MTG. TEST VALVES	2100X1350X1250	2X1900
20.	CONTROL VALVES SERVO MOTORS	2000X1500X1500	2X1900
21.	IP TURBINE	5750x3800x4070	58175
22.	I.P. TURBINE PARTS	700X700X500	285
23.	I.P. INLET PIPE ASSY	3700X2200X1900	7088
24.	HP-IP BEARING PEDESTAL ASSY.	4080X2005X2126	13275
25.	HP-IP BEARING PEDESTAL PARTS	1000X600X600	438
26.	HP-IP BEARING PEDESTAL PARTS	500X200X150	37
27.	AUX. OF IP TURBINE	1050X480X550	390
28.	AUX. OF IP TURBINE	1100X500X650	2X204
29.	SUSPENSION OF VALVE (IV)	3500X1500X700	2X2700
30.	ASSY DEVICE FOR VALVES	920X1000X450	213
31.	I.P. CONTROL VALVE SERVOMOTORS	2000X1300X1350	2X1880
32.	IV & CV CASING WITH VALVES	3790x3450x2565	2X18696
33.	FRAME FOR SUSPENSION (IV)	SUITABLE PACKAGE	2X765
34.	LOOSE ITEMS OF FRAME FOR SUSPENSION	600X450X250	300
35.	SOLE PLATE PEDESTAL ANCHOR	3400X1200X800	2510
36.	BASE PLATE ASSEMBLY	4500X1400X1200	4500
37.	BASE PLATE ASSEMBLY	2300X1250X600	2560
38.	BASE PLATE LP CASING	2300X2075X981	2680
39.	LP ROTOR	7210x3300x3350	62049
40.	LP OUTER CASING PARTS	7060X1480X2760	2X8085
41.	LPC OUTER CASING PARTS	4570X3230X980	2X2500
42.	COMPONENTS OF LP CASING UPPER PART	3500X300X300	495
43.	LP OUTER CASING PATRS	3450 X 1000X1100	900

APPENDIX – II

LIST OF PACKAGES, ODC DETAILS, WEIGHTS ETC.

SN	DESCRIPTION	PACKAGE SIZE IN MM	GROSS WT. IN KG.
44.	ASSEMBLY DEVICES	900X700X550	180
45.	AUX. OF LP TURBINE	3000X1300X1000	2100
46.	AUX. OF LP TURBINE	2000X1000X1825	2X1142
47.	LP JOINT COVERING	2300X1800X940	1235
48.	ASSY. TOOLS	1900X1000X890	500
49.	CAP (SPRING SUPPORT)	825X500X400	2X400
50.	CAP (COMPEN.ASSY)	3240X1740X1340	3400
51.	CAP (COMPEN.ASSY)	3240X1740X1340	2X3512
52.	CAP (OBLIQUE REDUCER ASSY)	1400X1400X1200	800
53.	CAP (MAN-HOLE ASSY)	1500X1600X1100	2X750
54.	CAP (MITRE BEND ASSY)	1550X1550X1300	4X670
55.	CAP (PIPE ASSY)	2000X1100X1200	645
56.	LONGITUDINAL GIRDER (LEFT & RIGHT)	6800X1820X1570	2X15182
57.	LP FRONT WALL (TS & GS)	6820X3750X910	2X10053
58.	LP SHAFT SEALING FRONT (FRONT & REAR)	1800X1700X740	2X2260
59.	LP SHAFT SEAL COMPENSATOR ASSY	1440X1420X520	2X1456
60.	LP CASING ASSY (FATRENERS)	1800X1700X740	2653
61.	LP CASING ASSY (PARTS)	3760X2060X860	4900
62.	LP CASING ASSY (PARTS)	450X450X250	140
63.	EXTRACTION PIPE LINE (LPC)	2600X1100X700	2X607
64.	EXTRACTION PIPE LINE (LPC)	1400X1300X700	2X326
65.	EXTRACTION PIPE LINE (LPC)	1650X800X450	470
66.	EXTRACTION PIPE LINE (LPC)	2700X1200X750	575
67.	EXTRACTION PIPE LINE (LPC)	1100X850X850	307
68.	EXTRACTION PIPE LINE (LPC)	2700X1750X1100	689
69.	EXTRACTION PIPE LINE (LPC)	1550X1450X900	530
70.	EXTRACTION PIPE LINE (LPC)	2000X600X600	366
71.	L.P. EXTRACTION PIPE LINE SHEATHING	2600X2000X1400	1330
72.	INNER GUIDE PLATE OF DIFFUSER (TS & GS)	2600X2400X1000	2X2118
73.	DIFFUSER (TS & GS)	4880X1730X2340	2X3275
74.	LP- GEN. PEDESTAL ASSY	3220X2285X2075	10200
75.	IP- LP PEDESTAL ASSY	3700X1860X2100	14600
76.	LP INNER OUTER CASING (U/H)	6720X3150X2325	21750
77.	LP INNER OUTER CASING (L/H)	6750X3500X2325	30907
78.	LP INNER CASING ASSY (FASTENERS)	1800X1700X740	1760
79.	LP INNER-INNER CASING (U/H) PARTIAL	4000X1570X2000	11722
80.	STEAM INLET PIPE (LPT)	2700X1300X900	840
81.	BEARING PEDESTAL PARTS	1000X700X700	1085
82.	STUD HEATING DEVICE & BREACH NUT HEATING DEVICE	1500X1200X250	315
83.	CRH NRV WITH SERVOMOTOR	3100X3040X2410	5860
84.	STEAM BLOWING DEVICE CRH NRV	2000X1000X500	973
85.	GOVERNING CONTROL RACK ASSY	4700X1900X3300	4510
86.	LP BYPASS VALVES	-------	2X4000
87.	LPBYPASS VALVE OIL SUPPLY UNIT (SKID)	----------	1000
88.	OIL FLUSHING & PRESSURE TEST DEVICE	750X400X550	130
89.	MAIN OIL TANK & NOZZLE ARGMNT.ASSY.	6180x 3260 x 2650	9981

APPENDIX – II

LIST OF PACKAGES, ODC DETAILS, WEIGHTS ETC.

SN	DESCRIPTION	PACKAGE SIZE IN MM	GROSS WT. IN KG.
90.	MAIN OIL TANK & NOZZLE ARGMNT.ASSY.	4200 x 1200 x 900	402
91.	INJECTION FOR SUCTION PIPE NB350	3300X1750X1210	1029
92.	INJECTION FOR SUCTION PIPE NB400	3500X750X750	922
93.	OIL STRIPPER	600X600X850	133
94.	OIL STRINERS	2050X800X1410	468
95.	VARIABLE ORIFICES THROTTLE VALVE	1000X500X250	115
96.	LEAKAGE OIL TANK	1000X1000X3000	515
97.	WASTE OIL TANK	1000X1000X3000	515
98.	OIL STRAINERS	2050X1200X1410	568
99.	CHANGE OVER VALVE	500X400X200	49
100.	ATT. SOLENOID VALVES	600X300X300	90
101.	TURBINE INTRUMENT RACKS	2750X1000X800	858
102.	TURBINE INTRUMENT RACKS	2300X750X750	765
103.	HOUSING FOR MS STRINER	1700X1025X900	3000
104.	HOUSING FOR MS STRINER	1725X1250X730	3000
105.	STEAM STRINER ASSY DEVICE	SUITABLE PACKAGE	652
106.	HOUSING FOR HRH STEM STRINERS	2200X1450X1100	2X3500
107.	MAIN STEAM STRAINER	1100X700X350	2X374
108.	HRH STRAINER	1600X1450X750	2X485
109.	STEAM STRAINER HOUSING GASKET	700X700X300	50
110.	BLANKING ARRANGEMENT FOR M.S.	------	907
111.	BLANKING ARRANGEMENT FOR H.R.H.	------	2038
112.	COMPENSATOR	600X600X900	50
113.	TOOLS AND PACKING DEVICES	1750X1200X980	684
		Total	**599,948**
B:	**GENERATOR :**		
1.	FOUNDATION ITEMS OF GEN.	3550X715X880	4656
2.	FOUNDATION ITEMS OF GEN.	2240X940X1220	2880
3.	GENERATOR STATOR	7520x4200x4770	218000
4.	GENERATOR ROTOR	10550x1560x1660	47742
5.	END SHIELD LOWER HALF (TE)	3640X1140X2000	6020
6.	END SHIELD LOWER HALF (EE)	3640X1140X2000	6020
7.	END SHIELD UPPER HALF (EE)	3640X1140X2000	5620
8.	END SHIELD UPPER HALF (TE)	3640X1140X2000	5620
9.	H.V. BUSHING	2000x950x600	590
10.	LOOSE ITEMS OF WOUND STATOR	1500X1200X1000	1010
11.	GENERATOR ACCESSORIES	2140X1240X1040	1546
12.	GENERATOR ACCESSORIES	3500X1800X1250	4075
13.	GAS BAFFLE RING, INSERT COVER	3700X3500X1340	4364
14.	BEARING SHELLS	1100X835X950	953
15.	SEAL RINGS	600x600 x200	73
16.	DEVICE FOR ROTOR INSERTION	2240X940X1220	1036
17.	ERECTION DEVICES	2550X1180X1140	997
18.	ERTECTION ROPES	1800X1450X200	201
19.	DRY AIR BLOWER	1350X1250X800	190
20.	TERMINAL CONNECTORS	1840X660X400	506
21.	BRUSHLESS EXCITER SET	5670X2390X2810	22386

APPENDIX – II

LIST OF PACKAGES, ODC DETAILS, WEIGHTS ETC.

SN	DESCRIPTION	PACKAGE SIZE IN MM	GROSS WT. IN KG.
22.	EXCITER FRONT COVER	4310X2950X2950	4122
23.	RR WHEEL COVER & SEALING WALL DE.	1800X1600X1600	970
24.	EXCITER REAR COVER	4330X3050X2950	3909
25.	EXCITER BED PLATE ACCESSORIES	5500X1050X800	3212
26.	EXCITER ACCESSORIES	2000X500X500	350
27.	COOLER RACK ASSEMBLY	3000X1800X1100	801
28.	SEAL OIL STORAGE TANK	3500X1300X1280	1460
29.	H2 DISTRIBUTER	3480X1540X440	333
30.	CO2 DISTRIBUTER	2770X1240X440	247
31.	SEAL OIL UNIT -I	3550X2900X3700	9160
32.	SEAL OIL UNIT -II	3610X2040X1850	3263
33.	GAS UNIT	2550X1790X2560	1150
34.	LIQUID DETECTOR RACK	1700X900X1800	450
35.	LOOSE VALVES	2000X1000X1000	959
36.	LOOSE INSTRUMENTS	1000X1000X500	80
37.	CO2 VAPURISER	1520X640X840	225
38.	GEN. PIPING	6500 X1200 X1000	6374
39.	GEN. PIPING	6500X700X700	1926
40.	GEN. PIPING	1900X1500X600	1615
41.	CONSUMABLES FOR FOUNDATION ITEMS	500X500X200	15
42.	CONSUMABLES	500X600X300	45
		Total	**375,151**
C.	**HEAT EXCHANGERS** **I) CONDENSER**		
1.	CONDENSER HOTWELL	11200x 1900x1200	6913
3.	BOTTOM PLATE	7150x3450x625	2x6793
4.	BOTTOM PLATE	7150x3850x625	8296
5.	BOTTOM PLATE	1900x700x300	271
6.	CONDENSER SUPPRT	1750X1000X1250	4X3650
7.	CONDENSER SUPPRT	1600X950X950	4775
8.	WATER CHAMBER (LHS)	5224X3610X360	2X6150
9.	WATER CHAMBER (RHS)	5224X3610X360	2X6150
10.	FRONT WATER BOX (G.S. & T.S.)	5950X3610X2485	2X15867
11.	REAR WATER BOX (GEN. SIDE & TUR. SIDE)	4760X3610X2025	2X9576
12.	SIDE WALL (TUR. END)	5248X1705X16	1105
13.	SIDE WALL (TUR. END)	5248X2480X16	3X1645
14	SIDE WALL (TUR. END)	5248X1670X16	1080
15.	SIDE WALL (TUR. END)	1000X350X250	200
16.	SIDE WALL (TUR. END)	5248X200X150	550
17.	SIDE WALL (GEN.END)	5248X1705X16	1105
18.	SIDE WALL (GEN.END)	5248X2480X16	3X1645
19.	SIDE WALL (GEN.END)	5248X1670X16	1080
20.	SIDE WALL (GEN.END)	1000X350X250	200
21.	SIDE WALL (GEN.END)	5850X200X150	550
22.	SHELL INTERNAL DETAILS	3650X850X625	4X4780
23.	SHELL INTERNAL DETAILS	1000X750X350	600
24.	SHELL INTERNAL DETAILS	3700X850X350	4600

APPENDIX – II

LIST OF PACKAGES, ODC DETAILS, WEIGHTS ETC.

SN	DESCRIPTION	PACKAGE SIZE IN MM	GROSS WT. IN KG.
25.	AIR EXTRACTION PIPING	5460X990X410	1200
26.	SHELL INTERNAL DETAILS	4700X3426X348	7X5400
27.	SHELL INTERNAL DETAILS	5500X940X630	8300
28.	SHELL INTERNAL DETAILS	4440X260X100	350
29.	SHELL INTERNAL DETAILS	3000X1500X500	4655
30.	LOWER DOME WALL (TUR. END)	11000X3950X910	8767
31.	LOWER DOME WALL (TUR. END)	4000X800X100	700
32.	LOWER DOME WALL (TUR. END)	900X300X300	270
33.	LOWER DOME WALL (GEN. END)	11000X3950X910	7690
34.	LOWER DOME WALL (GEN. END)	4000X800X100	700
35.	DOME WALL (GEN.END)	900X300X300	270
36.	LOWER DOME WALL (F.W /B SIDE)	7502X4046X545	6012
37.	LOWER DOME WALL (F.W/B SIDE)	6238X934X1155	1444
38.	LOWER DOME WALL (F.W/B SIDE)	1325X1150X500	550
39.	LOWER DOME WALL (R.W/B SIDE)	7550X4000X1900	6727
40.	LOWER DOME WALL (R.W/B SIDE)	6236X1134X1160	1427
41.	LOWER DOME WALL (R.W /B SIDE)	1300X1065X305	215
42.	DOME INTERNAL STIFFENING	6016X200X200	4X726
43.	DOME INTERNAL STIFFENING	3400X200X200	2X382
44.	DOME INTERNAL STIFFENING	1760X1480X1230	4300
45.	DOME INTERNAL STIF FENING	2380X1310X1100	4295
46.	UPPER DOME WALL (T/GEN.SIDE.)	6800X460X310	2X1083
47.	UPPER DOME WALL (F/W/B.SIDE.)	5880X1930X380	3635
48.	UPPER DOME WALL(LOOSE ITEMS)	5400X350X32	475
49.	UPPER DOME WALL (LOOSE ITEMS)	670X250X450	410
50.	UPPER DOME WALL LOOSE ITEMS	5880X1930X448	3270
51.	WATER BOX REMOVAL DEVICE	2500X1000X750	2600
52.	WATER BOX REMOVAL DEVICE	2000X1500X500	2135
53.	FRAME	1850X840X230	650
54.	FRAME	1840X840X230	650
55.	STEAM THROW DEVICE	1450X900X700	1040
56.	CONDENSER LOOSE ITEMS	850X250X250	30
57.	CONDENSER LOOSE ITEMS	2900X956X406	377
58.	CONDENSER LOOSE ITEMS	1000X500X500	275
59.	CONDENSER LOOSE ITEMS	1000X800X800	1450
60.	CONDENSER LOOSE ITEMS	600X320X200	6
61.	CONDENSER LOOSE ITEMS	3300X250X200	200
62.	STAND PIPE No.1	2750X420X400	60
63.	CONDENSER STAND PIPE	3150X350X330	300
64.	STAND PIPE No.2	2750X420X390	62
65.	CONDENSER TUBES (WELDED TITANIUM GRADE-2, OD 28.575 MMXTHK 0.889 MM -300 Nos. AND OD 28.575 MMX THK 0.7112 MM-15445 Nos., LENGTH OF EACH TUBE IS 11100 MM)	**SUITABLE BOXES TO BE PROVIDED BY CUSTOMER (TATA)**	49300

APPENDIX – II

LIST OF PACKAGES, ODC DETAILS, WEIGHTS ETC.

