Tender Specification

NO.BHE/PW/PUR/SMH-HTE/541

Development of infrastructure, receipt & unloading of materials/parts at stores/storage yard, loading at stores/storage, transportation from stores/storage to erection site, unloading at power house site, assembly, erection, testing and commissioning of 10x40 MW Hydro-Electric Generating units with related auxiliaries.

At

Maheshwar Hydro Electric Project

Mandleshwar

Distt. Khargone (M.P.)

PART - I

{TECHNICAL BID SPECIFICATION, NOTICE INVITING TENDER & GCC}

Book No

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

C O N T E N T S

SN	DESCRIPTION	SECTION/ APPENDIX No.	No. OF PAGES
26.	MAJOR T&P & MMD TO BE DEPLOYED BY THE CONTRACTOR	APPENDIX-IV	02
27.	ANALYSIS OF TOTAL RATES QUOTED	APPENDIX-V	01
28.	MONTHWISE MANPOWER DEPLOYMENT PLAN BY THE CONTRACTOR	APPENDIX-VI	01
29.	CONTRACTOR'S MAJOR T&P DEPLOYMENT PLAN	APPENDIX-VII	01
30.	DETAILS OF CONCURRENT COMMITMENT	APPENDIX-VIII	01
31.	LIST OF SIMILAR JOBS DONE IN LAST SEVEN YEARS.	APPENDIX-IX	01
32.	RATE SCHEDULE (PRICE BID:PART-II)		@

$: ATTACHED AT THE END OF HARD COPY OF TENDER SPECIFICATION. ALSO HOSTED IN WEB PAGE AS PART OF NOTICE INVITING TENDER (FILE TITLED "NIT+GCC-541").

@: ISSUED AS A SEPARATE BOOKLET AS HARD COPY AS PART II (PRICE BID SPECIFICATION) AND AS ALSO HOSTED IN WEB PAGE AS SEPARATE FILE TITLED "PRICE-BID-541".

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

TENDER SPECIFICATION ISSUE DETAILS.
TENDER SPECIFICATION NO:- BHE/PW/PUR/SMH-HTE/541

FOR

NAME OF WORK :Development of infrastructure, receipt & unloading of materials/parts at stores/storage yard, loading at stores/storage, transportation from stores/storage to erection site, unloading at power house site, assembly, erection, testing and commissioning of 10x40 MW Hydro-Electric Generating units with related auxiliaries at Maheshwar HEP, Mandleshwar, Distt. Khargone (M.P.)

EARNEST MONEY DEPOSIT Rs. 2,00,000/- (RUPEES TWO LAKH ONLY) . FOR MORE DETAIL, PL REFER SECTION-15

THESE TENDER DOCUMENTS CONTAINING **PART-I** : TECHNICAL BID AND **PART- II** : PRICE BID, ARE ISSUED TO:

M/s.....

.....

(THESE TENDER DOCUMENTS ARE NOT TRANSFERABLE)

FOR BHARAT HEAVY ELECTRICALS LIMITED

SENIOR MANAGER (Purchase)

PLACE: NAGPUR
DATE :

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.

EARNEST MONEY DEPOSIT (EMD)

EMD shall be included in the Technical Bid. **EMD shall be paid by bidders only in the form of account payee Demand Draft payable at Nagpur in favour of Bharat Heavy Electricals Limited.** No other mode of payment of EMD shall be acceptable.

Bidder may opt to deposit "One Time EMD" of Rs. 2.0 lacs with this office (BHEL:PSWR:Nagpur) which will enable them to participate in all the future tender enquiries in respect of Erection and Commissioning services issued from this office. Interested bidders may clearly send their consent for converting the present EMD into an "One Time EMD" in their offer.
Bidders who have already submitted such "One Time EMD" will be exempted from submission of any EMD for this tender. However bidder shall furnish details of the "One Time EMD" in his offer including the Check List furnished herein.

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. GENERAL 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. BIDDER SHALL MEET ALL THE QUALIFYING REQUIREMENTS AS MENTIONED IN THE NOTICE INVITING TENDER.

5. ALL INFORMATION AS CALLED FOR IN VARIOUS APPENDICES AND CLAUSES OF TENDER SPECIFICATION, SHOULD BE FURNISHED. PLEASE REFER THE CHECKLIST. THE DETAILS SO FURNISHED BY TENDERER SHOULD BE COMPLETE IN ALL RESPECTS AND AS PER FORMATS SPECIFIED IN TENDER SPECIFICATION.

6. **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.

7. TENDERER SHALL NOTE THAT THEIR OFFER WILL BE CONSIDERED SUBJECT TO THE APPROVAL OF BHEL'S CUSTOMER.

8. BIDDER MUST SUBMIT HIS OFFER ALONG WITH THIS TENDER SPECIFICATION DULY SIGNED AND STAMPED .

9. BIDDER MUST SUBMIT ALL THE DOCUMENTS AS SPECIFIED IN CHECK LIST OF THIS TENDER AND AS PER QUALIFYING REQUIREMNT (QR) OF NIT AS A PART OF TECHNICAL BID OF YOUR OFFER. INCOMPLE OFFER SHALL BE REJECTED.

PROJECT INFORMATION

Project Information

Site Address : Maheshwar Hydro Electric Project
Post : Mandleshwar
Tahsil : Maheshwar
Dist : Khargone (M.P.)
Pin : 451221

Nearest Airport : Indore

Nearest Railhead : Indore (BG)

Max. Temperature : 47.5 Degree Celsius

Min. Temperature : 1.2 Degree Celsius

Relative humidity-

a) Max. : 87.5 %

b) Min. : 12 %

Average annual rain fall : 930 mm

No. of rainy days (average): 48

The Site is located at a Distance of app. 100 Km from Indore.

The bidders are however, advised to acquaint themselves with the site conditions, before quoting. No compensation whatsoever, on account of lack of familiarization with these, subsequent to quoting, will be entertained.

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 1) One Time EMD or, 2) Only for this Tender	DD No. ……. DD Date……. Name of Bank……... Amount: Rs…….		
5	Validity of Offer (BHEL's Requirement: 180 days from Last Date of tender submission)	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		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

Check List (Vide Para 1.3 Of Section-I of General Conditions Of Contract)			
14	**Audited 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
16	Copy of **IT Return** of last three financial years along with copy of **PAN Card** are Furnished	Yes	No
17	Month-wise **Manpower Deployment Plan** is furnished	Yes	No
18	**Analysis of Total Quoted Rates** quoted is furnished	Yes	No
19	**Month-wise deployment plan for major T&P** 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	Yes	No
26	Whether **copies of detailed Work Orders (with BOQ)** and **Completion Certificates** in support of above furnished	Yes	No
27	Whether contractor has left any job unfinished? If so, give reasons.	Yes	No
28	Whether any client has terminated the contractor's work before completion? If so, furnish reasons for the same	Yes	No

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

Date: Signature of Bidder

DECLARATION BY BIDDER'S AUTHORIZED SIGNATORY

I, HEREBY CERTIFY THAT ALL THE INFORMATION AND DATA FURNISHED BY ME WITH REGARD TO THE TENDER SPECIFICATION No. **BHE/PW/PUR/SMH-HTE/541** 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/SMH-HTE/541

I/WE, M/s …….

HEREBY CERTIFY THAT IN OUR OFFER I/WE HAVE NEITHER SET ANY TERMS AND CONDITIONS NOR THERE ANY DEVIATION TAKEN FROM THE TENDER CONDITIONS EITHER TECHNICAL OR COMMERCIAL AND I/WE AGREE TO ALL THE TERMS AND CONDITIONS MENTIONED IN THE TENDER SPECIFICATION.

SIGNATURE OF THE TENDERER

DATE:

CERTIFICATE CONFIRMING

KNOWLEDGE OF SITE CONDITIONS

We, M/s ……

hereby declare and confirm that we have visited the project site at MAHESWAR HEP as referred in BHEL's Tender Specification No. BHE/PW/PUR/SMH-THE-541 and acquired full knowledge and information about the site conditions. We further confirm that the above information is true and correct and we shall not be eligible for any additional payment of any nature due to lack of knowledge or non-familiarization of site conditions.

BIDDER'S NAME AND ADDRESS

SIGNATURE & OFFICIAL SEAL OF
BIDDER'S AUTHORISED SIGNATORY

PLACE:

DATE:

SECTION-3
OFFER OF THE CONTRACTOR

SENIOR MANAGER (Purchase)
BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR - WESTERN REGION
SHREEMOHINI COMPLEX
345, KINGSWAY
NAGPUR- 440 001

DEAR SIR,

I/WE HEREBY OFFER TO CARRY OUT THE WORK DETAILED IN TENDER SPECIFICATION NO. BHE/PW/PUR/SMH-THE-541 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 LISTED 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 FOR A SUM OF RS. 2,00,000/- (RUPEES TWO LAKH ONLY) 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 BE INDICATED BY BHEL, POWER SECTOR-WESTERN REGION, NAGPUR.

I/WE FURTHER AGREE TO EXECUTE ALL THE WORKS REFERRED TO IN THE SAID DOCUMENTS UPON THE TERMS AND CONDITIONS CONTAINED OR REFERRED TO THEREIN AND AS DETAILED IN THE APPENDICES ANNEXED THERETO.

PLACE: SIGNATURE OF TENDERER:
DATE : ADDRESS:

WITNESSES WITH THEIR ADDRESS

	SIGNATURE	NAME	ADDRESS
1.			
2.			

Section-4

Special Conditions of Contract

Scope of Work:

Development of infrastructure, receipt & unloading of materials/parts at stores/storage yard, loading at stores/storage, transportation from stores/storage to erection site, unloading at power house site, assembly, erection, testing and commissioning of 10x40 MW Hydro-Electric Generating units with related auxiliaries at Maheshwar HEP, Mandleshwar, Distt. Khargone (M.P.)

The scope of work will broadly comprises:

1) Grading / leveling of land and fencing of open yard of app. 150X200M area, providing entry / exit gate to store, security post, constructing closed storage sheds, office for BHEL staff, illumination of storage sheds/yard and office and arrangement for Construction Power in power house.

2) Receipt, unloading of materials, checking & verification, stacking, storage, preservation, providing material management services, generation of shortages/ damages reports during transit, lodging of insurance claims with under writers and follow up for settlement of insurance claims of all plant materials including Electrical, Control & Instrumentation Equipments, Auxiliaries and associated items/components.

3) Collection of materials from stores/storage yard, loading at stores/storage yard, transportation to erection site/site of work, unloading at site/Power house, assembly, Trial assembly, erection, testing and commissioning, Conductance of related inter-stage & final stage electrical tests & Hydro test, Chemical cleaning/flushing, Hydraulic Testing, Brazing, U.T. testing, taping & insulation, painting/ finish painting etc. of 10 units of 40MW each, with umbrella type generators coupled to full Kaplan type turbines with auxiliaries and associated equipments etc.

4) The contractor scope also includes receipt, unloading, and storage preservation of other supplied equipments for all units / Power House.

4.0.2 Contractor has to work simultaneously on more than one unit round the clock as the work progresses. He shall augment his resources to meet the schedule of work as per BHEL/SMHPCL requirement. Bidders shall take in account of all such necessities in their offer.

4.0.3 The terminal points decided by BHEL shall be final and binding on the contractor for deciding the scope of work.

4.1 General details Regarding The Scope Of Work

4.1.1 The work covered under this specification is of highly sophisticated nature, requiring the best quality workmanship, engineering and construction management. The contractor should ensure successful and timely completion of work under this specification. The contractor must deploy adequate quantity of measuring & monitoring instruments, tools/tackles, construction aids, consumables and equipment etc. in consultation with BHEL. He must also deploy adequate trained, qualified and experienced supervisory staff and skilled personnel to meet the work schedule.

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

4.1.3 The work shall be executed under the usual conditions affecting hydro power plant construction and in conjunction with numerous other operations at site. The contractor and his personnel shall cooperate with personnel of SMHPCL and their other contractors, coordinating his work with others and proceeds in a manner that shall not delay or hinder the progress of work as a whole.

4.1.4 The entire 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, sequence of erection etc. prescribed depending upon the requirement of site shall be final and binding on the contractor. No claims for extra payment from the contractor will be entertained on the ground of deviation from the methods adopted in erection of similar power station.

4.1.5 The contractor shall perform services and tests etc. that may not be specified but nevertheless required for completion of the work within the quoted rates.

4.1.6 All necessary certificates, licenses, and clearances, from concerned appropriate authorities including statutory authorities if any, required to carry out this work are to be arranged by the contractor expeditiously at his cost.

4.1.7 The work shall conform to dimensions and tolerances specified in the various drawings and documents that will be provided during the erection. If any portion of the work is found to be defective in workmanship, not conforming to drawings or other stipulations, the contractor shall dismantle and re-do the work duly replacing the defective materials at his cost, to the satisfaction of BHEL.

4.1.8 On account of feed back from various power stations or units already commissioned and/or units under erection and commissioning and also on account of design discrepancies, manufacturing defects and site operation & maintenance requirements during the course of erection, testing and commissioning of equipments, etc, certain rework/ modification/ rectification/repairs/fabrication etc. will be necessary. Contractor shall carry out 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 from BHEL engineer every day. Claims of contractor, if any, for such work will be governed by the provisions of Section-13.

4.1.9 All tools, tackles, manpower, consumables etc, required for completing this work shall be provided by the contractor during the contract period and also the extended period, if any, though such extension may not be attributable to the contractor. Services of one No. E.O.T. crane of 60T capacity for unloading of material from unloading bay to service bay and 2 Nos. E.O.T. cranes of 110/30T capacity with a tandem-lifting beam will be provided in the powerhouse. The cranes will be suitable for tandem operation. It shall be the responsibility of the contractor to operate and maintain the E.O.T. cranes during the execution of the contract by providing adequate number of qualified operators and electricians.

It shall also be the responsibility of contractor to keep the crane in good working condition. The contractor shall note that the E.O.T. crane along with the operator shall also be made available for the erection of equipment by other agencies required for the commissioning of the generating units as a whole. The E.O.T. cranes after completion of erection shall be handed over to SMHPCL in good working condition.

The contractor scope also include to arrange shifting / dragging and positioning of equipments under the scope of this contract for assembly and installation for the equipments those are beyond the accessibility of E.O.T. crane

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

Contractor shall maintain the work area free of debris and scrap material etc

4.1.11 Use of permanent plant materials like angles, channels etc. are prohibited from use in temporary arrangements like scaffoldings etc. The contractor shall provide materials for such arrangements.

4.1.12 In respect of materials supplied by BHEL, the contractor has to render accounts for consumption and return the surplus in good condition.

4.2 Development of Infrastructure:-

1) Development of land measuring app. Area of 150MX200M, barbed wire fencing around the store yard, making suitable temporary roads within storage yard. Construction of plinths, as per requirement for storing of material and construction of 3 Nos. closed storage sheds of 10MX40M size and 1 No. closed shed cum office shed of 10MX40M in which area of 25Mx10M shall be for BHEL office, shall be done as per the drawings / specifications provided by BHEL. The land shall be given free of charge by SMHPCL, which will be app. 1.5 KM from power house, inside the project complex. The sketch for Plan and foundation details of Closed sheds and Closed Shed cum Office shed are attached separately.

2) Required area electrification, lighting for the storage yard and providing sufficient illumination in the closed storage sheds and office is in the scope of the work. The contractor has to arrange suitable transformer of 100 KVA for taking power supply from nearby 11 KV line and distribute the same to store yard and office and maintain entire arrangement for fully safe and satisfactory working condition till the completion of contract period and extended period, if any. The electricity shall be provided free of charge by SMHPCL.

   All required materials / arrangements for fencing, constructing storage sheds / office etc. and complete electrical fittings and illumination etc. in storage yard / sheds / office, shall be arranged by the contractor under the scope of this work.

   Development of land and fencing of store yard should be completed within a month and all other work such as Constructions of sheds /office and lighting etc. should be ready within three months after placing of order by BHEL.

3) SMHPCL shall provide construction power supply free of charge from 11 KV feeders. Contractor has to take tapping from 11 KV feeders (app. ½ km from PH), for which they have to arrange 1 No. 11 KV/440V / 500KVA transformer and lay the line for construction power supply up to the Power house. All necessary arrangements including poles, transmission line, cables, distribution boards in power house etc. are to be arranged by the contractor and same shall be maintain

by the contractor in fully safe and satisfactory working condition throughout the contract period and extended period, if any.

Construction power supply at power house should be ready within 1 month after placing of order by BHEL.

[The Specification and requirements for above works under Sl. Nos. 1), 2) & 3) shall be as per Annexure "SPECIFICATION FOR SITE OFFICE BUILDING & CLSODED STORAGE SHEDS AND DEVELOPMENT OF OPEN STORAGE YARD TO BE CONSTRUCTED AT SREE MAHESHWAR HYDRO POWER LIMITED attached at the end of this Section-4

4.3 Scope Of Work For Material Receipt, Unloading, Transportation, Stacking And Materials Management.

The detailed scope of work given below is intended to be for the information and not exhaustive. Fabrication of bends, tees etc. as per requirements are included in the scope of work. The work will be inclusive of but not limited to the description given below which is only brief in nature

4.3.1 The scope of work material handling and transportation and materials management is broadly as under:

Receipt of material at store / storage yard, unloading from transport vehicles, collection from transporter's godowns, unloading at store / storage yard, verification, stacking, storing, preservation including unloading of some components directly at site with attendant works as above and providing assistance for materials' management. The contractor has to deploy one No. 20 Tons and one No. 10 Tons mobile crane within 15 days after placing of order and these shall be kept permanently at site till the completion of the work. These mobiles cranes can be taken out from site after completion of the work with the written consent of BHEL. For unloading higher load, contractor shall arrange additional cranes of suitable capacity / make necessary arrangement as per requirement in such a fashion that material is unloaded on the same day of its arrival. Scope of work is further detailed in various clauses hereafter.

4.3.2 Details of major packages to be handled for each unit are as under:-

A) Hydro Turbine & its associated equipment/accessories.

B) Hydro Generator & its associated equipment/accessories

C) SEE, Controls, Protection and Instrumentation panels and accessories.

D) Cables, cable trays

E) Transformers including heavy Equipments like Generator Transformers, Station Transformers etc.

F) Structural steel

G) Other BHEL supplied (manufactured/bought out items)

Packages.

H) Other items received from other sites/locations.

4.4 It will be responsibility of the contractor to keep in touch with officials of BHEL and SMHPCL regarding arrival of consignments and other formalities. The contractor shall collect all the lorry waybills or any other such document from BHEL site office. The contractor shall arrange for regular collection of dispatch documents etc

4.4.1 Payment of all demurrages etc. which result due to contractor's fault, would be the responsibility of contractor and to his account. If BHEL have to make payment of demurrage etc together with freight, the amounts so paid as demurrages for the reasons stated above shall be paid to BHEL by the contractor forthwith or would be recovered from running bills of the contractor.

4.4.2 It would be responsibility of the contractor to examine the packages, consignments etc. on arrival and bring to the notice of BHEL authorities regarding loss/damage, if any, observed in the consignments before taking delivery of the same.

4.4.3 In case of consignments in smalls, the weight of package shall be checked with the invoiced weight of the packages and any discrepancies shall be reported immediately to BHEL/ transporter. For all such consignments, observations regarding loss/damage are to be recorded in appropriate document and inform BHEL. In case it becomes necessary to take open delivery from the authorities, contractor should make all arrangements for taking open deliveries. All expenses connected therewith shall be to the account of contractor. Any loss that accrues to BHEL on account of such failures shall be debited to the contractor's bill and recovery effected from his running bills.

4.4.4 Any discrepancy/shortage/damage found in the consignment after taking delivery from the carriers after giving clear receipt would be the responsibility of contractor and the amount liable to be loss by BHEL on such accounts is recoverable from the contractor.

4.4.5 Since the consignments are expected to arrive during any time of the day, contractor shall have his workmen round the clock at site as well as other places as required to unload the materials. Also, consignment coming on weekly off days as also on holidays is required to be handled by the contractor. Contractor shall make all arrangements and obtain all approvals as may be applicable.

4.4.6 Unloading at storage area/work site of heavy/sophisticated equipment shall be done in the presence of and as per directions of BHEL representative including stacking and restacking, if necessity arises.

4.4.7 The contractor shall verify the materials on receipt as per instructions. Contractor shall provide facilities to open packages, where required in

the presence of BHEL engineer, verify the contents, repack wherever and whenever called for and properly stack them as per storage manual or/and as may be directed by BHEL.

4.4.8 The contractor shall provide wooden/concrete sleepers required for stacking of materials and suitable arrangement for covering of material.

4.4.9 The material shall be so stacked that it should facilitate easy retrieval and handling for issue. Where indicated improper stacking same shall be corrected.

4.4.10 The contractor shall execute the work in the most substantial and workmanlike manner. The stores shall be handled with care and diligence. Any loss to BHEL/SMHPCL due to contractor's lapse shall have to be made good by the contractor.

4.4.11 If the contractor or his workmen or employees shall break, de-face, injure or destroy any part of a building, road, fence, enclosures, water pipes, cables, drains, electric or telephone posts or wires, trees or any other property or to any part of erected equipments, stored components etc., the contractor shall make the same good at his own expenses.

4.4.12 Loading on to the transporter's trailer/truck for onward transmittal to other destinations is also in the scope of work of contractor. Payment for these shall be made as per relevant items of rate schedule.

4.4.13 Contractor shall arrange for cutting and removal of vegetation growth/grass etc. in the storage yard as and when called for by BHEL as incidental to work. BHEL will take appropriate action at the risk & cost of the contractor in case of failure in this regard.

4.4.14 Generator Transformers/Main Step up Transformers and Service Stations Transformers on their receipt at site, shall be unloaded within the distance of 30 meters from their respective foundation/Rail head locations as scope of work.

4.5 Scope of Work for Providing Materials Management Services

All arrangements for display of location placards, repainting of material identification codes etc. are incidental to work.

4.5.1 To maintain the records and supervise, issue of materials as per requirements.

4.5.2 To maintain the complete material management records and generate periodic status reports as required by BHEL.

This shall also include maintenance of database on web-based application, which shall be provided by BHEL. Generation of various reports regarding material dispatches, receipts, issue, pending and critical materials etc.

The personnel deployed for materials management services shall be exclusively available at BHEL's discretion.

4.6 Preservation of components

Contractor shall arrange for preservation of components as per the instructions of BHEL engineer.

One or more of following method will have to be adopted for preservation:-

1) Coating with preservative paints/lubricant/inhibitors
2) Capping/wrapping/covering
3) Filling/immersion in oil/chemicals etc.

4.7 Restacking / Re-Handling

Over a period of time, restacking the materials may arise due to various reasons. The handling of such items will also be in the scope of this contract. The restacking/ re-handling may be necessitated for any equipment/materials covered within this work specification.

4.8 Record Keeping and Report Generation

All the above functions of material dispatches, receipt, stacking, preservation, issuing etc will have to be properly recorded in the prescribed formats, registers etc manually and on computer and made available for verification by BHEL. The report generation will be exhaustive and will cover details like stock at site, pending materials to be received, materials in transit, components issued to the contractor, location plans of items stacked and other material status documents.

All personnel deployed for materials management should necessarily be proficient in computer operation. They should be capable of data entry in computers, report generation as prescribed and information management. Printouts of required information in the prescribed manner shall be taken by these personnel.

4.9 Other Points:

4.9.1 BHEL engineer's decision shall be final regarding the type and nature of painting to be done on the components as also for arranging the components sequentially to suit erection requirements.

4.9.2 Contractor shall provide manpower for secretarial assistance for office and stores. Such manpower shall be experienced in office secretarial works including stenography and be proficient in computer operations.

4.9.3 Cranes:

BHEL is not providing any crane for this work. Services of customer EOT crane at power house building (Hydro-Gen- Building) for unloading of materials in unloading bay / service bay will be provided only for erection work as per availability free of hire charges.

4.10 It will be responsibility of the contractor to arrange all required items/arrangements for unloading of all incoming material at stores/storage yard and he shall ensure safe lifting of equipments, taking due precaution to avoid any accidents and damage to material / equipments and personnel.

4.11 Scope of work for Hydro turbine, Generator & Auxiliaries:

4.11.1 Preparation of Foundation

4.11.2 Foundation and other necessary civil works for supporting structures, equipments etc. will be provided by SMHPCL. It shall be the contractor's responsibility to check the various equipment foundations for their correctness with respect to benchmarks of level, orientation, co-ordinates etc. These dimensions shall be measured, logged and submitted to BHEL for approval prior to erection of equipments. Minor chipping or dressing of concrete foundations up to 50 mm for obtaining proper level and alignment for packer plates/shims, enlarging of the pockets in foundation etc. as may be required for the erection of the equipments/plants will have to be carried out by contractor without extra cost. A joint log sheet before taking over the foundations shall be prepared by contractor.

4.11.3 Any fixtures, minor foundations, anchors, concrete block supports, steel structures, required as temporary supports/platforms during pre-assembly or any other similar requirements during all stages of this work shall be arranged by the contractor using his own materials etc. as per the approval of BHEL.

4.11.4 Cleaning of foundation surfaces, pocket holes, de-watering and making them free of oil, grease and sand and other foreign materials by water washing, compressed air and other approved methods are within the scope of work.

4.11.5 Stacking of material should not lead to the congestion of work site for the contractor as well as other agencies working there. Shifting, re-stacking, if required, shall be done by the contractor expeditiously as part of work.

4.11.6 All equipments shall be handled very carefully to prevent any damage or loss.

4.12 Embedded Pipes In First Stage:

M/S SMHPCL have already erected drain pipes of penstock / spiral casing, draft tube of all units and common header for dewatering. Necessary further fittings such as valves and other mounting etc. are to be done by the contractor.

4.13 Embedded Pipes In Second Stage Foundation:

Pipes such as drainage, dewatering, air breather pipe, cooling water inlet/discharge pipes of turbine and generator, air Intake pipes for air valve, top cover drain pipes, siphon drain pipes and embedded pipes in turbine –generator barrel such as Peizometric pipes, cooling water pipes to shaft gland and pressure balancing pipes, air intake pipes to air valve, flow meter pipes etc. inline with the relevant drawings, embedment of anchor hooks etc. wherever called for as per relevant drawings shall also be carried out by the contractor.

4.14 Draft Tube Liner and Draft Tube Cone:

Lowering of draft tube liner and draft tube cone segments, matching, welding, grinding, testing of weld joints, rectification, if any, and handing over for concreting. Required electrodes for welding shall be supply by BHEL free of cost.

(The pier noses of all the units are already installed in position by SMHPCL.)

4.15 Stay ring / Spiral Casing:

Assembly of stay ring segments, bolting, elongation of bolts, seal welding, lowering on pedestals, its alignment and installation and handing over the same to SMHPCL for spiral casing casting. The spiral casing would be of concrete and its concreting shall be done by SMHPCL.

4.16 Runner Envelope:

Assembly of runner envelope in halves, welding, testing, and its assembly on stay ring, and its final welding on to stay ring with stay ring/DT cone compensating cone etc. Required welding electrodes for this work shall be supply by BHEL free of cost.

4.17 Pit Liner:

Lowering of pit liner segment in halves on stay ring, their assembly, matching, welding, alignment and leveling with respect to unit centerline, welding on to stay ring. Welding of anchors, assembly of various second stages embedded pipes as per drawing, installation of GV servomotors base plates and handing over for concreting. Required welding electrodes for pit liner assembly shall be supply by BHEL free of cost.

The grout holes, if any, on pit liner shall be provided according to the direction of BHEL, wherever required. Plugging of grout plugs/holes after concreting shall be carried out at no extra cost.

4.17.1 Internal Embedment:

Necessary embedment such as level control boxes in DT cone and embedded pipes for supplying air through top cover and any other as per relevant drawing shall be in the scope of the contractor.

4.18 Guide Apparatus:

4.18.1 Pivot Ring:

Assembly of pivot ring halves, bolting, seal welding and alignment, leveling and fixing on to stay ring and doweling.

4.18.2 Top Cover:

Assembly of outer(in quadrants) and inner top cover in halves, seal welding of joints, leveling, alignment and fixing of outer top cover on stay ring and inner top cover on outer top cover.

Guide Vane Assembly:

Cleaning, lowering and assembly of guide vanes on pivot ring, lowering of outer top cover on to stay ring. Setting of pivot ring / outer top cover, fixing of bush housing assembly, checking of guide vane top/bottom clearances, bedding between successive guide vanes, grinding and rectification, if any, to achieve drawing requirements. Assembly of guide vane levers, shear pin and linkages and permanent doweling of top cover and pivot ring.

4.18.3 Regulating Ring:

Assembly of regulating ring on to top cover, inter connection of guide vanes through linkage mechanism, inter connection of guide vane servo motor (LH & RH) through connecting rods.

4.18.4 Guide Vane Servo Motors:

Dismantling the assembled servomotor received, inspection of piston ring, rubber seals etc, cleaning, over hauling and reassembly of parts. Pressure testing of closing and opening chambers, measurement of servo motor stroke length, installation of servo motors in the pit liner housing, alignment and leveling, interconnection with regulating ring and establishing the movement of guide vanes with governor oil system and locking of servo motor, doweling.

4.18.7 Feed Back Mechanism:

Fixing of bracket on the connecting rod of the guide vane servomotor. Fixing of supports for the pulleys on the pit liner, outer face of the barrel, oil piping ducts, fixing of pulley assemblies at various locations, routing of wire rope through the pulleys up to the HMC cabinet for establishing feed back signal according to the requirement. Feedback arrangement for runner shall be done after installation of oil header etc.