SN	DESCRIPTION	PACKAGE SIZE IN MM	GROSS WT. IN KG.
66.	CONDENSER INLET R.E. JOINTS- 2NOS.	5365X2800X3200	2X19000
67.	CONDENSER OUTLET R.E. JOINTS- 2NOS.	2950X2800X3700	2X17000
68.	CONDENSER BUTTERFLY VALVES (ELECTRICAL OPERATED, INLET & OUTLET, EACH OF DIA.- 1800MM)		4X7000
		Total	**432,413**
C:	**HEAT EXCHANGERS II) S & COOLERS**		
1.	HP HEATER 5	2300x1500x10100	31000
2.	HP HEATER 6	2300x1500x11550	40000
3.	LP HEATER 1	11600x1250x1750	12050
4.	LPH-1 LOOSE ITEMS	SUITABLE PACKAGE	400
5.	LPH-1 STAND PIPE	2200X700X500	50
6.	GLAND STEAM CONDENSER	1015X1180X1400	816
7.	GLAND STEAM CONDENSER	2100X550X400	243
8.	GLAND STEAM CONDENSER LOOSE ITMS	SUITABLE PACKAGE	260
9.	LP HEATER 2	11000x1250x1850	11150
10.	LPH-2 LOOSE ITEMS	1200X500X400	285
11.	LPH-2 LOOSE ITEMS	2600X500X350	200
12.	LPH-2 STAND PIPE	2200X700X500	100
13.	LP HEATER- 3	11000x1200x1850	11200
14.	LPH-3 LOOSE ITEMS	1200X500X400	285
15.	LPH-3 STAND PIPE	2200X700X350	100
16.	DRAIN COOLER	4650x1000x1250	3500
17.	DRAIN COOLER LOOSE ITEMS	SUITABLE PACKAGE	150
18.	TURBINE OIL COOLERS –2 NOS.	4650x1650x1980	2x7600
20.	T O C LOOSE ITEMS	750X500X200	80
21.	T O C LOOSE ITEMS	800X600X600	60
22.	EXCITER AIR COOLER	2700X850X550	892
23.	AIR COOLER	2700X850X550	892
24.	COOLER RACK ASSMBLY FOR EXCITER	3000X1800X1100	1551
		Total	**130,464**
C:	**HEAT EXCHANGER III) FST & DEAERATOR**		
1.	FST – SECTION-I	8900X4000X4300	18500
2.	FST SECTION-II	9300X4000X4300	19500
3.	FST SECTION-III	8900X4000X4300	18500
4.	DEAERATOR HEADER	9300X2400X2800	16000
5.	DEAERATOR LOOSE ITEMS STAND PIPE, SAFETY RELIEF VALVES, SPOOL PIECE ETC	LOT	1000
6.	DEAERATOR PLATFORM CARBON STEEL SCTRUCTURALS IN SECTIONS	LOT	8000
		Total	**81,500**

APPENDIX – II

LIST OF PACKAGES, ODC DETAILS, WEIGHTS ETC.

D- PUMPS WITH AUX, TANKS & VESSELS, DG SET ETC.

(I) DETAILS OF BOILER FEED PUMP PACAKGES

Sl. No.	Description	Qty	Each Size in mm	Total wt. In Kg.
1.	BFP skid (Pump assly. + Base plate+Tubing+seal coolers)	3	2250x1000x1050	3x5770
2.	Booster Pump Skid(Pump assly. + Base plate+ Tubing)	3	1650x1200x950	3x2511
3.	Grillage	3	10200x2500x900	3x5030
4.	Hydraulic Coupling assly. and accessories	3 sets	1800x1700x1800	3x3560
5.	Hydraulic Coupling working oil cooler.	3	3700x1500x500	3x1475
6.	Hydraulic Coupling lube oil cooler .	3	3100x1300x450	3x775
7.	Hydraulic Coupling loose items	3	Loose for 3 sets	3x710
8.	Suction Strainer for BP	3	900x 800x1400	3x800
9.	BFP Recirculation Valve	3	1800x550x1400	3x350
10.	Suction strainer for BFP	3	900x800x1100	3x460
11.	Local Gauge Board racks with instruments	6	2200x300x1800	6x650
12.	Loose items	1 set	loose	1x2449
13.	Motor tubing	3	4000x3000x3000	3x15000
			Total wt.	**115,672**

APPENDIX – II

LIST OF PACKAGES, ODC DETAILS, WEIGHTS ETC.

(II) DETAILS OF CONDENSATE EXTRACTION PUMPS

SN	Description	Qty.	Dimensions (mm)	Weight (Kg.)
1.	Condensate Extraction Pump Assembly	3	Dia.11000x3250	3x2100
2.	Canister	3	Dia.900x3100	3x510
3.	CEP Foundation Ring	3	1100x1100x150	3x185
4.	CEP suction Strainer	3	900x800x1400	3x800
5.	Local Gauge Board Rack	1	2000x300x1800	1x500
6.	Loose items	3 sets	Loose	3x210
7.	CEP Motors	3	2020x1810x1150	3x4000
			Total Wt.	**23,915**

III - Tanks & Vessels:

Sl.NO	DESCRIPTION	PACKAGE SIZE in (mm)	WT.IN KG
1.	HP Drain Flash Tank 1 No.	2650x3000x3950.	5000
2.	LP Drain Flash Tank - 1 No.	1950x2200x2550	3000
3.	Unit Flash Tank – 1 No.	1250x1350x2300	1000
4.	DM CW Tank (10 Cu. M)-1 No.	Dia.2500x7000H	6,000
5.	Portable Water Tank (5Cu.M)-1 No.	2000x2000x2000	3,000
6.	Clean Oil Tank (60 Cu.M)-1 No.	5000x4500x3000	10,500
7.	Dirty Oil Tank (60 Cu.M)-1 No.	5000x4500x3000	10,500
8.	Oil unloading Tank (1 Cu. M)-1 No.	1500x2500x500	600
		Total Weight	**39,600**

APPENDIX – II

LIST OF PACKAGES, ODC DETAILS, WEIGHTS ETC.

IV. DIESEL GENERATING SET: 1 DG SET (Capacity 750 KVA & & 415 V) COMPRISING OF:

i) Diesel Generator set (750 KVA, 415 V) assembled & comprising of Radiator, Base Frame, Diesel Engine and Alternator etc of size 7500x2500x3400 mm having static wt.8800 Kg.

ii) Acoustic Enclosure (will be dispatched loose & to be assembled at site)- 7100Kg.

iii) Fuel Tank (990 Litres capacity) and dimension 1250x750x1400 mm

iv) Exhaust Pipe Line:

(a) M.S. Pipe "B" Class, 8" -36 Mtrs.

(b) M.S. Short Bends-8"-8Nos.

(c) M.S. Flanges-"D: Table-8"-16 Nos.

(d) Fasteners-Lot.

(e) Flexible Bellows-2 Nos.

v) Fuel Pipe Line:

(a) M.S. Pipe "B" Class, 1" -18 Mtrs.

(b) M.S. Elbow Socket weld Type-1-10Nos.

(c) M.S. Flanges - 1"-4 Nos.

(d) Fasteners-Lot.

vI) DG set control panel of size 1550x1000x2075mm

vii) Aux. Distribution Board of size 2800x550x2250mm

viii) Battery charger with 4 Batteries for DG set starting.

ix) Battery charger with 4 Batteries for DG set control panel supply.

x) Power Cable:

(i) 3.5 Corex400 Sq. mm armoured Aluminium cable-58 Meters

(j) Aluminium lugs 400 Sq.mm-24 Nos.

(k) Aluminium lugs 185 Sq.mm-8 Nos

(l) Single compression Glands 2.3/4"-8 Nos.

xi) Control Cable:

(e) 12Cx2.5 Sq.mm, Cu. Armoured multistrand cable-15 Meters

(f) 4Cx2.5 Sq.mm, Cu. Armoured multistrand cable-40 Meters

xii) Earthing Material:

(p) GI Plate-600x600x6mm-4Nos.

(q) GI Pipe-3/4" with Funnel-22mm-4Nos.

(r) GI Chamber Cover-12"x12"-4Nos.

(s) GI Strips-50x6mm-80 Meters

xiii) Hardware:

(cc) M.S. Angle-65x65x6mm-60Meters.

(dd) M.S. Angle-50x50x6mm-72Meters.

(ee) M.S. Channel-100x50x50x6mm-60Meters.

(ff) M.S. Plates-200x200x10mm-8Nos.

(gg) M.S. Plates-300x300x16mm-4Nos.

(hh) Support Plate-300x150x8mm-4 Nos.

(ii) Support Plate-150x150x8mm-8 Nos.

(jj) Anchor Fastener Bolts-10Dia.x30 mm-50 Nos.

(kk) M.S. Flat-30x3mm-3 Meters.

(ll) G.I. Cable Tray-300x50x2mm-14 Meters.

(mm) G.I. Cable Tray-150x25x2mm-24 Meters

(nn) Champion Gasket-3mm Th.-1 sheet.

(oo) Special Tools -1 set

(pp) Dial Gauge-1 No.

xiv) AVM PADS-"S" Series / Gerb make-12 Nos.

Contractor shall carry out the installation, erection, testing and commissioning works of DG set and acoustic enclosure along with related electrical & cabling works etc. as per relevant drawings, documents and instruction of BHEL engineer at site. The tentative weight of complete DG set and with associated items/ components / accessories including electrical items like Batteries & Battery chargers, cables, cable trays, earting materials, structural steel, foundation materials etc. is about 25MT.

E. BOUGHT OUT ITEMS (BHEL HARDWAR SCOPE)

(I) TG-INTEGRAL PIPING

a. Carbon Steel & Alloy Steel piping	41.0 MT
b. Stainless Steel Piping (Including High Pressure LP Bypass valve and HP Bypass valve governing System piping.)	2.0 MT

APPENDIX – II

LIST OF PACKAGES, ODC DETAILS, WEIGHTS ETC.

(II) Bought out Equipments – 150 MT

(BB) FOR EXTERNAL PIPING/RE-GENERATIVE PIPING WITH ASSOCIATED VALVES, COMPONENTS/ITEMS, FITTING, SUPPORTS ETC.:

SN	PGMA	DESCRIPTION	WT. (KG)	IBR (I)/ NON-IBR (N)
1	80-312	LPBP Valve Upstream & Downstream	28,900	I
2	80-321	HPBP Valve to CRH Piping	5,200	I
3	80-330	Extraction Steam to LP Heater-1	6,800	I
4	80-331	Extraction Steam to LP Heater-2	3,400	I
5	80-332	Extraction Steam to LP Heater-3	4,600	I
6	80-335	Extraction Steam to Deaerating Heater	12,900	I
7	80-336	Extraction Steam to HP Heater-1	2,900	I
8	80-337	Extraction Steam to HP Heater-2	1,600	I
9	80-373	Aux. Steam Header SV Exhaust	1,200	N
10	80-375	Unlisted SV Exhausts – TG Scope	4,600	N
11	80-381	HP Heater Vents – TG Scope	900	N
12	80-382	LP Heater Vents	1,500	N
13	80-385	Vent from Unlisted PPG/Equipment to Condenser	2,300	N
14	80-387	Condensate Pump vents	1,100	N
15	80-388	Condensate Air Evacuation Piping	3,300	N
16	80-398	Turbine Washing Steam	3,700	I
17	80-400	Condensate Suction	3,200	N
18	80-401	CD from Pump to LPH-1/DC inlet TEE & Recir.	10,000	N
19	80-402	CD from LPH-1/DC inlet TEE to TG TP	6,300	N
20	80-407	Condensate For sealing of Vacuum	1,300	N
21	80-408	Condensate Dump from Header	2,200	N
22	80-411	Condensate / Make up to Condenser	2,000	N

APPENDIX – II

LIST OF PACKAGES, ODC DETAILS, WEIGHTS ETC.

SN	PGMA	DESCRIPTION	WT. (KG)	IBR (I) / NON-IBR (N)
23	80-413	Unlisted Condensate	1,100	N
24	80-440	Condenser Drains	200	N
25	80-442	Gland Steam Cooler Drains	300	N
26	80-443	LP Heater-1 to Condenser	1,500	N
27	80-444	LP Heater-2/3/4/5 Drains & Drip Pump Incl.	3,000	N
28	80-447	HP Heater Drains	9,200	N
29	80-449	TG Cycle piping Drains & Vents	7,300	N
30	80-468	Main Circulation Water Piping	120,000	N
31	80-473	Demineralised Water System (S.S.)	14,000	N
32	80-477	Service Water Piping	42,000	N
33	80-478	Drinking Water Piping	7,000	N
34	80-673	Lube Oil Piping System	4,300	N
35	80-921	H & S for Light up– Steam Line	8,000	N
36	80-922	H & S for Light up– Non Steam lines	5,000	N
37	80-923	H & S for Steam Blowing	3,000	N
38	80-924	H & S for Synchronisation- Steam Lines	2,000	N
39	80-925	H & S for Steam Blowing –Non Steam lines	2,000	N
40	80-933	H & S for LP Piping	1,500	N
41	81-415	Test Thermowells	100	N
42	81-416	Performance Guarantee Test Materials	200	N
43	XX-XXX	Root valves, Butterfly Valves, Extraction line QCNRVs, Steam Traps, ME Bellows etc.	50,000	
44	XX-XXX	Aux. PRDS a. High Capacity PRDS-1400 Kg. b. Low Capacity PRDS-600 Kg. c. CRH PRV-350 Kg.	2350	

APPENDIX – II

LIST OF PACKAGES, ODC DETAILS, WEIGHTS ETC.

SN	PGMA	DESCRIPTION	WT. (KG)	IBR (I)/ NON-IBR (N)
		TOTAL WEIGHT	**393,950**	

(CC) EQUIPMENTS/SYSTEMS, CENTRAL LUBE OIL SYSTEM, MISC. PUMPS, COLTS, DEBRIS FILTERS, PLATE HEAT EXCHANGERS, MISC. CRANES & HOISTS, SELF CLEANING STRAINERS, HP & LP DOSING SYSTEM ETC. (SUPPLIED FROM PEM/ BHOPAL AND RELATED VENDORS):

Sl.NO	DESCRIPTION	PACKAGE SIZE (mm)	Approx. WT.IN KG/ITEM
1.	**Central Lube Oil System:**		
1.1	Clean oil Pump with Drive motor, Duplex Type Strainer, Pressure Gauge& DP Gauge etc.-1 Set		450
1.2	Dirty oil pump with Drive motor, Duplex Type Strainer, Pressure Gauge& DP Gauge etc.-1 Set		450
1.3	Drain oil return pump with Drive motor, Duplex Type Strainer, Pr. Gauge& DP Gauge etc.-1 Set		450
2.	**MISC. CRANES & HOISTS**		
2.1	**Under Sling EOT Cranes.**		
2.1.1	Single Girder under Sling EOT crane for Air Compressor Building-1 No.	Capacity 8 MT, Span-9 M, Height of lift -6 M, Bay length-35 M	5,000
2.2	**Chain Pulley Blocks:**		
2.2.1	Chain Pulley Block for Elevator Machine Room in TG hall -1 No.	Capacity 3 MT, Lift-10 M and travel 5 M.	600
2.2.2	Chain Pulley Block for ACW Pumps Area in TG Hall – 1 No.	Capacity 3 MT, Lift-8.5 M and travel 22M.	600
2.2.3	Chain Pulley Block for DMCW Pumps Area in TG Hall – 1 No.	Capacity 3 MT, Lift-8.5 M and travel 22M.	600
2.2.4	Chain Pulley Block for DMCW SG Booster Pumps Area– 1 No.	Capacity 3 MT, Lift-8.5 M and travel 11M.	600
2.2.5	Chain Pulley Block for Vacuum Pumps in TG hall Area – 2 No.	Capacity 3 MT, Lift-8.5M and travel 10M.	2x600

APPENDIX – II

LIST OF PACKAGES, ODC DETAILS, WEIGHTS ETC.