4.19 Runner Assembly:

The runner components received in parts such as runner hub, blades, trunions etc. shall be cleaned thoroughly, degreased and assembled with reference to various match marking already put at shop, tested for free movement of the blades manually. The piston with piston rings, piston rods shall also be assembled along with the turbine shaft, oil tube of runner servo and coupled.

The movement of runner blades shall be checked with 5Kgs/ cm^2 oil pressure, or as may be indicated in the relevant drawings (checking for free movement), hydro static testing of runner shaft assembly shall be carried out according to the relevant drawings and locking wherever required .

4.20 Oil Header:

Oil header shall be mounted on the top of generator on brush gear casing and shall incorporate parts for supplying the oil to the runner blade servomotor cavities. It shall be complete with special piping/arrangement for passing down oil to the runner. Provision for

feedback mechanism for runner blades is made in oil header assembly.

4.21 Shaft:

Cleaning of shaft, bearing journals, coupling flanges, proving coupling bolts on runner side as well as generator side and rectification, if any. Bedding of TGB pads with bearing journal in service bay, scraping, if any, assembly of shaft on to runner and coupling including elongation of coupling bolts, assembly of rotating sleeve of shaft gland inline with drawing and making the runner shaft assembly ready for lowering. Nut guard assembly shall be done after final coupling of turbine generator shaft.

4.22 Shaft Sealing:

Dismantling, cleaning, matching of flange faces and assembly of shaft gland, rubber isolating seal inline with drawing, pressure testing of rubber isolating seal, necessary air and water piping to shaft seal including doweling.

4.23 Guide Bearing:

Dismantling, cleaning of bearing housing, hard wares, assembly of bearing housing, oil bath ,bearing pads, bearing setting and locking, including instruments like RTD's, DTT's, doweling of housing and assembly of bearing cover, oil level gauge, float etc, complete including installation of connected oil piping from sump tank to bearing and back inline with drawing. (The housing after assembly shall be tested for leakage with kerosene oil, before setting of pads.)

4.24 Turbine Platform and Monorail etc:

1) Cleaning, marking, matching, welding of supports and laying of chequered plates, fixing with hardware (including drilling, tapping etc), installation and fixing of handrail inside the turbine pit.

2) Installation of monorail inside the turbine pit including match marking, welding of supports and fixing of monorail etc.

4.25 Pipes in Turbine Pit:

Dismantling, over hauling, testing and installation of air valves. Installation and testing of top cover drain pumps, assembly of cooling

water pipes for shaft gland ,including flow indicators/ relays, air valve piping, compressed air pipe to shaft seal, top cover, drain pipe, siphon arrangement with piping for draining the water collected in the turbine pit etc, including weld testing, hydrostatic testing wherever required inline with respective drawings. Installation of level relays inside top cover for monitoring the water level and auto operation of top cover drain pumps.

4.26 Governor and Governor Oil System:

Cleaning, overhauling, assembly and installation of governor cabinets (HMC and Runner control Mechanism), PP set, pressure receivers, and associated oil piping, air piping. Making all connections, pressure testing of oil pipes, acid cleaning, oil flushing before final assembly. Testing of pumps, setting of idler valves, pressure switches etc. complete and commissioning the system.

4.27 Compressed Air System :

The HP compressed air system for governing oil system of turbine, complete with two air compressor motor sets, two air receiver, pressure switches, pressure reducer, necessary valves, pressure gauges, drain traps, piping ,fitting etc.

It shall also consist LP compressed air system for meeting requirement of power house normal maintenance, turbine shaft gland and generator brakes. The LP system shall consist of two number AC motor driven air compressors of adequate capacity to cater the above needs of complete power house, will have 2 Nos. air receivers, pressure switches, necessary valves, pressure gauges, drain trap, piping, fitting etc. One separate receiver for generator brake shall also be supplied. All these system are to be installed as per relevant drawings.

4.28 Cooling Water System:

For supplying cooling water to transformer, turbine, generator and power house use, the cooling water shall be tapped from tail race. The system shall comprise of six pump motor sets along with necessary valves, pressure gauges, level controllers, piping, fitting, supports etc.

From this common system cooling water shall be supplied to turbine/generator and transformers of each unit, which shall be erected as per drawings.

4.29 Drainage and Dewatering System:

For complete power house one drainage system for drainage of seepage and leakages in the power house consisting of four submersible pump motor sets and two submersible sludge pump motor sets with necessary valves, pressure gauges, level electrodes, piping, fitting, supports etc. shall be supplied which shall be installed.

Similarly, for dewatering system, for dewatering turbine passage, consisting of Three Nos. V T pump motor sets, necessary number of valves, pressure gauges, level/pressure controllers, piping, fitting, supports etc. shall be supplied which shall be installed as per drawing.

The scope shall include cleaning of equipments like bowel assembly, column pipes, valves, discharge head, motor, testing of valves, installation of pumps, leveling, alignment, locking etc, laying of delivery pipes, installation of valves matching, setting, welding and hydrostatic testing of drainage and dewatering pipes up to tailrace. Installation of air release pipes, installation of man holes on pit , installation of head stock valves, non-return valves, installation of level electrodes / other controls etc. cabling, clamping of pipes anchoring of vertical column pipe complete.

The scope shall also include setting level electrodes.

4.30 Metering Instruments Installations:

Extension of pipes beyond spiral casing and terminating up to the flow meter equipment installed adjacent to barrel including mounting of equipment, welding, cleaning and testing of pipes etc, scope also includes necessary cabling up to the nearby junction box.

4.30.1 Flow Measuring Equipments:

Laying, welding and installation of pipes etc. and mounting of equipment / instruments etc. as per drawing.

4.30.2 Field Efficiency Test:

Cleaning, checking, installation, welding, welds testing and pressure testing and installation of necessary pipes from concrete penstock as well as draft tube and terminating at the connected panels / equipment is included in the scope of work. The scope shall also include conducting the field efficiency test / index test at site on two units as a part of performance guarantee tests. The test arrangement is provided for Unit-3 and 4 only (Or any Two machines as decided by BHEL site in-charge/customer at site).

4.30.3 Chequered plating for oil and CW pipe trenches and hatch covers for openings shall be installed by contractor as per scheme.

Generator:

4.31 **Stator:**

Generator Stator will be supplied in segments, The scope shall cover the leveling/alignment of Stator sectors on temporary support stools, Trial assembly & final assembly of stator Segments/Sectors, Grading and providing of Shims/packing between Sectors steel frame joints & Core joints, measuring and maintaining of Stator core diameter as per drawing & instruction BHEL Engineer's instruction/requirements, testing, laying & fixing off site laid bars/coils with winding RTDs, brazing of site laid bars/coils joints, surface preparation of site joints, Ultrasonic testing of joints, taping & insulation, painting etc. of each sector joints bars/coils, Conductance of electrical tests/ inter-stage/ intermediate stage test/HV test, Final HV test and other electrical tests including Tan Delta test as required to be done at site. Failure, if any, of bars during H.V testing shall be repaired / replaced as directed by BHEL without any charge. The stator winding, being resiflex winding, the joints shall be brazed by gas torch.

The scope shall also cover arranging of test equipments and instruments required for intermediate testing such as H V test of individual bar, ultrasonic test of brazed joints, rectiformer for heating, final HV test of complete stator and stator winding resistance measurement including arranging all necessary arrangements of covering of stator with asbestos /sheeting during dry out etc.. The contractor has to arrange all required test equipments/instruments for above work.

BHEL shall supply following major tools and T & P /equipment:-

a) Stator support stools

b) Tools for winding

4.32 Rotor:

Installation of spider center & arm assembly on rotor stools in service bay, leveling of rim end plates, cleaning and segregation of rim punching, rim building to the required height including intermediate pressing & final pressing to achieve complete rotor rim assembly as per drawing. Cleaning, testing & weighing of poles, assembly of poles on to rim assembly driving of pole keys, Poles to poles & poles to exciter lead winding connections, dry out & HV testing and electrical testing/Impedance & DC resistance test etc. of rotor/poles at all stages & making ready for lowering in position. Any rectification after testing shall also be carried out without any extra cost. The scope also covers installation of connectors, from poles to spider hub including clamping etc.

Assembly of two stators and two rotors is contemplated in service bay simultaneously to meet the erection-commissioning schedule. Contractor should be equipped with complete resources to meet the requirements.

4.33 Generator Shaft:

Cleaning of shaft, coupling flanges, integral thrust collar, proving of coupling bolts, bedding of bearing pads in service bay. Coupling of shaft & rotor spider after lowering of rotor, including driving of keys, locking etc.

4.34 Bottom bracket and Bearings:

The bracket shall be of structural steel with arms, resting on sole plates. The thrust bearing and guide bearing shall be housed in bracket and shall be designed in such a way to permit the shaft coupling flange to pass through it. The bracket shall be designed to permit its removal through the stator bore.

For bearing assembly, thorough cleaning of thrust pads, blue matching of guides pads with bearing journal faces, assembly of bottom bracket center & arm assembly, its lowering on sole plates, leveling & alignment with reference to unit C/ L transferred from stay ring & locking. Assembly of spring mattress & thrust pads before lowering the generator shaft including connected oil piping from H.S lubrication systems. Assembly of oil retaining sleeve, oil vapour seals, bearing

gap setting, assembly & testing of bearing oil coolers with connected oil & water piping including instrumentation like RTD's, DTT's & Thermostat connection.

4.35 Top Bracket:

Cleaning & matching of parts, assembly of centers and arm assemblies, lowering of top bracket assembly on stator, elevation setting leveling & centering , including doweling.

4.35.1 Brush gear casing

Brush gear system with collector ring, brush plates, brushes and DC connections shall be housed in the casing. On tubular shaft collector rings, toothed wheel and over speed device shall be mounted. The stationary items shall be mounted on the casing/ top bracket.

4.35.2 Generator flooring:

Generator top floor plates along with support structure shall be assembled, keeping stools on top bracket/barrel cut out.

4.36 Coolers:

4.36.1 Air coolers - Cleaning, pressure testing, installation of air Coolers to stator frame along with associated piping.

4.36.2 Oil coolers - Cleaning, pressure testing, installation of oil Coolers on bottom bracket along with associated piping.

4.37 BRAKE JACK SYSTEM:

Installation of brake jack panel, over hauling of brake jack unit, cleaning, testing & assembly of air & oil piping from compressed air system up to braking & jacking unit installed on bottom bracket including checking of braking & jacking system & commissioning.

4.38 H.S. Lubrication System:

Cleaning, installation of H.S lubrication unit, piping from H.S. lubrication unit up to sump tank in bottom bracket including the return path & the flexible connections to the thrust pad, checking the system as a whole for performance.

4.39 Brake dust collection equipment:

Installation of brake dust collection equipment for collecting brake dust along with all necessary piping/fitting etc.

4.40 Turbine Pit Air Seal:

Cleaning, marking, matching, drilling, tapping & fixing of pit air seal parts on the bottom bracket assembly to avoid escaping of air from generator barrel through turbine pit.

4.41 Arrangement of Heaters:

Cleaning, testing of heaters before installation, fixing inside the generator barrel, including wiring connection inside the barrel and up to junction box.

4.42 Arrangement of Pit / Barrel Lighting:

Marking & fixing of light / plug points inside the turbine pit (pit liner) & generator barrel (both LEB & Stator) as per drawing. Cleaning, matching installation and doweling & brush gear casing with collector rings, brush holders, plates, brushes of connecting shaft leads & completing DC connections in line with relevant drawings. Installation of dome light & wiring, installation of mechanical over speed device, speed signal generator for speed sensing for governor etc is in the scope of the contractor.

4.43 Cooling System for Generator:

Extension of CW pipes from main header up to inlet of generator bearings, air coolers & oil coolers & from outlet of bearings, air coolers up to tailrace including matching, welding, testing of pipes, installation of flow indicators/ relays, and covering the trenches with chequered plate inside the barrel.

4.44 Pit Access Door:

Cleaning, installation & welding of door frame& installation of pit access door at location such as generator barrel, turbine pit, DT access, including door switches for starting interlocks & wiring up to nearby junction box..

4.45 Marshalling Box:

Installation of generator marshaling boxes in position, cabling from various instruments of generator components, winding RTDs by providing protective/insulated sleeves etc. up to the marshaling boxes & termination & testing; if any.

4.46 Fire Fighting System for Generator:

Installation of steel racks with foundation fixtures for keeping CO2 cylinders, assembly of CO2 cylinders on rack, assembly of valves

manifolds, routing of pipeline, installation of nozzles, pressure switches, smoke detectors, thermostats etc. covering of total system with wire mess arrangement. Making system ready for commissioning.

4.47 Vibration Monitors:

Magnetic pickups to monitor the shaft vibrations & routing of signal cables are required in line with relevant drawings.

4.48 Bus Duct (Segregated) and Terminal Cubical :-

Generator terminals shall be further extended by segregated phase bus-ducts from generator barrel wall and the main step-up transformers. The step –up transformers are located on the draft tube deck at EL 163.00 M. The bus-duct shall run from generator horizontally up to the power house down stream wall and then run vertically over the wall up to the transformer top.
The conductor shall be of aluminium with a non-flammable black coating to increase heat dissipation. All joints and tap connections shall be bolted. Contact surfaces of bolted joints shall be silver plated.

The metal enclosure shall be of aluminium, electrically connected to allow free circulation of currents due to induced voltage. Openings with gasketed covers shall be provided for inspection of insulators.

Erection of complete bus duct from generator to transformer and installation of LAVT/NG cubical shall be in the scope of the contractor.

****** Cabling/wiring for instruments/accessories etc. of turbine, generator and their auxiliaries, up to turbine/generator junction box shall be in the scope of contractor.

****** Cabling/wiring from common system such as DD system, cooling water system, compressed air system etc. for instrumentation and control up to nearby junction box shall be in the scope of contractor.

** Ground earthing: Laying and welding of grounding mats and accessories for power house shall be on the scope of contractor.

4.49 Checks and Site Testing In Respect Of Turbine:

The tests to be conducted at site shall include the following:

4.49.1 During Erection -

1. Inspection of welding of draft liner.
2. Measurement of clearance between shafts & guide bearing & runner & runner envelope.
3. Measurement of guide vane gaps.

4. Checking of shaft alignment.
5. Running test of bearing.
6. Determination of guide vane opening for starting & no load runs.

4.49.2 After the Turbine & associated equipment have been installed & before placing the Unit in service, the following acceptance test shall be carried out.

1. Load rejection test

2. Emergency stop test

3. No load & no excitation run test.

4. Over speed test

5. Turbine output test

6. Continuous operation test

7. Runaway speed test (if desired by owner)

8. Turbine efficiency test /Field Efficiency Test / Index test .

4.49.3 Type Tests-

1. Time rpm de-acceleration curve without excitation on generator from rated speed to standstill.

2. Determination of maximum “Steepest” pitch runaway sped under steady state condition.

3. Emergency intake gate closure with full load on the unit.

4. Guide vane torque measurement during operating load conditions.

4.49.4 Test at site on Generator-

a) Measurement of air gap at no load and full load using the air gap monitoring system to obtain a unit signature.

b) Mechanical run (checking mechanical balance bearing temperature automatic braking etc.)

c) Noise level at 1 m vertically above the upper cover plate of the generator.

d) Measurement of stator and rotor winding insulation resistance.

e) Measurement of stator and rotor winding resistance.

f) Alignment of generator rotor and turbine runner and shaft system.

g) Braking tests of verifying stopping point.

h) Hydro static pressure testing on each surface cooler and bearing cooler.

i) Cooling water requirement tests.

j) Load rejection test at selected load from no load to full load.

k) Moment of inertia of rotating (WR2) parts by retardation method.

l) Oil lift operation test.

m) Quick emergency stop test.

n) Vibration test

o) Temperature rise and output tests.

p) Tan Delta test

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4.50 Pre- commissioning and Acceptance Checks & Tests:

Pre-commissioning/commissioning will involve tests/trial runs of all the equipments individually and in integrated manner.

4.50.1 Checks/tests etc, as above, will have to be repeated as part of work till satisfactory results are obtained. Defects/re-work noticed during such trials/tests etc. shall be attended expeditiously. Certain rectification, modification may be called for as a result of these tests. Contractor's claim, if any, toward such re-works, rectifications, modifications will be dealt with according to provisions of section-13 depending upon the fact whether the same is attributable to the contractor or not.

4.50.2 After trials etc. the bearings of sets may have to be opened for inspection, re-work/re-adjustments, if any, and closure of the bearings shall be done as part of work without any extra compensation.

4.50.3 Contractor shall provide all necessary skilled technicians, Engineers / supervisors, consumables, tools / tackles, plants and MMD's etc, for satisfactory completion of all the activities. It is to be noted that Maheshwar HEP being fast track project, work have to be carried out on round the clock basis. Such contingencies shall be taken in account in the offer by the bidders.

4.51 Loss/Damage to Equipments and Verification:

4.51.1 While taking delivery of material the same shall be inspected for its correctness and for any apparent damage/deterioration/loss during transit/storage. Such instances should forthwith be brought to the notice of BHEL/SMHPCL for further instructions.

4.51.2 BHEL reserves the right to recover from the contractor any losses arising out of undue delay/discrepancy /shortage/damage or any other causes due to contractor's lapses, during any stage of this work.

4.52 Painting:

4.52.1 Preservative Painting:

During all stages of work till final painting and handing over, of the sets to the SMHPCL, preservative painting, including surface cleaning, required to protect any equipments or parts will have to be made by contractor within their quoted rate including all consumables and labor.

4.52.2 Final Painting:

All exposed metal parts of the equipment including piping, structures, railing, tanks/vessels, floor etc. wherever applicable shall be directly painted with two coat of synthetic enamel oil paint of Shalimar/Berger/Asian paints, make on coats of primer over all the equipments, after thoroughly cleaning the surface for dust, rust, scales, grease, oil etc. by wire brushing, scraping as instructed by BHEL site engineer. Wherever the shop coat of primer is pealed off during transportation and erection, affected area shall be first cleaned as described above and painted with two coat of primer and then painted with two coats of final finished paint as described above. The contractor's quoted rates should be inclusive all consumables such as Primers, Paints, wire brush, cleaning agents etc. The colour schemes should be got approved from BHEL / SMHPCL well before the final painting. **The scope also includes finish painting of under water path for which paints shall be supply free of charge by BHEL.**

4.53 Services to Be Rendered:

Contractor shall render the services to the BHEL site office as per the respective item of price bid. These shall meet BHEL's requirement. BHEL reserves the right to avail of these services, either through out the contract period and extension thereof or may cease the same any time as per their requirement.

ANNEXURE

SPECIFICATION FOR SITE OFFICE BUILDING & CLSODED STORAGE SHEDS AND DEVELOPMENT OF OPEN STORAGE YARD TO BE CONSTRUCTED AT SREE MAHESHWAR HYDRO POWER LIMITED

REQUIREMENT

OFFICE-CUM-CLOSED STORE SHED – **1 NO.** As per sketch enclosed
CLOSED SHEDS – 3 Nos.

Overall Size: 40mx10mx5.5m up to the bottom member of roof truss

Roof Truss: **T**ubular/Structural/or combination – To be designed by contractor and approval by BHEL. Roof truss shall be supported on stub RCC (1:2:4) column of min. 1.00m height having either 12mm thick inserts plate with sufficient lugs on the top of column for welding the base plate of truss or 16mm dia. MS bolt-500mm long (4 nos. in each column) with U bent for bolting the truss. Truss will be painted with min. two coats of synthetic enamel

Roof cover and ridge: By AC sheets of Everest make or equivalent with "J"/"L" hooks and rubber washer.

Details of foundation: As per detailed sketch enclosed. Vendor should note that the requirement given in the sketch is minimum & they have to even go for higher size /depth for stability of the building/structures.

Super Structures: Shall be of min. 230mm thick locally available best quality clay burnt bricks with 1:6 cement mortar. Brick wall shall be accompanied with 345mm brick pilasters/column at every 5.00m interval. Adequate curing is necessary for all masonry/ concrete work

Internal finish:

(1) Inner/outer surface of brick masonry wall shall be plastered with min. 12mm thick 1:6 cement mortar. Inside wall of office building (CM's room, Computer room, main hall) shall be painted with min. two coats of OBD of approved colour and external surface shall be painted with Ordinary colour wash.

(2) Office building portion (CM's room, Computer room, main hall) shall have false ceiling with 3mm thick AC plain sheet supported with Aluminum "T" or "L" sections suspended on the truss with 16g GI wire and adjustable "J" hooks. Ceiling shall be painted with min. two coats of lime wash.

(3) Flooring shall be of min. 150mm thick boulder soling of size 63mm down packed either by sand or murrum, followed by 100mm 1:3:6 PCC. Below PCC compacted earth filling shall be done. Finish floor shall be of 40mm thick IPS to be laid in panels of size 2.5mx2.5m with glass strip including curing.

(4) External/ main entrance door shall be of double shutter steel door (35mm thick) of size 1200mmx2100mm. All internal doors shall be of solid core wooden flush door 35mm thick. (900mmx2100mm) with angle/pressed steel frames. Doors shall be fitted with minimum required accessories like eldrops, handles, tower bolts, door stopper etc. & shall be properly lockable. However syntax made PVC door (600mm x 2100mm x 25mm thk.) can be provided for toilet block.

(5) All windows/ventilators shall be steel glazed windows with 4mm thick wired glass. There will be min. one window or ventilator as the case may be (for store) in each span of 5.00m (i.e. in between columns).

(6) In addition to the main entrance door **at least one (01 no.) MS rolling shutter** (size 4.00mx4.50m Ht) mechanically operated is required in each store shed at suitable location including in office-cum-store shed building.

(7) All doors/windows/Rolling shutters shall be painted with two coats of synthetic enamel paints of approved colour.

(8) All main entrance/ rolling shutters shall have RCC ramp with gradual slope for approach/loading, unloading of heavy vehicles.

(9) Plinth of the building shall be min. 450mm above FGL.

(10) There will be minimum one toilet block in office-cum-store shed with 01no. Indian pattern WC, 02 urinals along with necessary plumbing/flushing arrangement. Toilet shall have ceramic tiles on floors and dado over the side of wall of height 1.5m. Suitable Septic tank & soak pit is to be made for 50 users.

(11) Necessary electrification/wiring with power & lighting points with light fittings to be provided for all Office & store sheds. Ceiling fans shall be provided in office room, computer room and hall as per requirement.

OPEN STORAGE YARD:

AREA TO BE DEVELOPED: 150M x 200M

Nature of development: (Work to be carried out)

1. Area dressing, leveling by average cutting /filling of 300mm, watering & compaction with power roller of 8 – 10T capacity to make a reasonably firm ground. Maintaining proper gradient/slope to avoid accumulation of water and drainage of rain water during monsoon.

2. Providing barbed wire fencing with structural gate (main gate) with a provision of small security cabin. Fencing should be adequately strong to safe guard the BHEL equipment & machineries stored in open storage yard.

3. Provision of all weather WBM roads (min. 6.00m wide for main road & 4.00m wide for branch road) inside the store yard dividing the area in various sections/blocks for identification & traceability of materials. All blocks should be approachable through WBM roads for materials handling. Section of WBM shall be min. 230mm bolder soling over prepared sub-base followed by min. 100mm thick WBM with murrum packing with proper watering & compaction with 8 – 10T capacity power roller.

4. Constriction of drains along the roads for drainage of rain water including providing RCC Hume pipes (300mm dia. NP3) at road crossing.

5. Construction of raised platform with PCC (1:3:6) flooring for storage of critical/machined equipments as per requirement (appox. Area 25mx25m.)

6. General illumination of open storage yard including erection of poles, cabling, fittings (halogen lamps) etc. complete

7. **Supply, erection and commissioning of 1 no. 100kVA Transformer for taking input power supply from nearby 11kV line including further distribution to Office-cum-Store shed, closed store shed Open store yard.**

8. Maintenance of open store yard, roads removal of vegetations/ wild grass/ growth etc. through out the contract period.

9. **Supply, erection/Installation and commissioning of 1 no. 500kVA Transformer with all arrangements including Electric Poles, Insulators, Conductor wire/cables, lightening arrestor, Breakers & distribution boards, Metering arrangement etc. at incoming & outgoing terminals all complete as required for taking input power supply from near by 11kV feeder/line of customer and the further distribution of construction power for Power House area/ erection site after following the all due statutory requirements.**

10. **Contractor shall maintain all above arrangements/ installations of taking of Construction Power for Power House area & Storage Yard in fully satisfactory working condition through the contract period & extended period as scope of work. All above electrical installations shall be to fulfill the statutory requirements and approval of concerned State Electrical inspectorate.**

Note:

(1) In case of ambiguity in sketch and specification, the detail mentioned in Specification shall prevail.

(2) The sketch provided is only indicative & for general idea of the bidders. Contractor shall be fully responsible for the stability of building/sheds till completion of project.

(3) Contractor has to demolish the office & sheds after completion of work; remove all the debris and hand over the land to customer.

(4) All retrievable/ salvageable materials after demolition shall be the contractor's property including transformer, cables, fitting etc. provided by contractor & shall be taken out.

(5) Entire work is to be carried out as per the instruction and supervision of BHEL Engineer at site. BHEL's decision shall be final & biding in all respect.

Section-5

Special Conditions

5.0 Obligations of the Contractor

5.1 Labour Colony

Contractor shall make his own arrangement for construction of labour colony, including the land, water and electricity. BHEL / SMHPCL shall not provide any facility in this regard.

5.2 Staff colony

Contractor has to make their own arrangements for accommodation of their staff at site. BHEL / SMHPCL shall not provide any facility in this regard.

5.3 Tools and Tackles

5.3.1 All the tools and plants, tackles, transport, handling equipments, hand tools, calibrated measuring instruments, test equipments etc. whether specifically stated in these specifications or not, for satisfactory completion of this work shall be in the contractor's scope. BHEL will provide only those T&Ps, which are specifically supplied for erection use.

5.3.2 Where required, tools and tackles to be used for the work shall have the prior approval of BHEL engineer in regard to quality and specification.

5.3.3 The bidders are requested to note that the tools and tackles and equipments, which will be made available by BHEL free of hire charges on loan basis, are detailed elsewhere in these specifications. It is the responsibility of the contractor to keep these equipments always in working condition and ensure their safe return in working condition to BHEL stores after completion of the job subject to normal wear and tear.

5.3.4 The contractor shall provide all the necessary scaffolding materials, temporary structures and necessary safety devices etc. during pre-assembly, erection, testing and commissioning of the hydro sets.

5.3.5 Contractor should be able to augment any special T&Ps at short notice to match the planned programmes and to achieve the milestone events.

5.3.6 Contractor shall maintain and operate his tools and plants in such a way that major breakdowns are avoided. In the event of major

breakdown, contractor shall make alternate arrangements expeditiously, so that the progress of work is not hampered.

5.3.7 In the event of contractor failing to arrange the required tools, plants, machinery, equipment, material and non-availability of the same causing work suffering, BHEL shall have right to make alternate arrangement at the contractor's risk and cost.

5.3.8 The T&P to be arranged by the contractor shall be in proper working condition. The operation shall not lead to unsafe conditions. The movements of cranes and other equipment should be such that no damage/breakage occurs to foundation, equipment, material and men.

5.3.9 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, and other construction equipment shall be arranged by the contractor under scope of this work.

5.3.10 The contractor at his cost will carry out periodical testing of lifting equipments and calibration of measuring instruments and certificates produced for the same to BHEL, before their use. Periodicity shall be as per BHEL's requirement.

5.3.11 Contractor shall provide T&P, tackles and mobile cranes for unloading / loading of materials at BHEL stores/shed/yard and transport for shifting the materials to site under the scope of this work. As far as possible EOT crane will be available to the contractor for unloading of the materials required for erection and commissioning related activities in the power house. Where & when required in the event of EOT crane not being available due to any reasons, the contractor shall use his crane/make arrangement for unloading of materials at site.

5.3.12 Wooden sleepers etc required for stacking of materials at Store /store yard / site shall be arranged by the contractor.

5.3.13 The contractor shall provide portable fire extinguisher at site Office, storage sheds and at all important points where work is in progress.

5.3.14 Contractor shall not sub-let any part of the work to other party.

5.4 Consumables:-

5.4.1 The contractor shall provide all consumables required for carrying out the work covered under this scope of work excepting those which are specifically indicated as BHEL supply.

5.4.2 Wherever required consumables to be used for the work shall have prior approval of BHEL engineer in regard to quality specifications.

5.5 Welding Electrodes And Gases:-

5.5.1 The special welding electrodes required for draft tube liner, DT cone, stay ring and pit liner welding and stainless steel welding electrodes for the runner envelope shall be supplied along with the main generating units by BHEL. For other works, contractor has to arrange welding electrodes as part under this scope of work. It shall be the responsibility of the contractor to obtain prior approval of BHEL, before procurement of the electrodes for other work, regarding suppliers, type of electrodes etc. On receipt of the electrodes at site, it shall be subject to inspection and approval by BHEL. Details regarding type of electrodes, batch number and date of expiry etc. copy of manufacturer's test certificate shall be furnished to BHEL.

BHEL reserves the right to reject the use of any electrodes at any stage, if found defective because of bad quality, improper storage, date expiry, unapproved type of electrodes etc. It shall be the responsibility of the contractor to submit weekly/fortnightly/monthly statement / report regarding consumption of electrodes of all types for cost analysis purpose.