Sl.NO	DESCRIPTION	PACKAGE SIZE (mm)	Approx. WT.IN KG/ITEM
2.2.6	Chain Pulley Block in A/C Plant Room area – 1 No.	Capacity 2 MT, Lift-5 M and travel 12 M	500
2.2.7	Chain Pulley Block (without travelling trolley) for Air Washer Room- 2 Nos.	Capacity 2 MT, Lift-5 M	2x500
2.2.8	Structural materials for fixing of above Misc. cranes and hoists.	Structural materials comprising of ISMB-250, Square 50x50 bar, Rails etc.	5,000
3.	**Plate Heat Exchangers** with associated components/ items, attachment, fittings etc.- 3 **sets.**	Each of size- H-2776XL -3950XW -1370 mm and weight-8000 kg	3x8,000
4.	Debris filters with associated components/items, attachment, fittings etc. **– 2Sets**	Each weighing about 8500Kg.	2x8,500
5.	Self Cleaning Strainers- 2Sets	Each weighing about 1750 Kg.	2x1,750
6.	Condenser On Load Tube Cleaning System **(COLTS)-** 2Sets (each set weighing about-8050 Kg.	Each set comprising of (i) Ball Injection Pipes-8 Nos.-30 Kg. (ii) Ball re-circulating skid- 1320Kg. (iii) Ball Separator-/Ball collector strainer-6200Kg. (iv) D.P. Measuring system-500 Kg.	
7.	**Misc. Pumps**		
7.1	**Sump Pumps:**		
7.1.1	Sump Pumps (permanent installed non clog Submersible Motor Type in TG hall)-2 sets, (each pump of capacity 30 Cu. M/hr & Head 20MWC to handle sea water)	Each set comprising of accessories like: (i) 25 Meter long Hose pipe (ii) 25 Meter long Power Cable	2x1,500

APPENDIX – II

LIST OF PACKAGES, ODC DETAILS, WEIGHTS ETC.

Sl.NO	DESCRIPTION	PACKAGE SIZE (mm)	Approx. WT.IN KG/ITEM
		(ii) Lifting Chain (iii) Pump Strainer (v) Wall mount control Panel etc.	
7.1.2	Sump Pumps (Portable non clog Submersible installed Motor type for D row & E row of TG Building)-1 set (Capacity 40 Cu. M/hr & Head 20MWC to handle sea water)	Set comprising of accessories like: (i) 25 m long Hose pipe (ii) 25 m long Power Cable (iii) Lifting Chain (iv) Pump Strainer (v) Trolley mount control Panel etc.	1x1,500
7.1.3	Sump Pumps (Portable non clog Submersible installed Motor Type for General purpose)-3 sets (each of capacity 40 Cu. M/hr & Head 20MWC to handle sea water)	Each Set comprising of accessories like: (i) 25 Meter long Hose pipe (ii) 25 Meter long Power Cable (iii) Lifting Chain (iv) Pump Strainer (v) Trolley mount control Panel etc.	3x1,500
7.1.4	Sump Pumps (for fly ash Silo are applied by Ash Handling Plant package vendor of BHEL)- 2 sets (each of capacity 30 Cu. M/hr & Head 20MWC to handle sea water)		2x4,000
7.2	ACW Pumps (Horizontal)- 3 Sets in TG hall (Each of capacity 1225 Cu. M/Hr., Head 50 MWC to handle Sea Water	Each of size-H-1500XL-3560XW-1200 mm and weight-3000 kg	3x5,000
7.3	DMCW Pumps (Horizontal)- 3 Sets (Each of capacity 975 Cu. M/Hr., Head 60 MWC to Passivated DM Water	Each of size-H-2000XL-4560XW-1500 mm and weight-4500 kg	3x4,000

APPENDIX – II

LIST OF PACKAGES, ODC DETAILS, WEIGHTS ETC.

Sl.NO	DESCRIPTION	PACKAGE SIZE (mm)	Approx. WT.IN KG/ITEM
7.4	DM CW Booster Pumps (Horizontal)- 2 Sets (Each of capacity 450 Cu. M/Hr., Head 50 MWC to Passivated DM Water	Each of size-H-1000XL-1985XW-900 mm and weight-1200 kg	2x3,000
7.5	Service Water (Horizontal)- 1 Set (Each of capacity 150 Cu. M/Hr., Head 60 MWC to clarified Water	Each of size-H-1000XL-1985XW-900 mm and weight-1200 kg	1x1,500
7.6	Hot Well Make up Pumps (Horizontal) - 2 Sets (Each of capacity 70 Cu. M/Hr., Head 60 MWC to handle DM Water		2x1,000
7.7	Cond. Trf. Pumps (Horizontal) - 2 Sets (Each of capacity 70 Cu. M/Hr., Head 6 0 MWC to handle DM Water	Each of size-H-1200XL-1700XW-650 mm and weight-1000 kg	2x1,000
7.8	Boiler Fill Pumps (Horizontal) - 1 Set (Capacity 130 Cu. M/Hr., Head 60 MWC to handle DM Water	Each of size-H-1100XL-2500XW-700 mm and weight-1500 kg	1x2,000
8.	**LP Chemical Dosing System**		
8.1	Hydrazine Dosing system -1 No.	2500x5250x3000	5,000
8.2	Ammonia Dosing Sysetm -1 No.	2500x5250x3000	5,000
8.3	NaOH Dosing System	2000x2000x2000	2,500
9.	**HP Chemical Dosing System**		
9.1	Phosphate Dosing system	2000x2000x2000	7,000
		TOTAL WEIGHT (SAY 154 MT)	**154,050**

NOTE:

1. The list is tentative and has been given to enable the contractor to study & understand the nature of work to be carried out in this contract. There may be variation in size, weight etc. and no claim, whatsoever, will be entertained on account of any variation by BHEL.
2. Some of the packages may be sent in parts to suit the site condition/ transportation, the same is to be assembled at site without any extra cost, likewise the packages may be assembled together and send as a single assy. Contractor may have to dismantle and erect or, erect as single assembly as per the instruction of BHEL Engineers without any extra cost.

APPENDIX – III

SUMMARY OF TENTATIVE WEIGHT SCHEDULE

SN	EQUIPMENT / PACKAGE	APPROX. WT. (MT)
A.	STEAM TURBINE & AUX.	600
B.	TURBO GENERATOR & AUX.	375
C.	CONDENSER WITH AUX,	433
D.	HEATERS, DEAERATORS ETC. (HEAT EXCHANGERS)	212
E.	BOILER FEED PUMPS & AUX.	116
F.	CONDENSATE EXTRACTION PUMPS & AUX.	24
G.	FLASH TANK & VESSELS	40
H.	DG SET WITH AUX.	25
I.	TG INTEGRAL PIPING	43
J.	HP BYPASS VALVES WITH OIL SYSTEM AND SKID	4
K.	BOUGHT OUT ITEMS (BHEL Haridwar Scope) + GEN. AUX.	150
	TOTAL WT.	**2022**

Details as in above table correspond to Item SN 01 of Rate Schedule. Broad description of the Equipment/Package has been furnished here for general guidance of the bidder. Contractor shall carry out the work of all these equipment/ packages in totality including all their accessories even though names of such accessories may not be specifically appearing in this Tender Specs.

L. EXTERNAL/RE-GENERATIVE PIPING SYSTEM WITH VALVES, H & S, FITTINGS AND OTHER RELATED PEM BOUGHT OUT ITEMS:

(i) Carbon steel & Alloy Steel Piping: 380 MT (Item 02.A of Rate Schedule)

(ii) Stainless Steel Piping: 14 MT (Item 02.B of Rate Schedule)

M. EQUIPMENTS/SYSTEMS OF CENTRAL LUBE OIL SYSTEM, MISC. PUMPS, CONDENSE ON-LOAD TUBE CLEANING SYSTEM, DEBRIS FILTERS, PLATE HEAT EXCHANGERS, MISC. CRANES & HOISTS, SELF CLEANING STRAINERS, HP & LP DOSING SYSTEM ETC: **154 MT (Item 03 of Rate Schedule)**

NOTE:

The details indicated above are approximate and there is likelihood of variations in weight & quantity of equipment/package/system. Variations will be dealt with in accordance with relevant provisions available in Section-11 of Special Conditions of Contract.

APPENDIX – IV

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

SN	Description & Capacity of T&P	Quantity	Purpose
01	EOT Crane in TG hall 80/25 MT capacity	01 No	EOT crane for handling and Erection between **A-D Bay of TG building**, subject to its capacity & accessibility / approachability.

NOTE:

Complete operation of EOT crane along with providing the operator, day today operation/ maintenance, general cleanliness, attending of gear box leakages etc., applying caladium Compound on slings and holding / supporting the supply cables etc. provided by the contractor as per requirement.

EOT crane will be used on sharing basis by other agencies working within the TG hall under the instruction of BHEL Engineer In-charge. Contractor has to plan his activities well in advance and inform BHEL engineer In-charge / Construction Manager the date of actual use. Contractor shall extend the services of EOT crane operator with EOT crane for the other agencies as per instruction of BHEL Engineer In-charge at site as part of scope of work to whom, the services of EOT crane has been allotted/ recommended by BHEL Engineer In-charge.

As above crane will be shared with other agencies / contractors of BHEL. The requirement of crane shall be planned well in advance with indenting procedure in consultation/ direction of BHEL engineer at site and with allocation of crane shall be as decided by BHEL engineer and his decision shall be binding on contractor.

HP Heaters (Horizontal Type), LP Heaters (Horizontal Type) are to be located in D-E Bay of TG Building at their designed foundations which are at elevation of 15.8M & 09.30M respectively. The customer's EOT crane 80/25T is located in A-D Bay of TG Building and as such this EOT crane may not have direct accessibility /approachability to handle and place these equipments to their foundations. Contractor may make use of this EOT crane as per prior approval of BHEL/Customer engineer subject to its readiness and approachability to carry out lifting and placement of these equipments to nearest location by using additional platform etc. along with dragging arrangements, wherever required. Contractor shall make his own arrangement of such requirements for shifting/dragging/making additional platforms etc. to place and assembled/ install these equipments to their respective designed foundations & elevations as part of scope of work. BHEL / Customer shall not provide any additional arrangements/infrastructure for this purpose.

LP heater-1 is to be mounted & assembled/erected inside the Condenser at elevation of about 10.50 meter.

Boiler feed pumps with Auxiliaries are to be installed/erection between D-E Bay of TG Building at an elevation about 00.30M. Customer has got plan of 25T capacity EOT Crane for maintenance purpose of these Aux. in D-E Bay. Contractor may make use of this EOT Crane for erection of these equipments on its readiness and with prior approval of BHEL / Customer engineer at site. However till such time the above EOT crane is made ready, contractor shall make alternate arrangement for placement and installation of these equipments as part of scope of work so that the progress of work is not affected. Wherever required, Contractor shall have to provide the crane operator for his use of this EOT crane.

APPENDIX –V

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

A: TOOL & PLANTS

SL.NO.	DESCRIPTION	QUANTITY
01.	CRANES (OF SUITABLE CAPACITY)	AS PER REQUIREMENT
02.	TRAILER WITH HORSE (SUITABLE CAPACITY)	-DO-
03.	TRACTOR TROLLEY (SUTABLE CAPACITY)	-DO-
04.	WELDING GENERATOR SETS (SUFFICIENT QUNTITY) (ELECTRIC AS WELL DIESEL)	-DO-
05.	3- PHASE COMPLETE SET UP FOR DRAWAL OFPOWER	-DO-
06.	RADIOGRAPHY ARRANGEMENT INCLUDING THE SOURCE AND FILM VIEWER	-DO-
07.	TIG WELDING SETS (SUFFICIENT QUNTITY)	-DO-
08.	STRESS RELIEVING EQUIPMENTWITH TEMPERATURE RECORDERS	-DO-
09.	ELECRTRICAL BAKING OVEN – BIG	-DO-
10.	ELECTRODE BAKING OVEN -- PORTABLE	-DO-
11.	MIXER FOR GROUTING OF EQUIPMENT FOUNDATIONS	-DO-
12.	VACUUM CLEANER (INDUSTRIAL)	-DO-
13.	PIPE CUTTING AND BEVELLING MACHINE	-DO-
14.	PIPE BENDING M/C (ELECTRIC/ ELECTRO-HYDRAULIC-UPTO 4" SIZE)	-DO-
15.	AIR COMPRESSOR 120 CFM	01 NO
16.	STEP DOWN TRANSFORMER, 230V/24V	AS PER REQUIREMENT
17.	CONDENSER TUBE EXPANDER SET	-DO-
18.	ELECTRICALLY OPERATED WINCHES 3T/5T CAP.	-DO-
19.	JACKING BOLTS / PRESSOUT BOLTS OF ALL SIZES (FOR ST. TURBINE ROLL CHECKS ETC.)	-DO-

20. HYDRAULIC JACKS OF VARIOUS CAPACITIES FORST. TURBINE AND GENERATOR:

- JACKS OF 100 T CAPACITY 04 NOS (WITH HAND OPERATED PUMPS)
- JACKS OF 50 T CAPACITY 04 NOS. (- DO -)
- GANG OPERATED JACKS CONSISTING OF THE FOLLOWING:
- JACKS OF 100 T CAPACITY 04 NOS (HAVING BROAD BASE ONE INCH LIFT)
- LONG HIGH PRESSURE HOSES 12 NOS.(FOR GENERATOR ALIGNMENT)

ABOVE JACKS FOR GENERATOR ALIGNMENT SHOULD HAVE SUITABLE COUPLING FOR JOINING THE TWO OR MORE HOSES TOGETHER TO GET DESIRED LENGTH OF HOSES, SHOULD HAVE HAND OPERATED PUMPS & ALSO SHOULD BE ABLE TO FIT WITH HYDRAULIC UNIT.

APPENDIX –V

21.TORQUE WRENCH	0 TO 200 N-M CAP.	01 NO.
22.TORQE WRENCH	UPTO 2000 N-M CAP.	01 NO.
23. SLINGS FOR	LP TURBINE ROTOR	01 SET
24. SLINGS FOR	HP TURBINE MODULE	01 SET
25. SLINGS FOR	GENERATOR ROTOR	01 SET
26. BOLT STRETCHING DEVICE (FOR TURBINE & GENERATOR FDN. BOLTS)		AS PER REQUIREMENT
27. LONG FEELER GAUGE SET		AS PER REQUIREMENT
28. SPANNERS / EYE BOLTS (OF ALL SIZES)		AS PER REQUIREMENT
29. CHEMICAL CLEANING PUMPS WITH STARTER, MOTOR, CABLES, ETC.- OF REQUIRED QUANTITY & CAPACITY)		**AS PER REQUIREMENT**
30. Pressurising Pump for Hydraulic Testing of Pipe lines : 450 Kg/cm2 with flow rate of 25 to 30 LPM with starter & Cables		**As per requirement**
31. Hand Operated Hydraulic Test Pump of suitable capacity. –		**as per requirement.**

ANY OTHER MAJOR T&P REQUIRED FOR SATISFACTORY COMPLETION OF THE WORKS.

B: MEASURING AND MONITORING DEVISES (MMD):

AS PER REQUIREMENT TO BE FINALIZED AT SITE.

NOTE :

THIS ABOVE LIST IS ONLY INDICATIVE AND NEITHER EXHAUSTIVE NOR LIMITING. QUANTITIES INDICATED ABOVE ARE ONLY THE MINIMUM REQUIRED. CONTRACTOR SHALL DEPLOY ALL NECESSARY T&P TO MEET THE SCHEDULES & AS PRESCRIBED BY BHEL ENGINEER AND REQUIRED FOR COMPLETION OF WORK.

APPENDIX –VI

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		
TOTAL		100%	

SIGNATURE OF THE TENDERER

DATE:

APPENDIX –VII

FORMAT FOR MONTH-WISE MANPOWER DEPLOYMENT PLAN FOR EACH UNIT

(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											

*Please use additional sheets in same format for additional period.