The contractor shall maintain and submit periodically the account of special electrodes issued to him. Wastage of electrodes, if any, shall be recovered from the contractor.

5.5.2 All the required gases like argon, oxygen, acetylene, gas and chemicals for acid cleaning, oil for flushing of oil pipe lines, consumables like grinding wheels, rotary cutters, metallic locktite, cotton waste, cloth etc. to name a few, contractor shall asses the exact requirement of consumables and the same will be provided by the contractor at his cost.

5.5.3.1 If at any time during the execution of work, it is noticed that the work is suffering on account of shortage/non-availability of consumables from the contractor's side like electrodes, gases and other consumables, then, BHEL will make alternate arrangements and the necessary costs with overheads at 30% will be recovered from the running bills of the contractor.

5.6 Field Office And Stores

5.6.1 The contractor shall make his own arrangements for field office with necessary equipments, tools room, clerical staff, and storekeeper etc. for the execution of the work.

5.6.2 On completion of work, all the temporary buildings, structures, pipelines, fittings, transformers, DG set, cables, T&P etc. arranged by contractor, shall be removed by them at his cost. In the event of his failure to do so, the same will be arranged by BHEL at the cost and risk of contractor. Contractor will be allowed to take back all these material arranged by the contractor for the execution of the work under this contract.

5.7 Construction Power, Lighting and water

5.7.1 Construction Power :-

SMHPCL shall provide construction power supply free of charge from 11 KV feeders. Contractor has to take tapping from 11 KV feeders (app. ½ km from PH), for which they have to arrange 1 No. 11 KV/440V / 500KVA transformer and lay the line for construction power supply up to the Power house. All necessary arrangements including poles, transmission line, cables, distribution boards in power house etc. are to be arranged by the contractor and same shall be maintained by the contractor in fully safe and satisfactory working condition, throughout the contract period and extended period, if any.

Construction power under above shall also be shared with other BHEL's contractor at site. Contractor shall allot / spare one power point from distribution board to that contractor**.**

5.7.1.1.1 Maheshwar HEP being fast track project, the contractor has to arrange **one No. diesel-generating set of 100 KVA** capacity, along with all necessary cables/arrangements etc for construction power supply, at his own cost ,so work progresses without any interruption at the time of power failure. Fuel / operator and maintenance etc. for operating DG set shall be in the contractor's scope.

Contractor is required to arrange construction power as stated above within a month from the date of receipt of the order.

5.7.1.1.2 Distribution of power supply to the work points of all the ten Units, erection bay, EOT cranes etc. and maintenance of such electrical system is covered in the scope of contractor.

5.7.2 Lighting:-

5.7.2.1 The contractor at his cost should arrange for temporary lighting, besides the local lighting arrangement, that may be required for the execution of the work. Contractor shall arrange adequate floodlights, hand lamps and area lighting

5.7.2.2 All temporary wiring & installations for construction power & lighting must comply with local regulations and will be subjected to BHEL engineer's inspection and approval before connecting to supply point.

5.7.2.3 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.

5.7.3 Water & Compressed Air:-

Water for construction shall be arranged by contractor from the nearby source / river by installing suitable pumps and temporary piping etc. Contractor has to make his own arrangement for air compressor for their work.

5.7.4 Planning:-

It shall be the responsibility of the contractor to ascertain and verify the availability of material for forth-coming activities, one month in advance and intimate without failure, shortages if any; to BHEL for appropriate action.

5.8 Responsibilities of the Contractor in respect of the local law and employment of workers etc:-

5.8.1 Contractor shall adhere to the responsibilities stated vide clause no. 2.8 of general conditions of contract**.**

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 goods & 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 (Sales Tax /WCT)

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

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 Insurance:-

5.10.1 BHEL shall arrange for the comprehensive insurance covering all risks including third party liability and damage/loss occurring during the internal transport, but such loss/damage is limited to only the consignments transported.

The contractor has to arrange on his own, insurance for their T&P and other fixed assets, which he may have to acquire and deploy at site. It is also the responsibility of the contractor to arrange for accident risk policy/workmen compensation policy.

The contractor has to provide all assistance in processing the insurance claims covered by the said comprehensive insurance policy that is taken by BHEL.

Please refer relevant clauses of GCC .for contractor's responsibility in this regard.

5.10.2. The contractor should satisfy BHEL that an accident insurance policy of their employees is taken before starting of the works and the policy is kept in force till the work is completed. If required, recoveries will be made from the contractor's bill for any liabilities for the accident and refund of the same shall be considered later after the claim is fully settled by insurance authorities.

5.10.3 ESIC :-

Contractor shall adhere to and comply with the relevant ESIC act as applicable to the site of work.

5.10 Statutory Inspections/ Approvals:-

Contractor shall be responsible for the necessary periodic testing and inspection during erection and commissioning of BHEL equipments and shall carry out the work to meet the specific requirement of the relevant statutory authority. However, all fees, charges etc, payable to the statutory authorities shall be borne by BHEL.

However, contractor shall be responsible for paying all fees, making arrangements for their visit etc, towards their equipments / qualification of his workmen, on account of their carrying out this work.

Section-6

Special Conditions

Contractor's Obligation in regard to employment of Supervisory Staff and Workmen

6.1 Supervisory Staff And Labour :-

The contractor shall deploy on this work only the fully trained and competent men with previous experience on the similar job. They shall hold valid certificates wherever necessary. BHEL reserves the right to decide on the suitability of the workers and other personnel who will be employed by the contractor. 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 immediately. Contractor should furnish a tentative deployment plan of his manpower as requested vide Appendix-vi. The actual deployment will be so as to satisfy the erection and commissioning targets set by BHEL/SMHPCL.

6.2 If at any time, it is found that the contractor is not in a position to deploy the required workmen due to any reason / or not in position to execute the work as per BHEL requirement ; BHEL shall have the option to make alternate arrangements for carrying out the work, at the contractor's risk and cost.

6.3 It is the responsibility of the contractor to engage his workmen in shifts / to the extent of round the clock working, working on Sundays and holidays for achieving the target set by BHEL. This target may be set to suit BHEL's commitments to its customer SMHPCL or to advance date of completion of events or due to other reasons. The decision of BHEL in regard to setting the targets will be final and binding on the contractor.

6.4 Contractor shall deploy only engineers / supervisors for this job having adequate knowledge and experience in the similar fields of erection, erection methodology, welding, NDT procedures, quality control and quality assurance procedures, planning, safety etc. required for undertaking the type of work as per this tender. They shall have professional approach in executing the work

6.5 The contractor in all areas of work shall provide adequate staffing especially the following:

A) Overall coordination and execution
B) NDT procedure, quality control & quality assurance
C) Materials management.

D) Planning
E) Safety
F) Industrial Relations and Implementation of Labour Laws.

6.6 Contractor shall give an organisation chart indicating the staffing pattern for the above functions. The above areas are indicated for guidance and if any area needs extra attention during execution of work, contractor shall post engineers/supervisors accordingly as per instruction of BHEL.

6.7 The contractor's supervisory staff shall execute the work in the most substantial and workmanlike 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 and instructions given by BHEL engineer from time to time.

They shall ensure proper out turn of work and discipline on the part of the labour put on the job and 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.

6.8 Watch & Ward:-

Contractor has to arrange and provide watch & ward round the clock for the material issued to them and their own equipments, instrument etc. at site. Any loss of BHEL material shall be on account the contractor.

Section-7

Special Conditions

7.0 Obligations of BHEL

7.1 Facilities Provided By BHEL

7.1.1 Space

Refer section 5 in this regard.

7.2 Welding Electrodes & Test plates etc

7.2.1 The special welding electrodes required for DT liner, DT cone, Stay ring and pit liner welding and stainless steel welding electrodes for the runner envelope welding shall be supplied along with the main generating units by BHEL. For all other purposes the welding electrodes shall be arranged by the contractor under this scope.

7.2.2 Plates and pipes/tubes required for testing of welders will be provided by BHEL free of cost. The edge preparation and machining charges are to be borne by the contractor.

7.3 Equipment – tools:-

7.3.1 BHEL will make available only the T&Ps as indicated in Appendix-II

7.3.2 All tools / tackles which are supplied by BHEL manufacturing units as part of tools/ tackles for erection work under regular packages in various product groups will be spared free to contractor and contractor shall return them after the completion of the specific work, for which the tools were spared, in good working order.

7.3.3 The contractor must not use these items for purposes other than erection work. Misuse, if any, will result in penalty.

7.3.4 BHEL engineer will inspect all the above items issued to contractor periodically. In case contractor fails to make good the damages caused, BHEL will do the same at contractor's cost.

SECTION-8

SPECIAL CONDITIONS OF CONTRACT

8.0 INSPECTION / QUALITY ASSURANCE / STATUTORY INSPECTION

8.1

VARIOUS INSPECTION / QUALITY ASSURANCE PROCEDURES / METHODS AT VARIOUS STAGES OF ERECTION AND COMMISSIONING WILL BE AS PER BHEL / CUSTOMER QUALITY PLANS / 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/ CONSULTANTS/STATUTORY AUTHORITY, WELDING LOGS, NDE AND POST WELD HEAT TREATMENT RECORDS, TESTING & CALIBRATION RECORDS AND OTHER QUALITY ASSURANCE DOCUMENTATION AS PER BHEL ENGINEER'S INSTRUCTIONS, IS WITHIN THE SCOPE OF WORK/SPECIFICATION. THESE RECORDS SHALL BE SUBMITTED TO BHEL/CUSTOMER FOR APPROVAL FROM TIME TO TIME.

8.3

A DAILY LOGBOOK OF ALL MEASUREMENTS AND TESTING/CALIBRATION SHOULD BE MAINTAINED BY CONTRACTOR ON THE JOB FOR DETAILING INSPECTION DETAILS OF VARIOUS EQUIPMENTS.

8.4

THE PERFORMANCE OF HP WELDERS WILL BE REVIEWED FROM TIME TO TIME AS PER THE BHEL/IBR STANDARDS. HIGH PRESSURE WELDERS' PERFORMANCE RECORD SHALL BE FURNISHED PERIODICALLY. CORRECTIVE ACTION AS INFORMED BY BHEL SHALL BE TAKEN IN RESPECT OF THOSE WELDERS NOT CONFORMING TO THESE STANDARDS. THIS MAY INCLUDE REMOVAL/ DISCONTINUANCE OF CONCERNED WELDER(S). CONTRACTOR SHALL ARRANGE FOR THE ALTERNATE WELDERS IMMEDIATELY.

8.5

ALL THE WELDERS INCLUDING HP WELDERS SHALL CARRY IDENTITY CARDS AS PER THE PROFORMA PRESCRIBED BY BHEL ONLY WELDERS DULY 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 THE WORK SATISFACTORILY. THESE MMDS SHALL CONFORM TO JOB REQUIREMENT IN RESPECT OF MEASUREMENT RANGE, ACCURACY LEVEL & ANY OTHER SPECIFICATION.

8.7

THE MMD DEPLOYED BY THE CONTRACTOR SHALL, AT ALL STAGES OF WORK, HAVE VALID AND CURRENT CALIBRATION CERTIFICATE. THE CALIBRATION OF THESE MMDS SHALL BE GOT DONE FROM THE AGENCIES ACCREDITED/ APPROVED BY BHEL/EIL. COPY OF CALIBRATION CERTIFICATES 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 SPECIFICATIONS OF BHEL REGARDING STORAGE OF THE MMD.

8.8
RE-WORK NECESSITATED ON ACCOUNT OF USE 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 FOR THE LOSS OF TIME.
8.9
IN THE COURSE OF WORK BHEL MAY COUNTER/ FINALLY CHECK THE MEASUREMENTS WITH THEIR OWN MMDS. CONTRACTOR SHALL RENDER ALL ASSISTANCE IN CONDUCT OF SUCH COUNTER CHECK / FINAL MEASUREMENTS.

8.10
VIBRATION INDICATORS/VIBRATION RECORDERS/VIBRATION ANALYSERS WILL BE PROVIDED BY BHEL FOR CHECKING AND ANALYSING VIBRATION LEVELS OF ROTATING EQUIPMENTS WITH QUALIFIED OPERATORS. CONTRACTOR SHALL PROVIDED NECESSARY MANPOWER FOR CARRYING OUT SUCH TESTS. SIMILARLY, BHEL WILL PROVIDE THE OSCILLOSCOPE FOR ANY SPECIFIC REQUIREMENT.

8.11
TOTAL QUALITY IS THE WATCHWORD OF THE WORK AND CONTRACTOR SHALL STRIVE TO ACHIEVE THE QUALITY STANDARDS, PROCEDURES LAID DOWN BY BHEL. HE SHALL FOLLOW ALL THE INSTRUCTIONS AS PER BHEL DRAWINGS AND QUALITY STANDARDS. CONTRACTOR SHOULD ENGAGE WELL-QUALIFIED AND EXPERIENCED ENGINEER FOR QUALITY ASSURANCE AND NDT SERVICES.

8.12 STAGE INSPECTION BY FES / QA ENGINEERS

8.12.1
APART FROM DAY-TO-DAY INSPECTION BY BHEL ENGINEERS STATIONED AT SITE AND ALSO BY CUSTOMER'S ENGINEERS, STAGE INSPECTION OF EQUIPMENTS UNDER ERECTION AND COMMISSIONING AT VARIOUS STAGES OF ERECTION AND COMMISSIONING BY TEAMS OF ENGINEERS FROM FIELD ENGINEERING SERVICES OF BHEL'S MANUFACTURING UNITS AND QUALITY ASSURANCE TEAMS FROM FIELD QUALITY ASSURANCE, FACTORY QUALITY ASSURANCE AND COMMISSIONING ENGINEERS FROM TECHNICAL SERVICES OF BHEL / CONSULTANT WILL ALSO BE CONDUCTED. CONTRACTOR SHALL ARRANGE ALL LABOUR, TOOLS AND TACKLES ETC FOR SUCH STAGE INSPECTIONS AS PART OF WORK.

8.13 STATUTORY INSPECTION OF WORK

8.13.1
THE WORK TO BE EXECUTED UNDER THESE SPECIFICATIONS HAS TO BE OFFERED FOR INSPECTION, AT APPROPRIATE STAGES OF WORK TO STATUTORY AUTHORITIES TO COMPLY WITH APPLICABLE REGULATIONS.
8.13.2
THE WORK RELATED STATUTORY INSPECTIONS, THOUGH NOT LIMITED TO, ARE AS UNDER:

1) INSPECTORATE OF STEAM BOILERS AND SMOKE NUISANCE
2) FACTORY INSPECTOR, LABOUR COMMISSIONER, ELECTRICAL INSPECTOR PF COMMISSIONER AND OTHER AUTHORITIY CONNECTED TO THIS PROJECT WORK

THE SCOPE INCLUDES GETTING THE APPROVALS FROM THE STATUTORY AUTHORITIES, WHICH INCLUDES ARRANGING FOR INSPECTION VISITS OF STATUTORY AUTHORITY

PERIODICALLY AS PER BHEL ENGINEER'S INSTRUCTIONS, ARRANGING MATERIALS FOR GROUND INSPECTION, TAKING RUB OUTS FOR THE PRESSURE PARTS TO BE OFFERED FOR INSPECTION, SUBMITTING CO-RELATED INSPECTION REPORTS, DOCUMENTS, RADIOGRAPHS 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.

8.13.3

THE CONTRACTORS SHALL PAY ALL FEES CONNECTED WITH TESTING OF HIS WELDERS / WORKERS AND TESTING, INSPECTION & CALIBRATION OF HIS MMD AND T&P.

8.13.4

IT SHALL BE CONTRACTOR'S RESPONSIBILITY TO OBTAIN APPROVAL OF STATUTORY AUTHORITIES, WHENEVER APPLICABLE, FOR THE CONDUCTING OF ANY WORK WHICH COMES UNDER THE PURVIEW OF THESE AUTHORITIES. ANY COST ARISING FROM THIS SHALL BE CONTRACTOR'S ACCOUNT.

8.13.5

CONTRACTOR SHALL PAY FEES FOR VISITS, INSPECTION FEES ETC OF IBR AUTHORITIES IN ADDITION TO ALL OTHER EXPENSES IN THIS REGARD.

8.13.6

CONTRACTOR SHOULD BE QUALIFIED TO EXECUTE PRESSURE PARTS & PIPING WORK COMING UNDER THE PURVIEW OF IBR, FOR WHICH HE SHOULD REGISTER HIMSELF WITH CIB OF STATE CONCERNED. CONTRACTOR ALSO SHOULD BE AWARE OF THE LATEST IBR REGULATIONS AND ELECTRICITY ACT, INCLUDING THE AMENDMENTS THEREOF.

8.14.0

THE QUALITY MANAGEMENT SYSTEM OF BHEL, POWER SECTOR – WESTERN REGION (PSWR) HAS ALREADY BEEN CERTIFIED AND ACCREDITED UNDER ISO 9001: 2000 STANDARDS IN THIS REGARD. THE BASIC PHILOSOPHY OF THE QUALITY MANAGEMENT SYSTEM IS TO DEFINE THE ORGANIZATIONAL RESPONSIBILITY, WORK AS PER DOCUMENTED PROCEDURES, VERIFY THE OUTPUT WITH RESPECT TO ACCEPTANCE NORMS, IDENTIFY THE NON-CONFORMING PRODUCT/ PROCEDURE AND TAKE CORRECTIVE ACTION FOR REMOVAL OF NON-CONFORMANCE SPECIFYING THE STEPS FOR AVOIDING RECURRENCE OF SUCH NON-CONFORMITIES, & MAINTAIN THE RELEVANT QUALITY RECORDS. THE NON-CONFORMITIES ARE TO BE IDENTIFIED THROUGH THE CONDUCT OF PERIODICAL AUDIT OF IMPLEMENTATION OF QUALITY SYSTEMS AT VARIOUS LOCATIONS/STAGES OF WORK. SUPPLIERS/VENDORS OF VARIOUS PRODUCTS/SERVICES CONTRIBUTING IN THE WORK ARE ALSO CONSIDERED AS PART OF THE QUALITY MANAGEMENT SYSTEM. AS SUCH THE CONTRACTOR IS EXPECTED NOT ONLY TO CONFORM TO THE QUALITY MANAGEMENT SYSTEM OF BHEL BUT ALSO IT IS DESIRABLE THAT THEY THEMSELVES ARE ACCREDITED UNDER ANY QUALITY MANAGEMENT SYSTEM STANDARD.

Section-9

Special Conditions

Safety, Occupational Health and Environmental Management

Introduction:-

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

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 sign board giving the following information and display it near the 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 PPEs 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 guard rails, 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 Cylinder 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 contractor as per statutory requirements shall compensate the victim and/or his/her dependents. 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 neighboring
- Protect environment
- Resumption of normal operations as soon as the emergency condition is called off

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

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

9.2.2.5
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 good house keeping and if there is an imminent risk of pollution

9.2.4ENVIRONMENT MANAGEMENT

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

9.2.4.2 WASTE MANAGEMENT

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

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

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

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

9.2.4.3.5
Acid and alkali cleaning wastes shall be neutralised 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 authorised 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, documentation, to cover the following aspects.

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

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

The contractor shall take remedial measures as per the findings of each inspection

Besides the above, the contractor shall be required to carry out the following inspections

Sl no	Equipment	Scope of inspection	Inspection by	Schedule
1	Hand tools	To identify unsafe/defective tool	User	Daily
2	Power tools	To identify unsafe/defective tool	User	Daily
3	Fire Extinguishers	To check pressure and any defect	User / Safety Coordinator	Daily Every month
4	Lifting equipment/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.	Safety	Fine (in Rs)
01	Not Wearing Safety Helmet	50/-
02.	Not wearing Safety Belt	100/-
03.	Grinding Without Goggles	50/-
04.	Not using 24 V Supply For Internal Work	500/-
05.	Electrical Plugs Not used for hand Machine	100/-
06.	Not Slinging property	200/-
07.	Using Damaged Sling	200/-
08.	Lifting Cylinders Without Cage	500/-
09.	Not Using Proper Welding Cable With Lot of Joints And Not Insulated Property.	200/-
10.	Not Removing Small Scrap From Platforms	200/-
11.	Gas Cutting Without Taking Proper Precaution or Not Using Sheet Below Gas Cutting	200/-
12.	Not Maintaining Electric Winches Which are Operated Dangerously	500/-
13.	Improper Earthing Of Electrical T&Ps	500/-
14.	Accident resulting in partial loss in earning capacity	25000/- per victim
15.	Fatal accident / accident resulting in total	100000/-

	loss in earning capacity	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 recognise 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:

6 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	And upto	*6.9.2.1.1 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 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 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 tenderness, general conditions of contract contained in sections 1 & 2 respectively and special conditions of contract contained in sections 4 to 15 and appendices, provisions contained in special conditions of con t in sections 4 to 15 and appendices shall prevail.

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

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

SECTION-11

SPECIAL CONDITIONS OF CONTRACT

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

11.1 MOBILIZATION, TIME SCHEDULE, CONTRACT PERIOD AND GRACE PERIOD

11.1.1 INITIAL MOBILIZATION FOR MATERIAL HANDLING AND MM SERVICES , E & C ACTIVITY , INFRASTRUCTIRE WORK ETC COMPLETE

CONTRACTOR SHALL MOBILIZE NECESSARY RESOURCES WITHIN SHORTEST POSSIBLE TIME OF TWO WEEK FROM DATE OF ISSUE OF FAX LETTER OF INTENT TO COMMENCE THE MATERIAL HANDLING AND VARIOUS MATERIALS MANAGEMENT SERVICES, , E & C ACTIVITY , INFRASTRUCTIRE WORK. SUCH RESOURCES SHALL BE PROGRESSIVELY AUGMENTED TO MATCH THE FLOW OF MATERIALS FROM BHEL MANUFACTURING UNIT AND START OF WORK AS PER THIS TENDER

11.1.2 MOBILIZATION FOR ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING ETC.

THE ACTIVITIES FOR ERECTION, TESTING ETC. SHALL BE STARTED AS PER DIRECTIONS OF CONSTRUCTION MANAGER OF BHEL. CONTRACTOR SHALL MOBILISE FURTHER RESOURCES (IN ADDITION TO THOSE REQUIRED FOR ACTIVITIES UNDER CLAUSE No. 11.1.1) AS PER REQUIREMENT TO COMMENCE THE WORK OF ERECTION, TESTING ETC. OF BOILER AND AUXILIARIES AND PROGRESSIVELY AUGMENT THE RESOURCES TO MATCH SCHEDULE OF THE PROJECT.

11.1.3 COMMENCEMENT OF CONTRACT PERIOD AND TENTATIVE SCHEDULE

ERECTION/PLACEMENT ON IT'S DESIGNATED FOUNDATION/LOCATION, OF THE FIRST MAJOR PERMANENT EQUIPMENT/COMPONENT/COLUMN COVERED IN THE SCOPE OF THESE SPECIFICATIONS SHALL BE RECOGNIZED AS "START OF CONTRACT PERIOD". SMALLER ITEMS LIKE PACKER PLATES, SHIMS, ANCHORS, INSERTS ETC. WILL NOT BE CONSIDERED AS START OF CONTRACT PERIOD.

THE CONTRACTOR HAS TO SUBSEQUENTLY AUGMENT HIS RESOURCES IN SUCH A MANNER THAT FOLLOWING MAJOR MILESTONES OF ERECTION & COMMISSION ARE ACHIEVED ON SPECIFIED SCHEDULES:

The commissioning schedule for all ten units is as below:-

UNIT NO.	SHEDULE DATE OF COMMG.
1	25/03/2010
2	10/05/2010
3	25/06/2010
4	10/08/2010
5	25/09/2010

6	10/11/2010
7	25/12/2010
8	25/01/2011
9	25/02/2011
10	25/03/2011

* The above schedule may be advanced to meet the commitment of BHEL to SMHPCL, for which no additional payment shall be made by BHEL to the contractor. The

IN ORDER TO MEET ABOVE SCHEDULE IN GENERAL, AND ANY OTHER INTERMEDIATE TARGETS SET, TO MEET CUSTOMER/PROJECT SCHEDULE REQUIREMENTS, CONTRACTOR SHALL ARRANGE & AUGMENT ALL NECESSARY RESOURCES FROM TIME TO TIME ON THE INSTRUCTIONS OF BHEL.

11.1.2 **CONTRACT PERIOD**

THE CONTRACT PERIOD FOR COMPLETION OF ENTIRE WORK UNDER SCOPE SHALL BE **37 (THIRTY SEVEN) MONTHS** FROM THE "START OF CONTRACT PERIOD" AS SPECIFIED EARLIER.

THE PERIOD FROM THE COMMENCEMENT OF MATERIAL HANDLING & MANAGEMENT AND/OR PREPARATORY WORK FOR ERECTION TILL THE ACTURAL "START OF CONTRACT PERIOD" SHALL NOT BE RECKONED FOR THE ABOVE PURPOSE.

11.1.3 **GRACE PERIOD**

GRACE PERIOD OF **7 (SEVEN) MONTHS** BEYOND THE CONTRACT PERIOD OF 37 (THIRTY SEVEN) MONTHS MAY BE PROVIDED FOR THIS CONTRACT AT THE DISCRETION OF BHEL.

11.1.4 CONSEQUENCE OF DELAY

IT MAY BE NOTED THAT IN THE EVENT DELAY IN COMPLETION IS ATTRIBUTABLE TO THE CONTRACTOR AND LEADS TO IMPOSITION OF LIQUIDATED DAMAGES BY BHEL'S CLIENT, BHEL WILL IMPOSE LD ON THE CONTRACTOR AS PER GCC.

11.2 PROGRESS MONITORING, CONTRACT EXTENSION AND OVERRUN

11.2.1 PROGRESS MONITORING

PROGRESS WILL BE REVIEWED PERIODICALLY (DAILY/WEEKLY/MONTHLY) INCLUDING MONTH END REVIEW VIS-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 CAUSES 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 CL. 11.2.1 ABOVE WILL BE MADE CONSIDERING THE AVAILABILITY OF COMPONENTS TO BE ERECTED AND OTHER INPUTS / CONSTRAINTS OVER WHICH THE CONTRACTOR HAS NO CONTROL. THE PROGRAMME WILL BE REVIEWED AREA-WISE AND THE FOLLOWING FACTS WILL BE RECORDED IN CASE OF SHORTFALL AT THE END OF EVERY MONTH:

A) ERECTION / COMMISSIONING PROGRAMME NOT ACHIEVED OWING TO NON-AVAILABILITY OF FRONTS.

B) ERECTION / COMMISSIONING PROGRAMME NOT ACHIEVED OWING TO NON-AVAILABILITY OF MATERIALS.

C) ERECTION/COMMISSIONING PROGRAMME NOT ACHIEVED OWING TO NON-AVAILABILITY OF TOOLS AND PLANTS, MANPOWER AND CONSUMABLES BY THE CONTRACTOR OR ANY OTHER REASON ATTRIBUTABLE TO THE CONTRACTOR.

D) ERECTION / COMMISSIONING PROGRAMME NOT ACHIEVED DUE TO ANY OTHER REASONS NOT ATTRIBUTABLE TO THE CONTRACTOR.

11.2.3 CONTRACT EXTENSION

IF THE COMPLETION OF WORK AS DETAILED IN THESE SPECIFICATION GETS DELAYED BEYOND THE END OF CONTRACT PERIOD AND GRACE PERIOD THEN DEPENDING ON THE BALANCE WORK LEFT OUT, BHEL AT ITS DISCRETION MAY EXTEND THE CONTRACT.

11.2.4
A JOINT PROGRAMME SHALL BE DRAWN FOR THE WORK TO BE COMPLETED DURING THE EXTENDED CONTRACT PERIOD. REVIEW OF THE PROGRAM AND RECORD OF SHORTFALL AS DESCRIBE VIDE CLAUSE NO. 11.2.2 SHALL BE DONE DURING THE EXTENDED PERIOD. THE OVER RUN CHARGES WILL BE PAID IN PROPORTION TO THE ACHIEVEMENT OF THE RESPECTIVE MONTH VIS-À-VIS THE PLAN FOR THE MONTH (FOR ASSESSING THE PERFORMANCE, THE AGREED PLAN SHALL BE REDUCED BY SHORTFALL ATTRIBUTABLE TO THE BHEL). BHEL MAY DISALLOW CONTRACTOR'S CLAIM FOR OVER RUN CHARGES IF THE MONTHLY PROGRAMME AS MENTIONED IN THESE SPECIFICATIONS ARE NOT MADE BY HIM.

11.2.5
THE PART OF EXTENSION ATTRIBUTABLE TO THE CONTRACTOR, IF ANY, IN TOTAL CONTRACT EXTENSION SHALL BE EXHAUSTED FIRST i.e., IMMEDIATELY AFTER END OF GRACE PERIOD. THIS SHALL BE FOLLOWED BY THE EXTENSION ON ACCOUNT OF FORCE MAJEURE CONDITIONS, IF ANY, AND LASTLY ON ACCOUNT OF BHEL.