SIGNATURE OF TENDERER

DATE:

APPENDIX –VIII

FORMAT FOR DEPLOYMENT PLAN FOR MAJOR TOOLS AND PLANTS

SL. NO.	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 Tenderer

APPENDIX – IX

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	ANTICIPA-TED COMPLN. DATE	REMARKS

SIGNATURE OF THE TENDERER

DATE:

APPENDIX - X

DETAILS OF SIMILAR WORK DONE DURING THE LAST SEVEN YEARS

SN	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								

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

DATE

SIGNATURE OF TENDERER WITH SEAL

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
Bharat Heavy Electricals Limited
(A Govt. of India Undertaking)
Power Sector, Western Region,
345, Kingsway, Nagpur - 440 001
PHONE:-3048600-604 FAX:-0712- 3048605/3048698/3048699

NOTICE INVITING TENDER (Page 1 of 3)

Sealed tenders are invited for job listed below from bidders meeting Qualifying Requirements (QR). Brief description of job and Tender Specification (T. S.) number are as under.

1. T. S. No. BHE/PW/PUR/TRT-STG/506

Job: ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING AND HANDING OVER OF **STEAM TURBINE, TURBO-GENERATOR** (INCLUDING ITS RECEIPT FROM TRAILER, HANDLING, LIFTING & PLACEMENT ON FOUNDATION), CONDENSER WITH R.E. JOINTS & BUTTERFLY VALVES, TG INTEGRAL PIPING, EXTERNAL/ REGENERATIVE PIPING, EQUIPMENTS / TANKS / VESSELS, HP & LP HEATERS, DEAERATOR WITH ASSOCIATED PLATFORM, HP & LP BYPASS SYSTEM, POWER CYCLE PUMPS WITH ASSOCIATED AUXILIARIES ETC. INCLUDING BOUGHT OUT ITEMS, PEM PACKAGES LIKE CENTRAL LUBE OIL SYSTEM, MISC. PUMPS, COLTS, DEBRIS FILTERS, PLATE HEAT EXCHANGER, MISC. CRANES & HOISTS, SLEF CLEANI NG STRAINERS ETC. AND DG SET OF **1x250 MW UNIT # 8 AT TROMBAY THERMAL POWER GENERATING STATIONTATA POWER COMPANY LTD. TROMBAY, MUMBAI MAHARASHTRA**

- **Issue of T. S. Documents:** **from 12/07/2007 to 01/08/2007***
- **Last Date for Tender Submission:** **02/08/2007***
- **Date of Opening Technical Bid:** **03/08/2007***

* **Please obtain latest update with regard to these dates in our web page www.bhel.com → Tender Notifications → View Corrigendum.**

EMD: Please refer relevant section of Special Conditions of Contract.

- Tender Specs documents with complete details are hosted in web page (www.bhel.com). Bidders can directly download the same and use for submission of offer. Tender Document charges shall be paid to BHEL along with or before submission of Offer.
- Interested bidders may alternately collect hard copy of T.S. documents from this office on all working days within the sale period on payment of Tender Document charges.
- Tender Specification document Charges: Rs. 2,000/- by DD (in favour of BHEL payable at Nagpur) or by Cash. Courier charges will be Rs. 500/- extra if T.S. documents are requested through courier.
- BHEL takes no responsibility for delay/loss of documents/correspondences sent by courier/post.
- Bidders who have deposited One Time EMD of Rs. 2.00 Lakhs with BHEL:PSWR: Nagpur will be exempted from submission of EMD with these tenders.
- BHEL reserves the right to accept or reject any or all tenders without assigning any reasons whatsoever.
- All corrigenda, addenda, amendments and clarifications to Tender Specifications will be hosted in the web page (**www.bhel.com ® Tender Notifications ® View Corrigendums**) and not in the newspaper. Bidders shall keep themselves updated with all such developments.
- BHEL reserves the right to reject any tender on the basis of unsatisfactory performance of the bidder in any ongoing job or any similar job in the last seven years or for furnishing false information/declaration in the offer.
- BHEL will operate CPSE purchase preference policy if applicable.
- **BHEL reserves the right to adopt the process of Reverse Auction (on-line bidding) among the bidders who are found to be qualified on the basis of Technical Bid. Details of Reverse Auction process are furnished after this section (NIT) under title "Reverse Auction Procedure". Date of On-Line Bidding/Reverse Auction will be intimated to all technically qualified bidders later. In case the option of On-Line Bidding/Reverse Auction is not exercised by BHEL, the sealed Price Bid of technically qualified bidders shall be considered for further processing of the offer and evaluation.**

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NOTICE INVITING TENDER (Page 2 of 3)

Qualifying Requirements (QR)

Bidder shall essentially fulfill the Qualifying Requirements (QR) as stated below.

a) Bidder must have successfully completed Erection, Testing and Assistance for Commissioning (synchronization of the unit or beyond) of at least one unit of 120 MW or higher rating OR at least two units of 60 MW each or higher rating Steam Turbine with Turbo-generator sets in the last seven years as on 30/06/2007.

AND

b) Bidders must have achieved an average annual financial turnover of Rs. 120 crore or more over last three Financial Years (FY) ending on 31/03/2007 or 31/03/2006 if the annual accounts of FY 2006-2007 have not been audited.

AND

c) Net worth of the Bidder based on the latest Audited Accounts as furnished by Bidder in case of 'b' above should be higher than 50% of the Paid-up Capital in case of Companies.

AND

d) Bidder must have earned cash profit in any one of the three Financial Years as applicable in case of 'b' above based on latest Audited Accounts.

AND

e) Bidder's offer will be accepted subject to the approval by BHEL's client M/s Tata Power Limited.

GENERAL

1) Timing of sale of Documents: Tender Specification (T. S.) documents will be issued from BHEL: PSWR: Nagpur office from 10:00 am to 4:00 pm on all working days within the period as listed in the NIT.

2) Holidays:
Sale of Tender Documents shall not take place on the holidays as listed under and also on Sundays.

- 14/07/2007
- 28/07/2007

3) Seeking Clarifications on Tender Specification:
Clarifications on the Tender Specifications, if any, may be sought by the bidders so as to reach this office at least seven days before the Last Date for tender submission.

4) Fulfilment of Qualifying Requirements:

A bidder must satisfy all the Qualifying Requirements enumerated as 'a', 'b' etc. for this tender concurrently in order to get qualified.

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NOTICE INVITING TENDER (Page 3 of 3)

5) Supporting Documents for QR:
Bidders shall submit documents in support of possessing "Qualifying Requirements" as under duly self-certified and stamped by the authorized signatory.

- List of jobs done with Name of the Project, Owner of Project, Name of Customer, Work Order Ref. No. & Date, Brief Details of Job, Executed Value, Date of Start, Date of Completion.
- Photocopies of Work Orders issued by the Customer containing details of Bill of Quantities/Schedule of Rates.
- Photocopies of Completion Certificate issued by Customer or Owner of Project.
- Photocopies of audited Profit and Loss accounts accompanied by relevant schedules for turnover figures.

6) Earnest Money Deposit (EMD): Refundable, Non-interest bearing EMD for each tender is indicated in the Tender Specification. Bidders may also opt to deposit "One Time EMD" of Rs. 2.0 lacs and thus be exempted henceforth from payment of EMD with each Erection and Commissioning tender of BHEL-PSWR Nagpur. EMD shall be paid ONLY by Account Payee Demand Draft in favour of "Bharat Heavy Electricals Limited" payable at Nagpur.

Those bidders who have already deposited 'One Time EMD' earlier need not submit EMD with the present tender. Bidder shall indicate the payment details of the 'One Time EMD' in their tender.

7) Tender Specification Document Cost and Courier Charges:
Charges for T. S. document @ Rs. 2,000/- per T. S. and Courier Charges @ Rs. 500/- per T.S. shall be made by Account Payee Demand Draft in favour of "Bharat Heavy Electricals Limited" payable at Nagpur or in Cash payable at the cash counter of this office. Courier charges shall be paid in case bidder request for dispatch of Tender Specification documents by courier. In case bidders download the T.S. documents etc. from web page, they shall remit the Tender Document charges (Rs. 2,000/-) positively along with or before submission of offer.

8) Liquidated Damages/Penalty: BHEL will impose Liquidated Damages and Penalty as per suitable clauses in the respective Tender Specifications on account of delay, violation of contract conditions and non-performance attributable to the contractor.

DGM (Purchase)
BHEL: PSWR: Nagpur

BHEL: PSWR: Nagpur

Reverse Auction Procedure (Page 1 of 11)

The following document shall be a part of Tender Specification No. BHE/PW/PUR/TRT-STG/506. Bidders may refer the NIT wherein BHEL has reserved the rights to adopt the process of Reverse Auction (On-line bidding) among the bidders who get qualified based on technical bid evaluation.

The process and documentation required for the Reverse Auction shall be as mentioned below:

First, technical bids of the offers submitted by the bidders will be opened by BHEL and documents will be scrutinized, If the documents are not found satisfactory, then the Bidder may be asked to submit the relevant documents depending on time available with BHEL. In case of unsatisfactory details, the Bidder will be disqualified and will not be able to participate in price bid process.

1) Bidders have to submit a certificate of their acceptance to the terms/ conditions/ modality given in this amendment for participating in the reverse auction.

2) Bidders who get qualified in technical bid will be intimated by BHEL. Then, the Bidder is required to submit the Agreement Form (Process Compliance Form –RA-3) duly signed to C1 India Pvt. Ltd. by (AUCTION DATE). After receipt of the Agreement Form, Log in ID & Password shall be allotted to the suppliers (bidders).

3) After completion of reverse auction process: Successful Bidder shall be required to submit the final prices, quoted during the English Reverse (no ties) in given Format after the completion of Auction to C1 India and BHEL, duly signed and stamped as token of acceptance without any new condition other than those already agreed to before start of auction.

4) Bidders are required to sign all the pages of this Amendment as a token of unconditional acceptance of the process of Reverse Auction and submit along with the Technical Bid.

If documents as above are not furnished along with the Technical Bid, Bidder will be considered non-responsive and will be disqualified from the tendering process.

Business Rule & terms & conditions of reverse auction

BUYER'S NAME	BHARAT HEAVY ELECTRICALS LIMITED POWER SECTOR WESTERN REGION, NAGPUR
AUCTION TO BE CONDUCTD BY	C1 INDIA PVT. LTD. D-5, DEFENCE COLONY NEW DELHI- 110024 https://auctions.gate2biz.net
JOB DESCRIPTION	RECEIPT OF MATERIALS FROM BHEL / CUSTOMER STORES / STORAGE YARD, HANDLING AT STORES/STORAGE YARD, SITE OF WORK, TRANSPORTATION TO SITE OF WORK,ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING AND HANDING OVER OF STEAM TURBINE, TURBO-GENERATOR (INCLUDING ITS RECEIPT FROM TRAILER, HANDLING, LIFTING & PLACEMENT ON FOUNDATION), CONDENSER WITH R.E. JOINTS & BUTTERFLY VALVES, TG INTEGRAL PIPING, EXTERNAL/ REGENERATIVE PIPING, EQUIPMENTS / TANKS / VESSELS, HP & LP HEATERS, DE AERATOR WITH ASSOCIATED PLATFORM, HP & LP BYPASS SYSTEM, POWER CYCLE PUMPS WITH ASSOCIATED AUXILIARIES ETC. INCLUDING BOUGHT OUT ITEMS, PEM PACKAGES LIKE CENTRAL LUBE OIL SYSTEM, MISC. PUMPS, COLTS, DEBRIS FILTERS, PLATE HEAT EXCHANGER, MISC. CRANES & HOISTS, SLEF CLEANING STRAINERS ETC. AND DG SET OF 1x250 MW UNIT # 8 AT TROMBAY THERMAL POWER GENERATING STATIONTATA POWER COMPANY LTD. TROMBAY, MUMBAI MAHARASHTRA
DATES FOR ON-LINE TRAINING TO VENDERS	Will be informed later by BHEL
DATE OF AUCTION	Will be informed later by BHEL
DOCUMENTS ATTACHED	1) Business rule for reverse auction (RA-1) 2) Terms & conditions of reverse auction (RA-2) 3) Process Compliance Statement (RA-3) 4) Final price quoted during reverse auction (RA-4) 5) Opening bid amount same as quoted in sealed price bid.(RA-5) 6) Contact information- (RA-6)

BHEL: PSWR: Nagpur

Reverse Auction Procedure (Page 3 of 11)

RA-1

Business Rules

JOB: RECEIPT OF MATERIALS FROM BHEL / CUSTOMER STORES / STORAGE YARD, HANDLING AT STORES/STORAGE YARD, SITE OF WORK, TRANSPORTATION TO SITE OF WORK,ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING AND HANDING OVER OF STEAM TURBINE, TURBO-GENERATOR (INCLUDING ITS RECEIPT FROM TRAILER, HANDLING, LIFTING & PLACEMENT ON FOUNDATION), CONDENSER WITH R.E. JOINTS & BUTTERFLY VALVES, TG INTEGRAL PIPING, EXTERNAL/ REGENERATIVE PIPING, EQUIPMENTS / TANKS / VESSELS, HP & LP HEATERS, DEAERATOR WITH ASSOCIATED PLATFORM, HP & LP BYPASS SYSTEM, POWER CYCLE PUMPS WITH ASSOCIATED AUXILIARIES ETC. INCLUDING BOUGHT OUT ITEMS, PEM PACKAGES LIKE CENTRAL LUBE OIL SYSTEM, MISC. PUMPS, COLTS, DEBRIS FILTERS, PLATE HEAT EXCHANGER, MISC. CRANES & HOISTS, SLEF CLEANING STRAINERS ETC. AND DG SET OF 1x250 MW UNIT # 8 AT TROMBAY THERMAL POWER GENERATING STATIONTATA POWER COMPANY LTD. TROMBAY, MUMBAI MAHARASHTRA

BHEL reserves the right to finalize the contract for the job stated above through Reverse Auction mode. BHEL has made arrangement with M/s C1 India Pvt. Ltd., Delhi, who shall be BHEL's authorized service provider for the same. Please go through the guidelines given below.

1. Computerized reverse auction shall be conducted by BHEL, on the date intimated by BHEL, while the vendors shall be quoting from their own offices/ place of their choice. Internet connectivity shall have to be ensured by each agency themselves. In extreme case of failure of Internet connectivity, (due to unforeseen circumstances- not power failure), fax communication shall have to be made immediately. BHEL/M/s C1 India Pvt. Ltd .may decide to extend the bidding time, at their discretion, but not as right of the Bidder.

2. M/s C1 India Pvt. Ltd. shall arrange to demonstrate/ train your nominated person(s), without any cost to you. They shall also explain to the Bidders, all the Rules related to the Reverse Auction/ Business Rules Document to be adopted along with Bid Manual. You are required to give your compliance on it before start of bid process.