11.2.6 OVERRUN COMPENSATION

IF THE CONTRACT IS EXTENDED BEYOND THE CONTRACT AND GRACE PERIOD FOR ANY REASON OTHER THAN THOSE ATTRIBUTABLE TO THE CONTRACTOR OR FORCE MAJEURE CONDITIONS, THE CONTRACTOR WILL BE COMPENSATED BY PAYMENT OF OVERRUN CHARGES AT THE RATE OF RS.1,00,000/- (RUPEES ONE LAKH ONLY) PER MONTH. OVERRUN COMPENSATION WILL BE PAID FOR THE EXTENSION ATTRIBUTABLE TO BHEL ONLY. **NO OVERRUN COMPENSATION SHALL BE PAYABLE FOR THE EXTENSION OF CONTRACT ON ACCOUNT OF MATERIAL HANDLING/MATERIAL MANAGEMENT, REASONS OF DELAY OF ERECTION & COMMNG. WORKS ATTRIBUTABLE TO CONTRACTOR AND/OR FORCE MAJEURE CONDITIONS**. OVERRUN COMPENSATION FOR ELIGIBLE PERIOD SHALL BE IN PROPORTION TO THE PROGRESS ACHIEVED AGAINST THE PLAN FOR RESPECTIVE PERIOD.

11.3 PRICE VARIATION

AGREED ITEM RATES OR RATE SCHEDULE SHALL REMAIN FIRM THROUGHOUT THE CONTRACT PERIOD AND EXTENSIONS THEREOF. NO PRICE VARIATION/ADJUSTMENT SHALL BE APPLICABLE FOR THIS CONTRACT. Accordingly the clause no. 2.15 of general conditions of contract section-2 is not applicable.

11.4 CONTRACT VARIATIONS

11.4.1 VARIATION IN WEIGHT/QUANTITIES

WEIGHT OF VARIOUS EQUIPMENTS, QUANTITIES OF VARIOUS ITEMS OF WORK COVERED UNDER THESE SPECIFICATIONS AND INDICATED IN RELEVANT APPENDICES FOR ERECTION & COMMISSIOING AND MATERIAL HANDLING/MATERIAL MANAGEMENT SERVICES ARE LIKELY TO VARY. FOR ANY UPWARD OR DOWNWARD VARIATION IN THE QUANTITIES, THE RATES ACCEPTED SHALL BE APPLICABLE WITHOUT ANY VARIATION. PAYMENT WILL BE MADE BY BHEL FOR THE ACTUAL EXECUTED QUANTITY OF RESPECTIVE ITEM AS CERTIFIED BY BHEL ENGINEERS.

FOR THE PURPOSE OF PAYMENT FOR MATERIAL HANDLING AND MATERIAL MANAGEMENT SERVICES, GROSS WEIGHT HANDLED INCLUDING WEIGHT OF PACKING WILL BE TAKEN INTO ACCOUNT. GENERALLY WEIGHT INDICATED IN LR/RR/LWB WILL BE TAKEN FOR THIS PURPOSE. IN CASE WEIGHT INDICATED ON LWB IS 'FTL' OR 'FIXED', THE WEIGHT SHALL BE ASSESSED BY BHEL IN ACCORDANCE TO RELEVANT STANDARDS AND PAID ACCORDINGLY WHICH SHALL BE FINAL/BINDING ON CONTRACTOR.

11.4.2 VARIATION IN SITE WELD JOINT QUANTITIES

THE INDICATIVE QUANTITIES OF SITE WELD JOINTS ARE FURNISHED IN RELEVANT APPENDIX. HOWEVER, FOR ANY VARIATION IN THESE QUANTITIES, NO ADDITIONAL PAYMENT/ COMPENSATION IS ENVISAGED IN THIS CONTRACT.

11.5 RECIEPT OF MATERIAL TRANSPORTED BY RAIL

THE RATE SCHEDULE INVITED IN OFFER ARE FOR UNLOADING, STACKING VARIFICATION ETC OF MATERIALS RECEIVED TRANSPORTED BY ROAD, AS MOST OF THE MATERIALS ARE EXPECTED TO BE RECEIVED BY ROAD ON DOOR DELIVERY BASIS. HOWEVER, AT ANY STAGE, IN CASE RAILS RECEIVE SOME MATERIALS, ALL THE CONDITIONS SPECIFIED IN THESE SPECIFICATIONS SHALL BE APPLICABLE MUTATIS-MUTANDIS ON THE CONTRACTOR. THE WORK WILL INVOLVE RECIEPT, UNLOADING AT RAILWAY SIDING, VERIFICATION, TRANSPORTATION TO STORAGE YARD/ STORES/SITE, UNLOADING, VERIFICATION AND STAKING ETC. FOR PAYMENT IN RESPECT SUCH CONSIGNMENTS THE APPLICABLE RATE WILL BE 150% (1 ½ TIMES) OF ACCEPTED UNIT RATE APPLICABLE FOR HANDLING OF MATERIALS RECEIVED BY ROAD **(i.e. ITEM NO. A.1 OF RATE SCHEDULE).** NO OTHER PAYMENT IS ENVISAGED FOR SUCH RECEIPTS. THE TERMS OF PAYMENT DEFINED UNDER SECTION-12 SHALL ALSO BE APPLICABLE FOR RAIL RECEIPTS AS ABOVE.

11.6 INTREST BEARING ADVANCE

Interest bearing (rate of interest will be 1% per annum more than bank interest rate, 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).

11.7 DEFINITION OF WORK COMPLETION

THE CONTRACTOR'S SCOPE OF WORK UNDER THESE SPECIFICATIONS WILL BE DEEMED 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.

11.8 SPLITTING OF WORK

BHEL reserves the right to split up the work and award to more than one agency in case contractor fails to provide adequate resources, manpower etc. to achieve the desired progress of work

11.9 Liquidated damages (L D)

L D shall be applicable as per General Terms & Conditions (GCC) of contract.

SECTION-12

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 TREATED AS AMOUNT PAYABLE BUT NOT DUE AND SHALL BE ON ACCOUNT OF WORKMANSHIP GUARANTEE OF WORK EXECUTED. THE SAME IS TO BE RELEASED AFTER COMPLETION OF THE GUARANTEE PERIOD OF 12 MONTHS FROM THE DATE OF COMPLETION OF ENTIRE WORK AS CERTIFIED BY BHEL ENGINEER. HOWEVER THIS AMOUNT MAY BE RELEASED ON SUBMISSION OF BANK GUARANTEE OF EQUAL AMOUNT AND TENURE IN PRESCRIBED FORMAT AND THE BG SHALL BE KEPT VALID TILL COMPLETION OF SUCH GUARANTEE PERIOD AND AN ADDITIONAL SIX MONTHS CLAIM PERIOD.

12.0.4
THE PAYMENT FOR RUNNING BILLS WILL NORMALLY BE RELEASED WITHIN AROUND 30 DAYS OF SUBMISSION OF RUNNING BILL WITH MEASUREMNT 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.

12.3 Mode of payment and measurement of work completed shall be as per the provisions of clause No. 2.6 of G.C.C.

Material Handling Services:-

The contractor shall submit his bills duly furnishing the following information:

The Gross Weight as Per LWB/PWB.

PWB/LWB Number and Date

Vehicle Number and Number of Bundles/Boxes/Pieces/Crates In Each Vehicle.

Shortage/Damage Reports On BHEL's Standard Material Management Forms.

Rate/Per Tonne.

Amount Claimed.

Recovery Such As Hire Charges, If Any, Etc

DB No. / Date

Any Other Input/Details Required By BHEL.

12.4 Stage Break Up For Progressive Pro-Rata Payments:-

12.4.1 For receipt / unloading, verification and stacking etc:-

(Refer items under Sl. No. B-1 of Section-B of Rate Schedule of Part-II Price Bid)

a) 55% of rate shall be paid as soon as the materials are received and unloaded, as per RR/WB.

b) 40 % of the rate shall be paid as soon as the materials are duly verified and stacked as per packing slip/loading advice slip by repacking, stacking etc. wherever necessary. Payment will be released on submission of information as per materials management forms by the contractor immediately after verification of materials and certified by BHEL engineers. The requisite proforma would be supplied by site engineer. Normally, it is expected that the time lag between receipt of material and verification be kept at barest minimum possible, not exceeding 30 days in any case.

c) 5 % of the rate shall be paid on submission of shortage / damage report. Processing of case with under writer if any due to shortage/damage to material.

12.4.1.1 The payment for items under Sr. No. B-2, B-3, B-4, B-5 and B-6 of Section-B of Rate Schedule of Part-II Price Bid shall be made 95 % of actual quantity of work executed.

12.4.2 For Infrastructure and HTG sets with Associated -

Auxiliaries:-

(Refer item under Sl. No. A-1 of Section-A of Rate Schedule of Part-II Price Bid)

a) Development of Infrastructure: (5%)

i) 2% of contract value on completion of grading / leveling of land, roads, and fencing of stores and lighting of open yard of stores and office.

ii) 2% on construction of closed storage sheds and office shed.

iii) 1% on completion of construction power arrangement.

b) HTG sets with associated auxiliaries:-

i) **Embedded and Foundation Parts** :(**10 %**)

SLNo.	DESCRIPTION OF ACTIVITIES	PERCENTAGE
01	ERECTION OF DT KNEE LINER	2.50
02	WELDING OF DT KNEE LINER AND RELEASE FOR CONCRETING	2.50
03	ERECTION OF DT CONE AND WELDING	1.00
04	ASSEMBLY OF SPEED RING	1.00
05	ERECTION OF SPEED RING	0.50
06	ASSEMBLY, ERECTION & WELDING OF RUNNER CHAMBER	1.00
07	ASSEMBLY & ERECTION OF PIT LINER	1.00
08	UNDER WATER PAINTING	0.50
	TOTAL PERCENTAGE	**10 %**

ii) TURBINE (32%)

SLNo.	DESCRIPTION OF ACTIVITIES	PERCENTAGE
01	TURBINE GUIDE BEARING PAD SCRAPPING	0.50
02	OVER HAULING AND ASSEMBLY OF RUNNER	2.50
03	RUNNER SHAFT ASSEMBLY AND HYDRAULIC TESTING	1.50
04	TRIAL ASSEMBLY OF GUIDE APPARATUS	2.50
05	LOWERING OF RUNNER-SHAFT ASSY.	1.00
06	FINAL ASSY. OF GUIDE APPARATUS	2.00
07	OVERHAULING & TESTING OF GV SERVO MOTORS	0.50
08	ERECTION OF SERVO MOTORS	1.00
09	ERECTION OF OIL PRESSURE RECEIVER WITH MOUNTINGS	0.50
10	ERECTION OF OIL PRESSURE UNIT	0.50
11	ERECTION OF MECHANICAL CABINET	0.50
12	ERECTION OF GOVERNOR OIL PIPE LINES	2.00
13	ERECTION OF COMPRESSED AIR LINE	1.00
14	INSTALLATION OF TOP COVER PUMP AND	1.00

SLNo.	DESCRIPTION OF ACTIVITIES	PERCENTAGE
	PIPING	
15	COOLING WATER TO TURBINE	1.00
16	ASSY. OF GUIDE BEARING HOUSING AND SUMP	1.50
17	ASSY. OF TURBINE SEALING	2.00
18	FINAL ASSY OF GUIDE BEARING	1.50
19	ASSEMBLY OF OIL HEADER	2.00
20	ARRANGEMENT OF FEED BACK MECHANISM	1.00
21	ERECTION OF DT AND SPIRAL DRAIN VALVES	0.50
22	ERECTION OF AIR VALVES AND PIPING	0.50
23	MISC COMPLETION ITEMS	0.50
24	PLATFORM & RAILINGS IN TURBINE	1.00
25	INSTALLATION OF MONORAIL	0.50
26	INSTALLATION OF SHEAR PIN CONTACT AND CABLING ETC	0.50
27	INSTALLATION OF DISCHARGE MEASURING DEVICE	0.50
28	INSTALLATION OF METERING INSTRUMENTS AND PIPING	0.50
29	OIL FILLING IN OPU, PR. TESTING OF GOV. OIL PIPING	0.50
30	PAINTING	1.00
	TOTAL PERCENTAGE	**32%**

iii) GENERATOR (44 %)

SLNo.	DESCRIPTION OF ACTIVITIES	PERCENTAGE
1.	ERECTION OF STATOR & BOTTOM BRACKET SOLE PLATE	0.50
2.	ASSY. OF STATOR SEGMENTS	1.00
3.	ERECTION AND ALIGNMENT OF STATOR	0.50
4.	LAYING OF COILS/BARS	2.00
5.	MAKING OF STATOR COIL JOINTS / BRAZING	2.00
6.	TESTING OF BRASED JOINTS, CAPING, INSULATION & BUS BAR CONNECTIONS	1.50
7.	STATOR DRY OUT AND H.VE. TEST	1.00
8.	CLEANING, DEBURRING AND SEGREGATION OF RIM PUNCHING	2.00
9.	POSITIONING OF ROTOR SPIDER AND LEVELLING	0.50
10.	ROTOR RIM BUILDING AND FIRST STAGE PRESSING	0.50
11.	ROTOR RIM BUILDING SECOND STAGE	0.50
12.	FINAL PRESSING OF ROTOR RIM AND LOCKING OF FASTNERS	1.00
13.	MOUNTING OF POLES AND KEY DRIVING	2.00
14.	POLE TO POLE CONNECTION	1.00
15.	ROTOR DRY OUT AND H.V. TESTING	1.00
16.	INSTALLATION OF FAN SEGMENTS	1.00
17.	ASSEMBLY, ERECTION AND ALIGNMENT OF BOTTOM BRACKET	1.00
18.	OVERHAULING AND HYDRO TEST OF BRAKE JACKS	0.50

SLNo.	DESCRIPTION OF ACTIVITIES	PERCENTAGE
19.	ERECTION OF BRAKE JACK PANEL AND PIPING	0.50
20.	ASSEMBLY OF THRUST BEARING	0.50
21.	LOWERING OF GENERATOR SHAFT	0.50
22.	INSTALLATION OF H.P LUB SYSTEM AND PIPING	0.50
23.	LOWERING OF ROTOR INTO STATOR ASSEMBLY WITH SHAFT	0.50
24.	ASSEMBLY, ERECTION AND ALIGNMENT OF UPPER BKT	0.50
25.	COMPLETION OF COMBINED ALIGNMENT	2.00
26.	STATOR / ROTOR FORM CHECKING AND AIR GAP SETTING	0.50
27.	TESTING OF STATOR AIR COOLER AND MOUNTING	0.50
28.	TESTING OF THRUST AND GUIDE BEARING OIL COOLERS	0.50
29.	INSTALLATION OF COOLING WATER PIPES OF GENERATOR AIR AND OIL COOLERS	1.00
30.	INSTALLATION OF CO2 EQUIPMENT AND PIPING	1.00
31.	INSTALLATION OF OVER SPEED DEVICE AND BRUSH GEAR	0.50
32.	ASSEMBLY OF STATOR EXTERNAL TERMINALS	0.50
33.	INSTALLATION OF AIR GUIDE AND BAFFLE COVERS	0.50
34.	INSTALLATION OF ANTI-CONDENSATION HEATERS	0.50
35.	INSTLLATION OF BRUSH GEAR CASING AND FLOOR PLATES	1.00
36.	INSTALLATION OF GENERATOR BEARING OIL COOLER AND PIPING	0.50
37.	DOWELLING OF TOP BRACKET, BOTTOM BRACKET AND STATOR SOLE PLATE	0.50
38.	INSTALLATION OF COLLECTOR AND TOOTHED WHEEL	0.50
39.	BOXING OF BOTTOM GUIDE BEARING	0.50
40.	BOXING OF THRUST BEARING	0.50
41.	ERECTION OF BRAKE DUST COLLECTION EQUIPMENT, PIPING ETC.	0.50
42.	ERECTION OF BUS-DUCT AND HV TEST	8.00
43.	INSTALLATION OF NG/LAVT CUBICLE	0.50
44.	ASSEMBLY OF CURRENT CARRYING LEADS AND SLIPRING	0.50
45.	INSTALLATION OF PIT AIR SEAL	0.50
46.	OIL FILLING IN BEARINGS AND CENTRIFUGING	0.50
	TOTAL PERCENTAGE	**44%**

iv) Common System for All Units (3 %)