3. Procedure of Reverse Auctioning

   i. Online sealed bid: The opening bid of the bidders as communicated online to C1 India Pvt. Ltd. shall be same as that quoted in their Final Sealed Price Bid (hard copy) submitted to BHEL along with their offer. The "Opening Bid" amount shall also be the same as the Total amount as given in the Excel Sheet(Soft copy) furnished to C1 India Pvt. Ltd. C1 India Pvt. Ltd. Shall cross check the "Opening Bid" amount with the Total Amount as given in Excel sheet. If the two amounts are not the same, the Bidder's offer shall not be considered for further processing. While submitting their offer to BHEL, the bidders shall confirm in writing to BHEL that their Opening Bid will be the same as that quoted in their final sealed Price Bid (hard copy) submitted to BHEL, against the Tender Enquiry (Format No-RA5). If it is found to be otherwise at a later date, the bidder will be disqualified from the tender.

   ii. English Reverse (no ties) {Dynamic Reverse Auction} : Opening Price (OP) for starting the Reverse Auction will be the lowest Online Sealed Bid submitted online to C1 India Pvt. Ltd. Opening Price shall be visible to all the vendors at the start of the Dynamic Reverse Auction.. C1 India Pvt. Ltd. will start the Reverse Auction process, after due verifications of "Opening Bid" amount, as detailed at Sl. No. 1 above. You shall be required to start bidding now, from this Opening Price.

   iii. The Minimum Bid Decrement amount shall be specified by BHEL before start of bidding.

iv. Bidder has to submit the price bid in excel sheet as given by M/s C1 India Pvt. Ltd.. In this excel sheet, bidder has to fill the item rates in figures. Bidders are to note that the Excel Sheet that will be provided to Bidders will be a Protected Worksheet In this worksheet the columns where Rates for individual Items (in figures) are to be filled in by the Bidder alone will be unprotected. Rates in figures will be automatically converted to words in the column for Rate in words. Conversion to words is being done through a macro. Bidders are required to take care of the settings of the computer to enable this macro to run. For this purpose, following shall be ensured: To enable the Macros – Tools→Macro→Security. Set Security to "Medium". Close all the Microsoft Office Applications. Again open the file and enable the macros. This excel sheet will then automatically calculate the amount for each item and total cost of all items put together.

v. During reverse auction, bidders have to give decrement only on the total cost. Bidders are not allowed to change any item rate as given in Excel sheet.

vi. Bidder should ensure that the rates quoted in excel sheet should be same as quoted in Price Bid (Hard copy of excel sheet) submitted directly to BHEL. In case of any variation in the rates of excel sheet (soft copy) and hard copy submitted by bidder as a sealed price bid, BHEL will disqualify the bidder and his price will not be considered for evaluation of bid.

vii. After the completion of English Reverse (no ties), the Closing Price (CP) shall be available for further processing.

4. Successful vendor shall be required to submit the final prices, quoted during the English Reverse (no ties) in given Format after the completion of Auction to BHEL, duly signed and stamped as token of acceptance without any new condition other than those already agreed to before start of auction.

5. Considering the initial quoted price and final quoted price after the reverse auction, BHEL will proportionately reduce the rates of individual items. (i.e. suppose the total price quoted by bidder in excel sheet & sealed price bid is X and after reverse auction the total price is Y, then rate of each item quoted by the bidder will be worked out as initial rate quoted multiplied by (Y/X). The value of Y/X shall be considered upto two decimals only.

6. English Reverse (no ties) shall be for a period of 60 minutes. If a bidder places a Bid in the last 5 minutes of Closing of the Auction, the auction shall get extended automatically for another 5 minutes. In case, there is no Bid in the last 5 minutes of closing of Auction, the Auction shall get closed automatically without any extension.

7. During English Reverse (no ties), if no bid is received within the specified time, BHEL, at its discretion, may decide to revise Opening price/ scrap the reverse auction process/ proceed with conventional mode of tendering.

8. Your bid will be taken as an offer to execute the work. Bids once made by you, cannot be cancelled/withdrawn and you shall be bound to execute the work as mentioned above at your final bid price. Should you back out and do not execute the contract as per the rates quoted, BHEL shall take action as appropriate.

9. You shall be assigned a Unique User Name & Password by BHEL or/ M/s C1 India Pvt. Limited. You are advised to change the Password and edit the information in the Registration Page after the receipt of initial Password from BHEL/ M/s C1 to ensure confidentiality. All bids made from the Login ID given to you will be deemed to have been made by your company.

BHEL: PSWR: Nagpur

Reverse Auction Procedure (Page 5 of 11)

10. You shall be able to view the following on your screen along with the necessary fields in the English Reverse (no ties) { Reverse Auction} :
    a. Leading Bid in the Auction (only price)
    b. Bid Placed by you
    c. Opening Price.

11. At the end of the Reverse Auction, BHEL will decide upon the winner. BHEL's decision on award of Contract shall be final and binding on all the Bidders.

12. BHEL shall be at liberty to call the lowest bidder for negotiations / cancel the reverse auction process / tender at any time, before ordering, without assigning any reason.

13. BHEL shall not have any liability to bidders for any interruption or delay in access to the site irrespective of the cause.

14. Other terms and conditions shall be as per techno-commercial enquiry.

15. You are required to submit your acceptance to the terms/ conditions/ modality given above before participating in the reverse auction.

RA-2

TERMS AND CONDITIONS OF REVERSE AUCTION

1. LOG IN NAME & PASSWORD: Each Bidder is assigned a Unique User Name & Password by C1 India. The Bidders are requested to change the Password and edit the information in the Registration Page after the receipt of initial Password from C1 India. All bids made from the Login ID given to the bidder will be deemed to have been made by the bidder.

2. BIDS PLACED BY BIDDER: The bid of the bidder will be taken to be an offer to execute the work. Bids once made by the bidder cannot be cancelled. The bidder is bound to execute the work as mentioned above at the price that they bid. Should any bidder back out and do not execute the contract as per the rates quoted, BHEL and / or C 1 India Pvt. Ltd. shall take action as appropriate.

3. LOWEST BID OF A BIDDER: In case the bidder submits more than one bid, the lowest bid will be considered as the bidder's final offer to execute the work

4. AUCTION TYPE: 1) Sealed bid Reverse Auction / Initial Auction.
   2) English Reverse No Ties / Dynamic Reverse Auction.

5. DURATION OF AUCTION: The duration of Auction will be for one hour (2.00 PM TO 3.00 PM) .If any Bidder is bidding just before 05 minutes of Auction closing time, the Auction will get extended for another 05 minutes. (THIS SCHEDULE IS TENTATIVE. IN CASE OF CHANGE IN SCHEDULE, THE SAME SHALL BE COMMUNICATED TO YOU)

6. BID DECREMENT: The minimum Bid decrement shall be available to the Bidders at the start of the auction. The bidder can view the same by clicking on the Item details at the start of the auction. The bidder can bid lower than the Lowest Bid in the auction by a decrement equal to the Minimum Bid Decrement or multiple of the Minimum Bid Decrement.

7. VISIBLITY TO BIDDER: The Bidder shall be able to view the following on his screen along with the necessary fields during English Reverse – No ties Auction:

   - Leading Bid in the Auction
   - Bid Placed by him

8. AUCTION WINNER: At the end of the Reverse Auction, BHEL will evaluate all the bids submitted and will decide upon the winner.

9. PROXY BIDS: Proxy bidding feature is a pro-supplier feature to safe guard the supplier's interest of any Internet failure or to avoid last minute rush. The Proxy feature allows Bidders to place an automated bid against other Bidders in an auction and bid without having to enter a new amount each time a competing Bidder submits a new offer. The bid amount that a Bidder enters is the minimum that the Bidder is willing to offer. Here the software bids on behalf of the supplier.
   - The proxy amount is the minimum amount that the Bidder is willing to offer. During the course of bidding, the Bidder cannot delete or change the amount of a Proxy Bid.

- Bids are submitted in decrements (decreasing bid amounts). The application automates proxy bidding by processing proxy bids automatically, according to the decrement that the auction originator originally established when creating the auction, submitting offers to the next bid decrement each time a competing Bidder bids, regardless if competing bids are submitted as proxy or standard bids.
  Manual bid gets precedence over proxy bid in the event both have offered same price and accordingly the vendor who has quoted manually will be shown a hammer symbol and the proxy bidder will have no such symbol.

10. GENERAL TERMS & CONDITIONS: Bidders are required to read the "Terms and Conditions" section of the auctions site (https://auctions.gate2biz.net) using the Login Ids and passwords given to them.

11. OTHER TERMS & CONDITIONS:

- The Bidder shall not involve himself or any of his representatives in Price manipulation of any kind directly or indirectly by communicating with other suppliers / bidders.
- The Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party.
- BHEL's decision on award of Contract shall be final and binding on all the Bidders.
- BHEL along with C1 India can decide to extend, reschedule or cancel any Auction. Any change like "Opening Price", "Minimum Bid Decrement" or other parameters of the Reverse Auction made by BHEL and / or C1 India after the initial hosting on the Auction Engine will have to be unconditionally accepted by the Bidder and continue to participate in the Reverse Auction.
- C1 India shall not have any liability to Bidders for any interruption or delay in access to the site irrespective of the cause.
- C1 India is not responsible for any damages, including damages that result from, but are not limited to negligence. C1 India will not be held responsible for consequential damages, including but not limited to systems problems, inability to use the system, loss of electronic information etc.

N.B.

All the Bidders are required to submit the Agreement Form (Process Compliance Form) duly signed to C1 India Pvt. Ltd. by (AUCTION DATE). After the receipt of the Agreement Form, Log in ID & Password shall be allotted to the Bidders.

BHEL: PSWR: Nagpur

Reverse Auction Procedure (Page 8 of 11)

RA-3
PROCESS COMPLIANCE FORM

(The bidders are required to print this on their company's letter head and sign, stamp before faxing)

To

C1 India Pvt. Ltd.,
D-5, Defence Colony,
New Delhi 110024.

Sub: Agreement to the Process related Terms and Conditions

Dear Sir,

Please refer: Tender Specification No. BHE/PW/PUR/TRT-STG/506 of BHEL PSWR Nagpur

This has reference to the Terms & Conditions for the Reverse Auction mentioned in the Tender document.

This letter is to confirm that:

1) The undersigned is authorized representative of the company.

2) We have studied the Commercial Terms and the Business rules governing the Reverse Auction as mentioned and confirm our agreement to them.

3) We also confirm that we have taken the training on the auction tool and have understood the functionality of the same thoroughly.

4) We also confirm that we will fax the price confirmation

We, hereby confirm that we will honour the Bids placed by us during the auction process.

With regards

Signature with company seal

Name –

Company / Organization –

Designation within Company / Organization –

Address of Company / Organization –

IMPORTANT NOTE:

- Sign this document and Fax at 011- 24655186
- Attach a duly filled in and signed copy of Pages 1 to 7 of this document along with the Agreement Form (Process Compliance Form) and send to C1 India Pvt. Ltd.

RA 4

FINAL PRICE QUOTED DURING REVERSE AUCTION

To
C1 India Pvt Ltd
D 5, Defence Colony
New Delhi – 110024

Sub: Final price quoted during reverse auction.

Please refer: Tender Specification No. BHE/PW/PUR/TRT-STG/506 of BHEL PSWR Nagpur

Dear Sir,

We confirm that we have quoted. Rs---------- as our final price (ie total for all items of Rate Schedule) during the Reverse Auction conducted today.

We also confirm that we are agreeable to BHEL calculating the rates for individual items of Rate Schedule, as defined in Clause No 5 of RA-1.

Thanking you and looking forward to the valuable order from BHEL.

Yours sincerely,

For _____

Name:
Company:
Date:
Seal:

Copy To;
DGM-Purchase, BHEL, PSWR,
Nagpur

RA- 5

OPENING BID AMOUNT IS SAME AS QUOTED IN SEALED PRICE BID

To
Bhart Heavy Electricals Ltd
Shreemohini Complex
345, Kingsway,
NAGPUR-01

Sub: Opening Bid amount is same as quoted in Sealed Price Bid.

Please refer: Tender Specification No. BHE/PW/PUR/TRT-STG/506 of BHEL PSWR Nagpur

Dear Sir,

We confirm that our opening bid amount shall be same as that quoted in sealed price bid (Hard copy of price bid submitted along with our offer).

Thanking you and looking forward to the valuable order from BHEL.

Yours sincerely,

For _____

Name:
Company:
Date:
Seal:

Copy To;
DGM-Purchase, BHEL, PSWR,
Nagpur

RA-6

CONTACT INFORMATION

C1 INDIA PVT. LTD.	BHARAT HEAVY ELECTRICALS LIMITED
AKSHAYA RATH C1 INDIA PVT. LTD. D- 5, DEFENCE COLONY NEW DELHI- 110024 INDIA PHONE: +91-11- 24629600 (EXTN. 207) MOBILE: +91- 09350251043 FAX: +91- 11- 24655186 / 24622773 VIJAY KUMAR - 9844111607 E-MAIL: akshaya.rath@c1india.com	JACOB MATHEW SR.DGM(PUR & FEX), BHEL, PSWR, NAGPUR PHONE :0712- 3048633,3048600 MOBILE : 9422805230 E-MAIL : jmathew@bhelpswr.co.in
MANSI KUMAR C1 INDIA PVT. LTD. D- 5, DEFENCE COLONY NEW DELHI- 110024 INDIA PHONE: +91-11- 24629600 (EXTN. 212) MOBILE:+91-09810006951 FAX: +91- 11- 24655186 / 24622773 E-MAIL: mansi.kumar@c1india.com	G. P. PAL DGM (PUR) BHEL, PSWR, NAGPUR PHONE: 0712 3048641 MOBILE: 9422811151 E-MAIL: gppal@bhelpswr.co.in

SECTION-1

1 GENERAL INSTRUCTIONS TO TENDERER

1.1 DESPATCH INSTRUCTIONS

1.1.1 This tender specification as a whole, duly furnishing all the details required and other documents as required in the following pages shall be duly signed and sent in a sealed cover duly superscribing the name of work as given in the tender notice.

1.1.2 The tender shall be addressed to Officer inviting tender as indicated in the tender notice.

1.1.3 Tenders submitted by post shall be sent as "REGISTERED POST ACKNOWLEDGEMENT DUE" and shall be posted with due allowance for any postal delay. The Tender received after due date and time for opening are liable to be rejected. Telegraphic offers and offers received by telex may not be considered.

1.1.4 Tenders shall be opened by authorised Officer of BHEL at his office at the time and date as specified in the tender notice in the presence of such of those tenderers or their authorised representatives who may be present.

1.1.5 The tenderers shall closely persue all the clauses, specifications and drawing indicated in the tender documents before quoting. Should the tenderers have any doubt about the meaning of any portion of the tender specification or find discrepancies or omission in the drawings or the tender documents issued are incomplete or shall require clarification on any of technical aspect, scope of work etc., he shall at once, contact the authority inviting the tender for clarification before the submission of the tender.

1.1.6 Before tendering, the tenderers are advised to inspect the site of work and environments and be well acquainted with actual working and other prevalent conditions, facilities available, position of material and labour. No claim will be entertained later on the ground of lack of knowledge.

1.1.7 Tenderer must fill up all the schedules and furnish all the required information as per the instructions given in various section of the tender specification. Each and every page of the tender specification must be signed and submitted alongwith the offer by the tenderer in token of complete acceptance thereof. The information furnished shall be complete by itself.

1.1.8 The tenderer shall quote the rates in English language and international numerals. These rates shall be entered in figures as well as in words. In case of difference in rates between words and figures, the least of the two be treated as valid rate. For the purpose of the tenders, the matric system of units shall be used.

1.1.9 All entries in the tender shall be typed or be written in ink. Erasers and overwriting are not permitted and may such tenders liable to summary rejection. All certifications and insertions shall be duly attested by the tenderer.

1.2 QUALIFICATION OF TENDERERS

Only tenderers who have previous experience in the work of this nature and description detailed in this tender specification are expected to quote for this work duly detailing their experience alongwith offer. Offers from tenderers who do not have proven and established experience in the field are not likely to be considered.

1.3 DATA TO BE ENCLOSED

Full information shall be given by the tenderer in respect of the following. Non-submission of this information may lead to rejection of the offer.

1.3.1 FINANCIAL STATUS

A Certificate from Scheduled Bank to prove his financial capacity to undertake the work duly indicating financial limits the tenderer enjoys/Solvency Certificate from the concerned Government authority. Information required in Annexure "A" shall be furnished by the tenderer alongwith the offer.

1.3.2 INCOME TAX CERTIFICATE

A Certificate of Income-tax clearance from the appropriate authority in the forms prescribed therefore duly indicating annual turnover and the Sales Tax clearance certificate from the appropriate authorities as prescribed by the concerned State Governments, if any. These certificates shall be valid for one year from the date of issue or for the period prescribed therein for all tenders submitted during the period.

1.3.3 PREVIOUS EXPERIENCE

A statement giving particulars duly supported by documentary evidence of the various services rendered for each similar works by the tenderer indicating particulars and value of each work, the site location and the duration and date of completion and also a list of site location and particulars and value of various services that are under progress. Information required in Annexure "B" shall be furnished by the tenderers alongwith the offer.

1.3.4 ORGANIZATION CHART

The organization pattern what are totally available with him and will be employed by the tenderer for this work duly indicating the number of Supervisors, the number of Skilled and Unskilled persons etc.

1.3.5 An attested copy of the Power of Attorney, in case the tender is signed by an individual other than the sole proprietor shall also be attached.

1.3.6 IN CASE OF INDIVIDUAL:

His full name, address and place & nature of business.

1.3.7 IN CASE OF PARTNERSHIP FIRM

The names of all the partners and their addresses, A copy of the partnership deed/instrument of partnership dully certified by the Notary Public shall be enclosed.

1.3.8 IN CASE OF COMPANIES:

Date and pla ce of registration including date of commencement certificate in case of Public Companies (certified copies of Memorandum and articles of Association are also to be furnished).

1.3.9 Nature of business carried on by the Company and the provisions of the Memorandum relating thereof.

1.3.10 Names and particulars including address of the Directors and their previous experience.

1.3.11 A list of Tools & Tackles that the tenderer is having and those that will be used on this job.

1.3.12 In addition to the above the particulars required in various annexures.

1.4 EARNEST MONEY DEPOSIT

1.4.1 Every tender must be accompanied by the prescribed amount of Earnest Money Deposit (EMD) in the manner described in Special Conditions of Contract.

1.5 AUTHORISATION AND ATTESTATION

1.5.1 Tenders shall be signed by a person duly authorised/empowered to do so. Certified copies of such authority and relevant documents shall be submitted alongwith tenders.

1.6 VALIDITY OF OFFER

The rates in the Tender shall be kept open for acceptance for a minimum period of SIX MONTHS from the date of opening of tenders. In case BHEL (Bharat Heavy Electricals Ltd) calls for negotiations, such negotiations shall not amount to cancellation or withdrawal of the original offer which shall be binding on the tenderers.

1.7 EXECUTION OF CONTRACT

The successful tenderer's responsibility under this contract commences from the date of issue of the Letter of Intent by Bharat Heavy Electricals Limited. The successful tenderer shall be required to execute an agreement in the prescribed form Annexure-E with BHEL, within a reasonable time after the acceptance of the tender and in any case before submitting the first bill for payment. The expenses for completion and stamping and registration of agreement with prescribed authority, if necessary, shall be borne by the Contractor.

1.8 SECURITY DEPOSIT

1.8.1 Upon acceptance of tender, the successful tenderer shall deposit the required amount of Security Deposit (SD) in the manner specified in the Special Conditions of Contract.

1.8.2 If the value of the work done at any time exceeds the accepted agreement value, the Security Deposit shall be correspondingly enhanced and the extra Security Deposit

shall be immediately deposited by the Contractor or recovered from payments due to him.

1.8.3 Failure to deposit the Security Deposit within the stipulated time may lead to forfeit of Earnest Money and cancellation of the award of work.

1.8.4 BHEL reserves the right to forfeit Security Deposit in addition to other claims and penalties in the event of the contractor's failure to fulfill any of the contractual obligations or in the event of termination of contract as per terms and conditions of contract. BHEL reserves the right to set off these Secu rity Deposit against any claims of any other contracts with BHEL.

1.8.5 RETURN OF SECURITY DEPOSIT

If the contractor fully performs and completes the work in all respect to the entire satisfaction of BHEL, Security Deposit will be released to the contractor after deducting all costs of expenses of other amounts that are to be paid to BHEL under this or other contracts entered into with the contractor on completion/submission of the following:-

a) Release of payment against final bill by BHEL.

b) Clearance Certificate from PF Commissioner, Labour Department, and Railway Authorities etc. wherever applicable.

c) Dismantling of site office, stores, labour colony or any other temporary structures, removal of debris and handing over possession of BHEL/Customer's land without any encumbrance.

d) Performance Bank Guarantee in the prescribed proforma

1.8.9 No interest shall be payable by BHEL on Earnest Money, Security Deposit/or any money due to the contractor by BHEL.

1.9 REJECTION OF TENDER AND OTHER CONDITIONS

1.9.1 The acceptance of tender will rest with BHEL which does not bind itself to accept the lowest tender or any tender and reserves to itself full rights for the following without assigning any reasons whatsoever:-

1.9.1.1 To reject any or all of the tenders.

1.9.1.2 To split up the work amongst two or more tenderers.

1.9.1.3 To award the work in part

1.9.1.4 Either of the contingencies stated in (1.9.1.2) and (1.9.1.3) above to modify the time for completion suitably.

1.9.2 Conditional and Unwitnessed tenders, tenders containing absurd unworkable rates and tenders which are incomplete and otherwise defective and tenders not in accordance with the tender conditions, specifications etc. are liable to be rejected.

1.9.3 If a tenderer expired after the submission of his tender or after the acceptance of his tender, BHEL may at their discretion, cancel such tender. If a partner of a firm

expires after the submission of tender or after the acceptance of the tender, BHEL may then cancel such tender at their discretion, unless the firm retains its character.

1.9.4 BHEL will not be bound by any Power of Attorney granted by changes in the composition of the firm made subsequent to the execution of the contract. They may, however, recognise such power of Attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the contractor concerned.

1.9.5 If the tenderer deliberately gives wrong information in his tender, BHEL reserves the right to reject such tender at any stage or to cancel the contract if awarded and forfeit the Earnest Money/Security Deposit/any other money due.

1.9.6 Canvassing in any form in connection with the tenders submitted by the Contractors is liable to rejection.

1.9.7 Should a tenderer or contractor or in the case of a firm or company of contractor/one or more of its partners/shareholders/Directors have a relation or relatives employed in BHEL, the authority inviting tender shall be informed of the fact alongwith the offer. Failing to do so, BHEL may, at its sole discretion, reject the tender or cancel the contract and forfeit the Earnest Money/Security Deposit.

1.9.8 The successful tenderer should not sub-contract the part of complete work detailed in the tender specification undertaken by him without written permission of BHEL. The tenderer is solely responsible to BHEL for the work awarded to him.

SECTION-2

2.1 DEFINITION: The following terms shall have the meaning hereby assigned to them except where the context otherwise required.

2.1.1 BHEL shall mean Bharat Heavy Electricals Limited, a company registered under Indian Companies Act, 1956 with its registered office at BHEL HOUSE, SIRI FORT, NEW DELHI, or its authorised officers or its Resident Engineers or other employees authorised to deal with any matters with which these persons are concerned on its behalf.

2.1.2 "GENERAL MANAGER" shall mean the Officer in Administrative charge of contracting unit of BHEL.

2.1.3 "ENGINEER" or "ENGINEER IN CHARGE" shall mean ENGINEER deputed by BHEL. The term includes DGM, PROJECT MANAGER, CONSTRUCTION MANAGER, RESIDENT MANAGER, SITE ENGINEER, RESIDENT ENGINEER and ASSISTANT SITE ENGINEER of BHEL at site as well as the Officers in charge at Head Office.

2.1.4 "SITE" shall mean theplaces or place at which the plants/equipments are to be erected and services are to be performed as per the specification of this contract.

2.1.5 "CLIENT OF BHEL" or "CUSTOMER" shall mean the project authorities with whom BHEL has entered into a contract for provision of services.

2.1.6 "CONTRACTOR" shall mean the individual firm or company who enters into the contract with BHEL and shall include their executors, administrators and successors and permitted assigns.

2.1.7 "CONTRACT" or "CONTRACT DOCUMENT" shall mean and include the agreement of work order, the acceptance, appendices or rates, schedules, quantities if any, general conditions of contract, special conditions of contract, instructions to the tenderer, drawings, technical specifications, the specifications if any the tender documents and the Letter of Indent/Accepting letter issued by BHEL. Any conditions or terms stipulated by the contractor in the tender documents or subsequent letters shall not form part of the contract unless, specifically accepted in writing by BHEL in the Letter of Indent and incorporated in the agreement.

2.1.8 "GENERAL AND SPECIAL CONDITIONS OF CONTRACT" shall mean the instructions to Tenderer and General and special conditions of contract pertaining to the work for which above tenders have been called for.

2.1.9 "TENDER SPECIFICATION" shall mean "Specific conditions, technical specifications, appendices, site information and drawing pertaining to the work in which the tenderers are required to submit their offer. Individual specification number will be assigned to each tender specification.

2.1.10 "TENDER DOCUMENTS" shall mean the General and special conditions of contract (2.1.8) and tender specification (2.1.9).

2.1.11 "LETTER OF INTENT" shall mean the intimation by a letter to the tenderer that the tender has been accepted in accordance with provisions contained in the letter. The responsibility of the contractor commences from the date of issue of this letter and all terms and conditions of the contract are applicable from this date.

2.1.12 "COMPLETION TIME" shall mean the period by date specified in the acceptance of tender for handing over the erected equipment/plant which are found acceptable by the Engineer being of required standard and conforming to the specifications of the contract.

2.1.13 "PLANT" shall mean and connote the entire assembly of the plant and equipments covered by the contract.

2.1.14 "EQUIPMENT" shall mean equipment, machineries, materials, structural, electricals and other components of the plant covered by the contract.

2.1.15 "TESTS" shall mean and include such test or tests to be carried out on the part of the contractor as are prescribed in the contract or considered necessary by BHEL, in order to ascertain the quality, workmanship, performance and efficiency of the contractor or part there of.

2.1.16 "APPROVED", "DIRECTED" or "INSTRUCTED" shall mean approved, directed or instructed by BHEL.

2.1.17 "WORK OR CONTRACT" shall mean and include supply of all categories of labours, specified consumables, tools and tackles required for complete and satisfactory site, transportation, handling, stacking, storing, erecting, testing and commissioning of the equipments to the entire satisfaction of BHEL.

2.1.18 "SINGULAR AND PLURALS ETC" words carrying singular number shall also include plural and vice versa, where the context so required, Words, imparting the masculine Gender shall be taken to include the feminine Gender and words imparting persons shall include any company or associations or body of individuals, wherever incorporated or not.

2.1.19 "HEADING" – The heading in these general conditions are solely for the purpose of facilitating reference and shall not be deemed to be part thereof or be taken as instructions thereof or of the contract.

2.1.20 "MONTH" shall mean calendar month.

2.1.21 "COMMISSIONING" shall mean the synchronisation of the Plant after all initial adjustments, trials, cleaning, re-assembly required at site if any, have been completed and plant is ready for commercial use.

2.1.22 "WRITING" shall include any manuscript type written or printed statement under the signature of BHEL.

2.2 LAW GOVERNING THE CONTRACT AND COURT JURISDICTION

The contract shall be governed by the Law for the time being in force in the Republic of India. The Civil Court at NAGPUR having ordinary original civil jurisdiction shall alone have exclusive jurisdiction in regard to all claims in respect of this contract.

2.3 ISSUE OF NOTICE

The Contractor shall fumish to BHEL Engineer the name, designation and address of his authorised agent and all complaints, notices, communication and reference shall be deemed to have been duly given to the contractor if delivered to the contractor or his authorised agent or left at or posted to the address either of the contractor or his representative and shall be deemed to have been so given in the case of posting on the day on which they would have reached such address in the ordinary course of the post or on which they were so delivered of or left.

2.4 USE OF LAND

No land belonging to BHEL or their customer under temporary possession of BHEL shall be occupied by the contractor without written permission of BHEL.

2.5 COMMENCEMENT OF WORK

2.5.1 The contractor shall commence the work within the time indicated in the Letter of Indent from BHEL and shall proceed with the same with due expedition without delay.

2.5.2 If the successful tenderer fails to start the work within stipulated time, BHEL, at its sole discretion will have the right to cancel the contract. The Earnest Money and/or Security Deposit with BHEL will stand forfeited without any further reference to him without prejudice to any and all of BHEL's other rights and remedies in this regard.

2.5.3 All the work shall be carried out under the direction and to the satisfaction of BHEL.

2.5.4 The transported equipment, erected/constructed plan of work performed under the contract as the case may be shall be taken over when it has been completed in all respects and/or satisfactorily put into operation site.

2.6 MODE OF PAYMENT AND MEASUREMENT OF THE WORK COMPLETED:

2.6.1 All payments due to the contractor shall be paid by "Account Payee Cheques"

2.6.2 For progress running bill payments: - The Contractor shall present detailed measurement sheets in triplicate, duly indicating all relevant details based on technical documents and connected drawings for work done during the month/period under various categories in line with terms of payment as per Letter of Indent. The basis of arriving at the quantities, weights shall be relevant documents and drawings released by BHEL. The measurement sheets shall be prepared jointly with BHEL Engineers and signed by both the parties.

2.6.3 These measurement sheets will be checked by BHEL Engineers and quantities and percentage eligible for payment under various groups shall be decided by BHEL Engineer. The abstract of quantities and percentage so arrived at based on the terms of payment shall be entered in Measurement Book and signed by both the parties.

2.6.4 Based on the above quantity, contractor shall prepare the bills in prescribed proforma and work out the financial value. These will be entered in Measurement Book and signed by both the parties and paid for duly effecting recoveries due.

2.6.5 All recoveries due from the contractor for the month/period shall be effected in full from the corresponding running bills unless specific approval from the competent authorities is obtained otherwise.

2.6.6 Measurement shall be restricted to that for which it is required to ascertain the financial liability of BHEL under this contract.

2.6.7 The measurement shall be taken jointly by person duly authorised on the part of BHEL and by the Contractor.

2.6.8 The Contractor shall bear the expenditure involved if any, in making the measurement. The contractor shall, without extra charges, provide all the assistance with appliances and other things necessary for measurement.

2.6.9 If at any time due to any reason whatsoever, it becomes necessary to re-measure the work done in full or in part, the expenses towards such reimbursements shall be borne by the contractor.

2.6.10 Passing of measurement as per bills does not amount to acceptance of the completion of the work mentioned. Any left out work has to be completed, if pointed out at a later date by BHEL.

2.6.11 Final measurement bill shall be prepared in the final bill proforma prescribed for the purpose based on the certificate issued by BHEL Engineer that entire works as stipulated in tender specification has been completed in all respects to the entire satisfaction of BHEL. Contractor shall give unqualified "No Dues" and "No Demand" Certificate. All the tools and tackles loaned to him should be returned in satisfactory condition to BHEL. Quantities/weight erected shall be prepared and paid within a reasonable time after completion of work. After payment of final bill only guarantee obligation percentage shall remain unpaid which shall be released in accordance with clause 2.13 The final bill quantities and financial value shall also be entered in Measurement Book and signed by both the parties to the contract.

2.7 RIGHTS OF BHEL

BHEL reserves the following rights in respect of this contract without entitling the contractor for any compensation.

2.7.1 To get work done through other agency at the risk and cost of the contractor in the event of contractor's poor progress, other or inability to progress the work for completion as stipulated in the contract, poor quality of the work, persistent disregard to instruction of BHEL, assignment, transfer, subletting of the contract without permission of BHEL, non-fulfillment of any contractual obligation etc. and to claim/recover compensation for such losses from the contractor including BHEL's supervision charges and overheads from Security Deposit and other dues.

2.7.2 To withdraw any portion of work and/or to restrict after quantum of work as indicated in the contract during the progress of erection and get it done through other agency and/or by departmental labour to suit BHEL's commitment of its customer or in case BHEL decided to advance the date of completion due to other emergency reasons BHEL's obligation to its customer.

2.7.3 To terminate the contract after due notice and forfeit security deposit and recover the loss sustained in getting the balance work done through other agencies in addition to liquidated damages in the event of:-

2.7.3.1 Contractor's continued poor progress

2.7.3.2 Withdrawal from or abandonment of the work before completion of the work

2.7.3.3 Corrupt act of contractor

2.7.3.4 Insolvency of the contractor

2.7.3.5 Persistent disregard to the instructions of BHEL

2.7.3.6 Assignment, transfer, sub-letting of contract without BHEL's written permission

2.7.3.7 Non fulfillment of any contractual obligations

2.7.4 To recover any money due from contractor from any money due to the contractor under this contract or any contract or from the security deposit.

2.7.5 To claim compensation for losses sustained including BHEL's supervision charges and overheads for completion on termination of contract and to impose penalty for delay in completion of the work at the rate of ½% of the contract value per week of delay or part thereof subject to ceiling of 10% of contract value.

2.7.6 To terminate the contract or to restrict the quantum of work and pay for the portion of work executed in case BHEL's contract with their customer are terminated for any reason.

2.7.7 To effect recovery from any amounts due to the contractor under this or any other contract or in any other form the money BHEL is forced to pay to anybody due to contractor's failure to fulfill any of his obligations.

2.7.8 To restrict or increase the quantity and nature of work to suit site requirement since the tender specification is based on preliminary documents and quantities furnished therein are indicative and approximate and the rates quoted shall not be subject to revision.

2.7.9 To deploy BHEL's Fitters, Welders, Operators and Technicians in case of emergency/poor progress/efficiency in skill on the part of employees of contractor and recover the expenditure on account of the same from contractor's bills.

2.7.10 While every endeavour will be made by BHEL, they can not guarantee uninterrupted work due to conditions beyond their control, contractor will not be entitled for any compensation/extra payment on this account.

2.7.11 In the event of any dispute of any nature, the decision of BHEL shall be final and binding on the contractor.

2.8 RESPONSIBILITIES OF THE CONTRACTOR IN RESPECT OF LOCAL LAWS, EMPLOYMENT OF WORKERS ETC.

The following are the responsibilities of the contract in respect of observation of local laws, employment of personnel, payment of taxes etc.

2.8.1 As far as possible, Unskilled Workers shall be engaged from the local areas in which the work is being executed.

2.8.2 The contractor at all times during the continuance of this contract shall, in all his dealings with local labour for the time being employed on or in connection with the work, have due regard to all local festivals and religious and other customs.

2.8.3 The contractor shall comply with all State and Central Laws, Statutory Rules, Regulations etc. such as:-

2.8.4 Payment of Wages Act, Minimum Wages Act, Workmen Compensation Act, Employer's Liability Act, Industrial Dispute Act, Employers Provident Fund Scheme, Employees State Insurance Scheme, Contract Labour (Regulation and Abolition) Act, 1970 and other acts, rules and regulations for labour as may be enacted by the Government during the tenure of the contractor shall give to the local governing body, police and other relevant authorities all such notices as may be required by the Law.

2.8.4 The contractor shall pay all taxes, license charges, deposits, duties, taxes, royalties, commission or other charges which may be levied 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.

2.8.5 While BHEL would pay the inspection fees of Boiler Inspectorate, all other arrangements for site visits periodically by Boiler Inspector to site, Inspection certificate etc. will have to be made by contractor. However, BHEL will not make any payment to Boiler Inspector in connection with contractor's Welders qualification/prequalification tests. Etc.

2.8.6 Contractor shall be responsible for provision of health and sanitary arrangements (more particularly described in Contract Labour Regulation & Abolition Act), Safety precautions etc. as may be required for safe and satisfactory execution of contract.

2.8.7 The contractor shall be responsible for proper accomodation including adequate medical facilities for personnel employed by him.

2.8.8 The contractor shall be responsible for the proper behaviour and observance of all regulations by the staff employed by him.

2.8.9 The contractor shall ensure that no damage is caused to any person/property of other parties working at site. If any such damage is caused, it is responsibility of the contractor to make good the losses or compensate for the same.

2.8.10 All the properties/equipments/components of BHEL/their Client loaned with or without deposit to the contractor in connection with the contract shall remain properties of BHEL/their Client.

The contractor shall use each property for the purpose of execution of this contract. All such properties/equipments/components shall be deemed to be in good condition when received by the contractor unless he notifies within 48 hours to the contrary. The contractor shall return them in good condition as and when required.

2.8.11 It is not obligatory on the part of BHEL to supply any tools or tackles or other materials other than those specifically agreed to do so by BHEL. However, depending upon availability/possibility/BHEL's/ Customer's handling equipment and other plants may be made available to the contractor on payment of the hire charges free of charges as fixed, subject to the conditions laid down by

BHEL/Customer from time to time unless paid in advance, such hire charges if applicable shall be recovered from contractor's bills/Security Deposit in one installment.

2.8.12 The contractor shall fully indemnify BHEL against all claims of whatsoever nature arising during the course of erection/construction/performing work under the contract.

2.8.13 In case the contractor is required to undertake any work outside the scope of this contract, the rates payable shall be those mutually agreed upon.

2.8.14 Any delay in completion of works/or non achievement of periodical targets due to the reasons attributable to the contractor, the same will have to be compensated by the contractor either by increasing manpower and resources or by working extra hours and/or by working more than shift. All these are to be carried out by the contractor at no extra cost.

2.8.15 The contractor shall arrange, coordinate his work in such a manner as to cause no hindrance to other agencies working in the same premises.

2.8.16 All safety rules and codes applied by the Client/BHEL at site shall be observed by the contractor without exception. The contractor shall be responsible for the safety of the equipment/material and works to be performed by him and shall maintain all light, fencing guards, slings etc. or other protection necessary for the purpose. Contractor shall also take such additional precautions as may be indicated from time to time by the Engineer with a view to prevent pilferage, accidents, fire hazards and due precautions shall be taken against fire hazards and atmospheric conditions. Suitable number of Clerical staff, watch and ward, store keepers to take care of equipment/materials and construction tools and tackles shall be posted at site by the contractor till the completion of work under this contract.

The contractor shall arrange for such safety devices as are necessary for such type of work and carry out the requisite site tests of handling equipment, lifting tools, tackles etc. as per prescribed standards and practices.

2.8.17 The contractor will be directly responsible for payment of wages to his workmen. A pay roll sheet giving all the payments given to the workers and duly signed by the contractor's re presentative should be furnished to BHEL site for record purpose, if so called for.

2.8.18 In case of any class of work for which there is no such specification as laid down in the contract, such work shall be carried out in accordance with the instructions and requirements of the Engineer.

2.8.19 No levy or payment or charge made or imposed shall be impeached by reason of any Clerical error or by reason of any mistake in the amount levied or demanded or charged by BHEL/their Client. In case of nonreturning, loss, damage, repair etc. the cost thereof as may be fixed by the Site Engineer will be recovered from the contractor.

2.8.20 Also, no idle labour charges will be admissible in the event of any stoppage caused in the work resulting contractor's labour being rendered idle due to any cause at any time.

2.8.21 The contractor shall take all responsible care to protect the materials and work till such time the plant/equipment has been taken over by BHEL/their Client.

2.8.22 The contractor shall not stop the work or abandon the site for whatsoever reason of dispute, excepting force majeure conditions. All such problems/disputes shall be separately discussed and settled without affecting the progress of work. Such stoppage or abandonment shall be treated as breach of contract and deal with accordingly.

2.9 CONSEQUENCES OF CANCELLATION

Whenever BHEL exercises its authority to terminate the contract/withdraws a portion of work under 2.7, they may complete the work by any means at the contractor's risk and cost, provided that the event of the cost of completion(as certified by the Site Engineer which is final and conclusive) be less than contract cost, the advantage shall accrue to BHEL and that if the cost of completion exceeds the money due to contractor under the contract, the contractor shall either pay the excess amount ordered by BHEL or same shall be recovered from the contractor by any other means. This will be in addition to the forfeiture of security deposit and recovery of liquidated damages as per relevant clauses.

2.9.1 In case BHEL completes the work under the provision of this condition, the cost of such completion to be taken into account in determining the excess cost to be charged to the contractor under this condition shall consist of materials purchased and/or labour provided by BHEL within addition of such percentage to COVER SUPERVISION and establishment charges as may be decided by BHEL.

2.10 INSURANCE

2.10.1 BHEL/their customer shall arrange for insuring the materials/properties of BHEL/Customer covering the risk during transit, storage, erection and commissioning.

2.10.2 It is the sole responsibility of contractor to insure his workmen against accidents and injury while at work as required by relevant rules and to pay compensation to workmen as per Workmen's Compensation Act. Contractor shall insure his staff against accidents. The work will be carried out in a protected area and all the rules and regulations of the client/BHEL in the area of project which are in force from time to time will have to be followed by the contractor.

2.10.3 If due to negligence and for non observation/observance of safety and other precautions, any accident/injury occurs to any other persons/public, the contractor shall have to pay necessary compensation and other expenses, if so decided by the appropriate authorities.

2.10.4 If due to the contractor's carelessness, negligence or non-observance of safety precaution, damage to BHEL's/Customer's property and personnel occurs and if BHEL is unable to recover in full cost from the insurance company, the same will be recovered from contractor.

2.10.5 It shall be the responsibility of contractor to provide security arrangement for the equipment/materials belonging to BHEL and handed over to contractor for erection/transportation till same are taken over by BHEL.

2.11 STRIKES & LOCKOUT

2.11.1 The contractor will be fully responsible for all the dispute and other issues connected with his labour. In the event of the contractor's labour resorting to strike or the

Contractor resorting to lockout and if the strike or lockout declared is not settled within a period of one month, BHEL shall have the right to get the erection work executed employing its own labour or through any other agencies or both and the cost so incurred by BHEL shall be deducted from the contractor'' bills.

2.11.2 For all purposes whatsoever, the employees of the contractor shall not be deemed to be in the employment of BHEL.

2.12 FORCE MAJEURE

2.12.1 The following shall amount to force majeure:-

Acts of God, act of any Government, War, Sabotage, Riots, Civil commotion, Police action, Revolution, Flood, Fire, Cyclones, Earth quake and Epidemic and other similar causes over which the contractor has to control.

2.12.2 If the contractor suffers delay in the due execution of the contractual obligation due to delays caused by force majeure as defined above, the agreed time of completion of the job covered by this contract or the obligations of the contractor shall be extended by a period of time equal to period of delay, provided that on the occurrence of any such contingency, the contractor immediately should report to BHEL and the contractor shall not be eligible for any compensation.

2.13 GUARANTEE

Even though the work will be carried out under the supervision of BHEL Engineers, the contractor will be responsible for the quality of the workmanship and shall guarantee the work done for a period of twelve months from the date of completion of work as certified by the Engineer for good workmanship and shall rectify free of cost all such defects due to faulty erection detected during the guarantee period starting from the date of the completion of rectification. In the event of the contractor failing to repair the defective works within the time specified by the Engineer, BHEL may proceed to undertake the repairs of such defective works at the contractor's risk and cost without prejudice to any other rights and recover the same from security deposit/other dues or by other legal means.

2.14 ARBITRATION

All disputes between the parties to the contract, arising out of or in relation to the contract other than those for which the decision of the Engineer or of any other person is by the contract expressed to be final and conclusive shall, after written notice by either party to the contract to other party be referred to sole arbitration of General Manager or his nominee. The arbitration shall be conducted in accordance with the provisions of the Indian Arbitration Act 1940.

The parties to the contract understand and agree that it will be no objection that the General Manager or the person nominated as Arbitrator, had earlier in his official capacity to deal directly or indirectly with the matter to which the contract relates or that in the course of his official duties had expressed views on all or any of the matters in dispute or difference. The award of the Arbitrator shall be final and binding on the parties to this contract.

In the event of the Arbitrator dying, neglecting or refusing to act, resigning or being unable to act for any reason or his award being set aside by the Court for any reason. It shall be lawful for the General Manager or his successor as the case may be, either to act himself as the Arbitrator or to appoint another Arbitrator in the place

of the outgoing Arbitrator in the manner aforesaid. The Arbitrator may from time to time, with the consent of both the parties to the contract, enlarge the time for making the award.

2.15 Work under the contract shall be continued during the arbitration proceedings. The venue of the arbitration shall be the place from which the contract is issued or such other place as the Arbitrator at his discretion may determine.

2.16 PRICE VARIATION CLAUSE

The quoted rate shall be firm throughout the period as specified in time schedule plus grace period. The grace period would be one month for every six months of contract period or part thereof. In case the work cannot be completed within the above period plus grace period for no fault of contractor, the following shall become applicable to cover all expenditure for completing the contracted work. No other compensation shall be payable:-

$$P_1 = P_0 (0.10 + 0.90 L_1 / L_0)$$

Where

P_1 = Revised contract rate/Contract price

P_0 = Accepted contract rate/contract price

L_0 = All India Average Consumer Price Index for Industrial Workers as published in RBI Bulletin for the month when the contract period comes to a close.

L_1 = All India average Consume r Price Index for Industrial Workers as published in RBI Bulletin for the month for which bill has been raised.

ANNEXURE"A"

FINANCIAL VIABILITY

1	Owner's capital in the business (in case of Partnership, Please mention percentage, shares and amounts)	Rs.	
2	Quantum of Business done during last three financial years		Rs.
		1)	
		2)	
		3)	
3.	Value of fixed assets of the business in last three years	1)	
		2)	
		3)	

4. Guarantee Limits(if any) enjoyed by the firm

5. Over draft limits (if any) enjoyed by the firm

6. Please state whether audited Profit and Loss Account and Balance Sheet for last three years are enclosed.

NOTE: All the above documents should be duly certified by Auditors/Bank as may be applicable.

ANNEXURE"B"

ANALYSIS OF SIMILAR JOBS EXECUTED/IN PROGRESS

Sl. No.	Details of job executed/in progress with location of projects	Total value of the contract	No. of Skilled/Unskilled workers deployed at site for this job	No. of staff deployed at site for execution of job	Remarks

ANNEXURE"C"

PROFORMA FOR BANK GUARANTEE FOR EARNEST MONEY DEPOSIT
(IF APPLICABLE)
(To be issued in appropriate valid non-judicial stamp paper)

This deed of guarantee made this_____ day of 200 by _____ Bank Limited in favour of Bharat Heavy Electricals Limited, having its registered office at BHEL House, Asian Games Village, Siri Fort, New Delhi – 110 049 (hereinafter called the "Company"), thru BHEL, Power Sector-Western Region, Nagpur – 440 001 (Maharashtra).

WHEREAS M/s _____ (hereinafter called the tenderer) have submitted a tender_____in response to tender specification no._____ (hereinafter called the said "tender document") of M/s BHEL, PSWR, Nagpur – 440 001.

AND WHEREAS the said tender documents provide that the tenderer shall pay a sum of Rs._____(Rupees _____only) towards Earnest Money Deposit to be made in the form and manner therein specified.

AND WHEREAS the tenderer _____have approached in consideration of the arrangement arrived at between the said tenderer and the said Bank and the said Bank has agreed to give such guarantee as hereunder mentioned to the aforesaid company.

Now, therefore, this presents witness that we _____ Bank Limited by the hand of Shri_____, its lawfully and duly constituted attorney, do hereby undertake to pay the aforesaid company a sum of Rs._____(Rupees _____only) by virtue of the Guarantee against any loss or damage caused to or suffered by the said company by reason of any breach by the aforesaid tenderer of the terms, conditions, stipulations, Undertaking or any one of them contained in the said tender documents and for the payment of any money or moneys payable by the said tenderer to the said company under the terms and conditions of the tender documents (the decision regarding the breach, loss, damage or payment due being solely is the discretion of the said company). We further undertake to pay the aforesaid amount in a lumpsum on demand irrespective of the fact whether the said tenderer admits or denies such claims or questions its correctness in any Court, Tribunal or Arbitration proceedings or before any authority.

The aforesaid guarantee will remain in force and we shall be liable under the same irrespective of any concession for the time being granted by the said company to the tenderer in or for fulfilling conditions of the tender documents and the guarantee will remain in full force irrespective of any change of terms, conditions or stipulations or any variation in the terms of the said tender documents irrespective of whether notice of such change and variation is given to us or not and claim to receive such notice of any change and/or variation of the terms and/or conditions of the said tender document is hereby specifically waived by us. Further, we shall not be released from the guarantee by any for bearance of exercise of non exercise of any of the power of rights under the said company against the tenderer irrespective of whether notice of such for bearances, enforcement or non-enforcement of any powers or rights modifications or changes of such for bearances enforcement or non-enforcement of any powers or right, modifications or changes made in the said tender documents or concessions shown of the tenderer by the company is given to us or not. The guarantee herein contained shall be determined or affected by the liquidation or winding up or insolvency or change in the constitution of the tender but shall in all respects and for all purposes be binding and operative until all payments of all moneys due or that may hereafter become due to the said company in respect of any liability or obligations of the tender under the said tender documents.

We, the said Bank further agree that the guarantee hereinafter contained shall remain in full force and effect during the period that would be taken for the finalisation of the tender and execution of agreement there of and that it shall continue to be enforceable till the required security deposit is deposited by the successful tenderer, as stipulated in the said tender documents or till the company certifies that the terms and conditions of the said tender documents have been fully and properly carried out by the said tenderer, and accordingly discharged the guarantee subject however to that the company shall have no rights under this guarantee after the expiry of 180 days from the date of its execution.

Any claim of dispute arising under the terms of these documents shall only be enforced or settled in Courts at NAGPUR only.

And lastly the _____ Bank undertakes not to revoke this guarantee under the Bank's memorandum and articles of association and the undersigned has full power to do so on its behalf under the power of attorney dated _____ granted to him by the proper authorities of the Bank.

DATED THE DAY OF

Bank by its constituted attorney

(Signature of the person duly authorised to sign on behalf of Bank)

Note: 1) To be countersigned by the SBI or RBI if it is executed by other Scheduled Banks.

2) No deviation from the above can be accepted.

ANNEXURE "D"

PROFORMA FOR SECURITY DEPOSIT BG

THIS DEED OF GUARANTEE made this day of_____
By M/s_____
(Hereinafter called the Bank) in favour of M/s Bharat Heavy Electricals Limited, having its registered office at BHEL House, Asian Games Village, Siri Fort, New Delhi – 110 049 (hereinafter called the "Principal"), thru BHEL, Power Sector-Western Region, Nagpur – 440 001 (Maharashtra).

WHEREAS M/s_____
(Hereinafter called the contractor) proposes to enter into a contract arising out of Letter of Indent No. _____ dated _____ addressed by principal to the contractor for_____(hereinafter called the said agreement).

AND WHEREAS the said agreement provides that the contractor shall pay a sum of Rs. _____ (Rupees _____only) towards 50% of full Security Deposit to be made in the form and manner therein specified.

AND WHEREAS the Contractor have approached the Bank and their request and in consideration of the agreement arrived at between the said Contractor and the Bank, the Bank has agreed to give such guarantee as hereinafter mentioned to the Principal.

NOW, therefore these presents witnesses that we the Bank by the hand of Mr._____, its lawfully duly constituted attorney to hereby undertake to pay to the Principal a sum of Rs. _____ (Rupees _____ only) without demur on demand being made by the Principal and keep to the Principal indemnified to the extent of Rs._____ by virtue of this guarantee against any loss or damage caused to or by the aforesaid Contractor of any of the terms and conditions, stipulation or undertaking of any one of them contained in the said Agreement and tender documents attached thereto, and for the payment of any money or money payable by the said contractor to the Principal under the terms and conditions of the said Agreement (the decision regarding the breach, loss, damage or payment due being solely in the discretion of the Principal).

We further undertake to pay without demur the aforesaid amount in a lump sum on demand or such part there of as the Principal may demand from time to time irrespective of the fact whether the said contractor admits or denies such claim or questions its correctness in any Court, Tribunal or Arbitration proceedings or before any authority. The aforesaid guarantee will remain in force and we shall be liable under the same irrespective of any concession or time being granted by the Principal to the contractor in or for fulfilling the said agreement between contractor and the Principal and the guarantee will remain in full force irrespective of any change of terms, conditions or stipulations or any variation in the terms of the said Agreement irrespective of whether notice of such change or variation is given to us or not.

The Guarantee herein contained shall not be determined or affected by the liquidation or winding up or insolvency of or change in the constitution of the Contractor but shall in all respects and for all purposes binding and operative until all payments of all money due or that may hereafter become due to the principal in respect of any liabilities or obligations of the contractor under the said agreement.

We, the Bank further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said

agreement and that it shall continue to be enforceable till all dues of the principal under or by virtue of the said agreement have been fully paid its Agreement have been fully and properly carried out by the said contractor and accordingly discharges the guarantee, subject however that the principal shall have no rights under the guarantee after the expiry of six months from the date of completion of the contract unless this guarantee is extended by mutual agreement.

Any claim or dispute or disputes arising under the terms of this document shall be enforced or settled in the Courts at Nagpur only.

And lastly the bank undertakes not to revoke this guarantee during its currency except with the previous consent of the principal in writing.

The Bank hereby declares that it has powers to issue this guarantee under the Bank's Memorandum and Articles or Association and undersigned has full powers to do so on its behalf under the power of attorney to him by the proper authorities of the Bank.

DATED:

(Name of the Bank)

SEAL

DESIGNATION OF THE AUTHORISED
PERSON SIGNING THE GUARANTEE

ANNEXURE "E"

PROFORMA FOR ADVANCE PAYMENT (If Applicable)

THIS DEED OF GUARANTEE made this day of_____ by M/s_____(hereinafter called the Bank) in favour of M/s Bharat Heavy Electricals Limited, having its registered office at BHEL House, Asian Games Village, Siri Fort, New Delhi – 110 049 (hereinafter called the "Principal"), thru BHEL, Power Sector-Western Region, Nagpur – 440 001 (Maharashtra).

WHEREAS M/s_____(hereinafter called the contractor) proposes to enter into a contract arising out of Letter of Award reference no. _____ dated _____ addressed by Principal to the Contractor for _____(hereinafter called the said agreement).

AND WHEREAS the said Agreement provides that the Principal shall pay a sum of up to Rs. _____ (Rupees _____ only) being the 5% value of the Contract amount of Rs. _____ towards interest bearing advance to be made in the form and manner therein specified.

AND WHEREAS the Contractor have approached the Bank requesting to issue a Bank Guarantee for Rs. _____ and based on their request and in consideration of the agreement arrived at between the said Contractor and the Bank, the Bank has agreed to give such bank guarantee as hereinafter mentioned to the Principal.

NOW, therefore, these presents witnesses that we the Bank by the hand of Mr._____, its lawfully duly constituted attorney do hereby undertake to pay to the principal a sum of Rs. _____ (Rupees _____only) without demur on demand being made by the principal and keep to the Principal indemnified to the extent of Rs._____ by virtue of this guarantee against any loss or damage caused to or by the aforesaid Contractor of any of the terms or conditions, stipulation or undertaking of any one of them contained in the said agreement and tender documents attached thereto, and for the payment of any money or moneys payable by the said Contractor to the Principal under the terms and conditions of the said agreement (the decision regarding the breach, loss, damage or payment due being solely in the discretion of the principal).

We further undertake to pay without demur the aforesaid amount in a lump sum on demand or such part thereof as the principal may demand from time to time irrespective of the fact whether the said contractor admits or denies such claim or questions its correctness in any Court, Tribunal or Arbitration proceedings or before any authority. The aforesaid guarantee will remain in force and we shall be liable under the same irrespective of any concession or time being granted by the Principal to the Contractor in or for fulfilling the said agreement between contractor and the principal and the guarantee will remain in full force irrespective of any change of terms, conditions or stipulations or any variation in the terms of the said agreement irrespective of whether notice of such change or variation is given to us or not.

The Guarantee herein contained shall not be determined or affected by the liquidation or winding up or insolvency or change in the constitution of the contractor, but shall in all respects and for all purposes binding and operative until all payments of all money due or that may hereafter become due to the principal in respect of any liabilities or obligations of the contractor under the said agreement.

We, the Bank further agree that the guarantee herein contained shall remain in full force till the advance and interests thereof are recovered in full.

Any claim or dispute or disputes arising under the terms of this document shall be enforced or settled in the Courts at Nagpur only.

And lastly the Bank undertakes not to revoke this guarantee during its currency except with the previous consent of the principal in writing.

The Bank hereby declares that it has powers to issue this guarantee under the Bank's Memorandum and Articles of Association and undersigned has full powers to do so on its behalf under the Power of Attorney granted to him by the proper authorities of the Bank.

DATED

(Name of the Bank & Place)

SEAL

DESIGNATION OF THE AUTHORISED
PERSON SIGNING THE GUARANTEE

ANNEXURE"F"

BANK GUARANTEE PROFORMA FOR RELEASE OF LAST 5% PAYMENT

THIS DEED OF GUARANTEE made this day of_____ by M/s_____(hereinafter called the Bank) in favour of M/s BHARAT HEAVY ELECTRICALS LIMITED, having its registered office at BHEL House, Asian Games Village, Siri Fort, New Delhi – 110 049 (hereinafter called the "Principal"), thru BHEL, Power Sector-Western Region, Nagpur –440-001(Maharashtra), WHEREAS

M/s_____(hereinafter called the contractor) proposes to enter into a contract arising out of Letter of Award reference no. _____ dated _____ addressed by the Principal to the contractor for (hereinafter called the said agreement).

AND WHEREAS the said agreement provides that the contractor shall pay a sum of Rs. _____ (Rupees) _____ only) towards 5 percent of contract value towards guarantee period of twelve months in the form and manner therein specified.

AND WHEREAS the contractor have approached the Bank and their request and in consideration of the agreement arrived at between the said contractor and the Bank, the Bank has agreed to give such guarantee as hereinafter mentioned the Principal.

NOW therefore, these presents witness that we the Bank by the hand of Mr._____ the offices are authority by the bank of Guarantees' issue in behalf of the Bank do hereby undertakes to pay to the principal a sum of Rs_____(Rupees_____only) by virtue of this guarantee against any loss or damage caused to or by the aforesaid Contractor of any of the terms of conditions, stipulations or undertakings of any case of them contained in the same agreement and documents attached thereto and for the payment of any money or moneys payable by the said contractor to the Principal under the terms and conditions of the said agreement. (the decision regarding the breach, loss, damage or payment due being solely in the discretion of the Principal).

We further undertake to pay without demur the aforesaid amount in a lumpsum on demand or such part hereof as the Principal may demand from time to time irrespective of the fact whether the said Contractor admits or denies such claim or question its correctness in any Court, Tribunal or arbitration proceedings or before any authority. The aforesaid guarantee will remain in force and we shall be liable under the same irrespective of any concession or time being granted by the Principal to the Contractor in or for fulfilling the said Agreement between Contractor and the Principal and the guarantee will remain in full force irrespective of any change of terms, conditions or stipulations or any variation in the terms of the said Agreement irrespective of whether notice of such change or variation is given to us or not and claim to receive such notice of any change/and/or variation of the terms and/or conditions of the said agreement is hereby specifically waived by us.

Further we shall not be released from the guarantee by any forbearance or the exercise or non-exercise of any of the powers or rights under the said agreement by the Principal against the Contractor irrespective of whether notice of such forbearance enforcement or non-enforcement of any powers or rights, modifications or changes made in the agreement or concessions shown to Contractor by the Principal is given to us or not.

The Guarantee herein contained shall not be determined or affected by the liquidation or winding up or insolvency of or change in the constitution of the Contractor but shall in all respects and for all purposes binding and operative until all payments of all moneys due or that may hereinafter become due to the Principal in respect of any liabilities or obligations of the contractor under the said agreement.

The Bank guarantee shall be valid till i.e. 12 months after completion of works as per relevant clause of Tender Specification No._____

Any claim or dispute or disputes a rising under the terms of this document shall be enforced or settled in the Courts at NAGPUR only.

And lastly the undertaken not to revoke this guarantee during its currency except with the previous consent of the Principal in writing.

The Bank hereby declares that it has powers to issue this guarantee under the Bank's Memorandum and Articles of association and undersigned has full Powers to do so on its behalf under the Power of Attorney granted to him by the proper Authorities of the Bank.

(Name of the Bank & Place)

DATED:

SEAL

DESIGNATION OF THE AUTHORISED
PERSON SIGNING THE GUARANTEE

BHARAT HEAVY ELECTRICALS LIMITED
(A Government of India Undertaking)
Power Sector– Western Region
345, Kingsway
Nagpur – 440 001

CONTRACT AGREEMENT

AGREEMENT NO._____ DATED _____

NAME OF WORK	
NAME OF THE CONTRACTOR WITH FULL ADDRESS	
AMOUNT OF TENDER ACCEPTED	
LETTER OF INDENT NO.	
TIME ALLOTTED FOR COMPLETING THE WORK (DATE OF COMPLETION)	

_____ _____
CONTRACTOR (OFFICER AUTHORISED TO SIGN AGREEMENT)

CONTRACT AGREEMENT

This Agreement made this day, the _____ between BHEL having its Registered Office at BHEL HOUSE, SIRI FORT, NEW DELHI (hereinafter called the FIRST PARTY) thru BHEL, POWER SECTOR-WESTERN REGION, SHREEMOHINI, 345, KINGSWAY, NAGPUR – 440001, of one part and _____(hereinafter called the "CONTRACTOR" of the SECOND PARTY).

02 WHEREAS the first party is desirous of executing the work of _____ _____ more particularly described in the appendices including drawings and specifications attached herewith.

03 WHEREAS in pursuance of the said contractor's tender having been accepted the first party has decided to give the above said work to the Contractor.

04 WHEREAS the said Contractor has agreed to do the herein contained in these presents, instructions to tenderer, general conditions and special conditions (hereinafter referred as the said contract schedule) at approved rates (hereinafter referred to as the said contract rates).

05 AND WHEREAS the said contractor has furnished the Bank Guarantee of Rs. _____ (Rupees _____only) towards initial 50% Security Deposit for the complete work and has further agreed for balance amount of Rs. _____ Security Deposit being recovered at 10% value of each running bill till the full security deposit is made up for the satisfactory completion and performance of the work and whereas the validity of the said Bank Guarantee has to be executed by the contractor, if so required for the extended period of contract period and in the event of his failure to do so, the contractor shall pay or accept the recovery of this amount of Rs. _____ from the bills forthwith in one installment and it has further been agreed that the failure to extend the validity of Bank Guarantee or failure to pay the aforesaid amount in the manner specified above shall constitute the breach of the contract and first party reserves the right to take any legal action deemed fit for recovery of the said sum of Rs. _____. This amount of Rs. _____ will be refunded (and Bank Guarantee will be returned) to the contractor on satisfactory completion of the work as specified in the contract documents.

06 Now these presents witness that in consideration of the said contract schedule and said contract rates, as also of agreement of good and faithful service to be rendered and performed by the contractor in the execution of the said work subject to the stipulation hereinafter expressed.

07 That the said contractor will perform the aforesaid work subject to the conditions contained in these presents, instructions to the Tenderers, General and Special Conditions of Contract and the Contract documents attached herewith including the said schedule, Specifications, Appendices, Letter of Indent, drawings attached and also such other drawings and instructions as may from time to time be given by the first party.

08 And that the said contractor shall be deemed to have carefully examined the specifications and Conditions of Contract, Appendices, Schedules, Letter of Award, Drawings etc. as aforesaid and also to have satisfied himself as to the nature and character of work to be executed.

09 That the said contractor shall carryout and complete the execution of the said work to the entire satisfaction of the Engineer-In-charge within the agreed time schedule.

10 That the first party after proper scrutiny of the bills submitted by the said contractor will pay to him during progress of the said work at said contract rates and agreed terms of payment, a sum as determined by the first party in respect of the work executed by the contractor.

11 That the contract shall come into force with retrospective effect from the date on which Telex/Fax Letter of Indent was issued to the contractor.

12 That whenever under this contract or otherwise any sum of money shall be recoverable from or payable by the contractor, the sum may be deducted in the manner as set out in the conditions of the contract aforesaid.

13 That all charges on account of Octroi, terminal and sales tax or other duties on material obtained for the work shall be borne by the said contractor.

14 This is agreed between the parties that the non-exercise of any of the powers conferred on the authorities of the first party will not in any manner constitute waiver of the conditions hereto contained in these presents and the liability of the said contractor either of past or future compensation shall remain unaffected.

15 That the expression BHEL means the Bharat Heavy Electricals Limited, BHEL House, Siri Fort, New Delhi, Through BHEL, Power Sector-Western Region, "Shreemohini Complex", 345, Kingsway, Nagpur – 440 001.

The documents hereto attached viz: -

1 _____

2 _____

3 _____ etc.

shall also form part of this agreement.

In WITNESS hereto the parties have respectively set their signature in presence of:

WITNESS (with full address)
1.
2.

Signature of the Contractor
(To be signed by a person holding valid Power of Attorney of the Company)

WITNESS (with full address)
1.
2.

For and on behalf of
BHARAT HEAVY ELECTRICALS LTD

DATE_____