SLNo.	DESCRIPTION OF ACTIVITIES	PERCENTAGE
01	ERECTION OF DRAINAGE AND DEWATERING SYSTEM	1.25

02	ERECTION OF HP/LP AIR COMPRESSORS, RECEIVER & COMMON PIPING	0.50
03	ERECTION OF COOLING WATER PUMPS AND SYSTEM	0.50
04	GROUND EARTHING MATS LAYING AND WELDING, UP TO RISER	0.25
05	FINAL PAINTING	0.50
	TOTAL PERCENTAGE	**3 %**

v) Pre-Commissioning & Testing (6 %)

SLNo.	DESCRIPTION OF ACTIVITIES	PERCENTAGE
01	PRE-COMMISSIONING CHECKS/TESTS OF GOVERNING SYSTEM	1.00
02	TRIAL RUN OF ALL AUXILIARIES	1.00
03	SPINNING AND BEARING RUN	2.00
04	SYNCHRONISATION	1.00
05	CONDUCTING RELIABILITY TEST AND UNIT H / O TO SMHPCL	1.00
	TOTAL PERCENTAGE	**6%**

12.4.4 Payment for Material Management Services:-

(Refer item under Sl. No. C-1, C-2, C-3 and C-4 of Section-C of Rate Schedule of Part-II Price Bid)

100% PAYMENT WILL BE MADE FOR EACH MONTH AS CERTIFIED BY BHEL ENGINEER INCLUSIVE OF SUNDAYS AND HOLIDAYS AS DECLARED BY BHEL FOR A PARTICULAR MONTH.

SECTION-13
SPECIAL CONDITIONS OF CONTRACT

13.0 EXTRA CHARGES FOR RECTIFICATION AND MODIFICATION

13.1
IF EXTRA WORKS (REQUIRING LESS THAN **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, ARE NEEDED DUE TO ANY CHANGE IN OR DEVIATION FROM THE DRAWINGS AND DESIGN OF EQUIPMENT, OPERATION/ MAINTENANCE REQUIREMENTS, MISMATCHING, TRANSIT DAMAGES AND OTHER ALLIED WORKS WHICH ARE NOT VERY SPECIFICALLY INDICATED IN THE DRAWINGS, BUT ARE FOUND ESSENTIAL FOR SATISFACTORY COMPLETION OF THE WORK, ARE DONE, NO EXTRA CHARGES WILL BE PAID. THE TENDERERS ARE REQUESTED TO TAKE THIS ASPECT INTO ACCOUNT AND THE QUOTED RATE SHOULD INCLUDE ALL SUCH CONTINGENCIES.

13.2
IT MAY ALSO BE NOTED THAT IF ANY SUCH SAID EXTRA WORKS ARISE ON ACCOUNT OF THE CONTRACTOR'S FAULT, IRRESPECTIVE OF TIME CONSUMED IN RECTIFICATION OF THE DAMAGE/LOSS, IT WILL HAVE TO BE CARRIED OUT BY THE CONTRACTOR FREE OF COST. UNDER SUCH CIRCUMSTANCES, ANY MATERIAL AND CONSUMABLE REQUIRED FOR THIS PURPOSE WILL ALSO HAVE TO BE ARRANGED BY THE CONTRACTOR AT HIS COST.

13.3
HOWEVER, BHEL MAY CONSIDER FOR PAYMENT AS EXTRA, FOR SUCH OF THOSE WORKS DETAILED IN CLAUSE 13.1 WHICH REQUIRE MORE THAN **100 MAN-HOURS** AND SUCH PAYMENT WILL BE REGULATED BY THE TERMS, CONDITIONS AND STIPULATIONS CONTAINED IN THE CLAUSES 13.4 TO13.8 AND/OR 14.2.1 TO 14.2.10 AS THE CASE MAY BE. IT MAY BE SPECIFICALLY NOTED THAT THE DECISION OF BHEL AS TO WHETHER SUCH PAYMENT IS DUE SHALL BE FINAL AND BINDING ON THE CONTRACTOR. IT MAY ALSO BE NOTED THAT ONLY THOSE WORKS THAT ARE IDENTIFIED AS MAJOR AND WARRANT EXTRA PAYMENT AND CERTIFIED AS SUCH BY THE SITE ENGINEER AND ACCEPTED BY THE DESIGNERS AND/OR COMPETENT AUTHORITY OF BHEL, WILL BE CONSIDERED FOR EXTRA PAYMENT.

13.4
FOR EXTRA WORKS ARISING OUT OF TRANSIT, STORAGE AND ERECTION DAMAGES, PAYMENT, IF FOUND DUE, WILL BE REGULATED BY CLAUSES 14.2.1 TO 14.2.10.

13.5
ALL THE EXTRA WORK SHOULD BE CARRIED OUT BY A SEPARATELY IDENTIFIABLE GANG, WITHOUT AFFECTING ROUTINE ACTIVITIES. DAILY LOG SHEETS IN THE PRO-FORMA PRESCRIBED BY BHEL SHOULD BE MAINTAINED AND SHALL BE SIGNED BY THE CONTRACTOR'S REPRESENTATIVE AND BHEL ENGINEER. NO CLAIM FOR EXTRA WORK WILL BE CONSIDERED/ENTERTAINED IN THE ABSENCE OF THE SAID SUPPORTING DOCUMENTS I.E. DAILY LOG SHEETS. IT MAY, HOWEVER BE NOTED THAT SIGNING OF LOG SHEETS BY BHEL ENGINEER DOES NOT MEAN THE ACCEPTANCE OF SUCH WORKS AS EXTRA WORKS. ALL ADMISSIBLE CLAIMS SHALL BE SUBMITTED TO BHEL

13.6
BHEL RETAINS THE RIGHT TO AWARD OR NOT TO AWARD ANY OF THE MAJOR REPAIR/ REWORK/MODIFICATION/RECTIFICATION/FABRICATION WORKS UNDER CLAUSES 13.1 TO 13.6 TO THE CONTRACTOR, AT THEIR DISCRETION WITHOUT ASSIGNING ANY REASON FOR THE SAME.

13.7

EXTRA WORKS THAT ARISE ON ACCOUNT OF CONTRACTOR'S FAULT WILL HAVE TO BE CARRIED OUT BY THE CONTRACTOR FREE OF COST INCLUDING THE SUPPLY OF MATERIAL AND CONSUMABLES

13.8
AFTER ELIGIBILITY OF EXTRA WORKS IS ESTABLISHED AND FINALLY ACCEPTED BY BHEL ENGINEER/DESIGNER, PAYMENT WILL BE RELEASED ON COMPETENT AUTHORITY'S APPROVAL AT THE FOLLOWING RATE.

MAN-DAY RATE FOR ELIGIBLE EXTRA WORKS :

SINGLE AVERAGE MAN-DAY RATE, INCLUDING OVERTIME IF ANY, AND OTHER SITE EXPENSES AND INCIDENTALS, INCLUDING CONSUMABLES, TOOLS AND TACKLES, FOR CARRYING OUT ANY MAJOR REWORK/ REPAIRS/ RECTIFICATION/ MODIFICATION/ FABRICATION OF 8 HOURS AS MAY ARISE DURING THE COURSE OF ERECTION. (REFER CLAUSES 13.1 TO 13.8 AND 14.2.1 TO 14.2.10) UNDER BOILER & AUX. ERECTION & COMMISSIONING WORKS WILL BE **RS. 320/- (RUPEES THREE HUNDRED AND TWENTY ONLY). HOWEVER ABOVE EXTRA WORK MAN DAY RATE SHALL NOT BE APPLICABLE FOR MATERIAL HANDLING AND MATERIAL MANAGEMENT SERVICES.**

NO PAYMENT WILL BE MADE IF AN ITEM OF WORK LASTS LESS THAN 100 MANHOURS.

SECTION-14
SPECIAL CONDITIONS OF CONTRACT

INSURANCE

14.1
BHEL HAS ARRANGED A COMPREHENSIVE MARINE, STORAGE CUM ERECTION INSURANCE COVER ALL RISKS INCLUDING DAMAGES/LOSS OCCURRING DURING INLAND TRANSPORT. BUT SUCH COVER IS LIMITED TO ONLY THE MATERIALS TRANSPORTED.

14.2
THE CONTRACTOR HAS TO ARRANGE ON HIS OWN, INSURANCE COVER FOR ALL THE T&P AND OTHER CONSTRUCTION EQUIPMENTS DEPLOYED AT SITE. SUCH ASSETS ARE NOT COVERED IN INSURANCE POLICY TAKEN BY BHEL.

14.3
IT SHALL ALSO BE THE RESPONSIBILITY OF THE CONTRACTOR TO ARRANGE FOR ACCIDENT RISK POLICY/WORKMEN COMPENSATION POLICY FOR THE STAFF AND WORKMEN.

14.4
THE CONTRACTOR HAS TO PROVIDE ASSISTANCE IN LODGING AND REALIZING THE INSURANCE CLAIMS COVERED BY THE MCE INSURANCE POLICY THAT IS TAKEN BY BHEL. SCOPE SHALL INCLUDE RECEIPT INSPECTION (SHORTAGE/DAMAGE/LOSS REPORTING) IMMEDIATELY ON ARRIVAL OF CONSIGNMENT, RECORDING SUCH DAMAGE/LOSS/SHORTAGE INTIMATION ON THE LR/RR/LWB DULY COUNTERSIGNED BY THE DRIVER/TRANSPORTER'S REPRESENTATIVE WHILE ACKNOWLEDGING RECEIPT OF CONSIGNMENT TO THE CONCERNED TRANSPORTER, INTIMATING THE LOSS/DAMAGE/SHORTAGE TO BHEL, PROVIDING ASSISTANCE FOR INSPECTION OF THE REPORTED CONSIGNMENT AT THE TIME OF INSURANCE SURVEY, LIASIONING WITH THE TRANSPORTER AND INSURANCE COMPANY ETC.

14.5
IN CASE OF THEFT / DAMAGE / LOSS OF MATERIALS DUE TO NEGLIGENCE OR 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 SHALL BE RECOVERED FROM THE CONTRACTOR. RECOVERY WILL BE LIMITED TO NORMAL DEDUCTIBLE FRANCHISE (DF) / EXCESS AS PER APPLICABLE INSURANCE TARIFF (TAC) GUIDELINES. HOWEVER, IN CASE SUCH INSURANCE CLAIM IS SUMMARILY REJECTED BY THE UNDERWRITERS DUE TO **WILFUL** DAMAGE/LOSS ON THE PART OF THE CONTRACTOR, THE TOTAL COST OF REPAIR/ REPLACEMENT SHALL BE RECOVERED FROM THE CONTRACTOR.

14.6 INSURANCE BY THE CONTRACTOR AND INDEMNIFICATION OF BHEL

BHEL HAVE TAKEN A 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. HOWEVER, THE TENDERER 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 TENDERER'S SPECIFIC ATTENTION IS ALSO INVITED TO CLAUSE 2.10 OF GENERAL CONDITIONS OF CONTRACT.

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 REMITTENCE SHALL BE ACCEPTABLE TO BHEL.**

15.1.1 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.

15.1.2 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 COLLECTED FROM 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.

15.2.2 SECURITY DEPOSIT MAY BE FURNISHED IN ANY ONE OF THE FOLLOWING FORMS

I) CASH (AS PERMISSIBLE UNDER THE INCOME TAX ACT)

II) PAY ORDER, DEMAND DRAFT IN FAVOUR OF BHEL.

III) LOCAL CHEQUES OF SCHEDULED BANKS, SUBJECT TO REALIZATION.

IV) SECURITIES AVAILABLE FROM POST OFFICES SUCH AS NATIONAL SAVINGS CERTIFICATES, KISAN VIKAS PATRAS ETC.

(CERTIFICATES SHOULD BE HELD IN THE NAME OF CONTRACTOR FURNISHING THE SECURITY AND DULY PLEDGED IN FAVOUR OF BHEL AND DISCHARGED ON THE BACK).

V) BANK GUARANTEE FROM SCHEDULED BANKS / PUBLIC FINANCIAL INSTITUTIONS AS DEFINED IN THE COMPANIES ACT SUBJECT TO A MAXIMUM OF 50% OF THE TOTAL SECURITY DEPOSIT VALUE. THE BALANCE 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 (BY BANK GUARANTEE OR DEMAND DRAFT) BEFORE START OF THE WORK AND THE BALANCE 50% MAY BE RECOVERED FROM THE RUNNING BILLS.

VIII) EMD OF THE SUCCESSFUL TENDERER, EXCEPTING THOSE WHO HAVE REMITTED 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.

15.2.3 SECURITY DEPOSIT SHALL NOT BE REFUNDED TO THE CONTRACTOR EXCEPT IN ACCORDANCE WITH THE TERMS OF THE CONTRACT.

APPENDIX – I

Heaviest and Largest Consignments for Transportation and Site Handling
(App. Weight and dimension)

A) Heaviest package to be handled during material handling at store/store yard, transportation to site per unit:-

Cl. No.	PARTICULARS	ITEM
1	**Heaviest package of generator for transport** A) Name B) Weight C) Dimension(LXBXH) in mm.	 Generator shaft 40000 Kg. 7400X2400X2400
2	**Largest Package of generator for Transport** A) Name B) weight C) Dimension(LXBXH) in mm	 1/3 Wound Stator Sector 34000 kg 8800X2500X3000
3	**Largest Package of turbine for transport** A) Name B) Weight C) Dimension (LXWXH) in Meter	 Stay ring 35000 Kg 9.4 X 4.7 X 3.8 M
4	**Heaviest Package of turbine for transport** A) Name B) Weight C) Dimension in Meter	 Runner 54000 Kg 5.6 Dia. X 2.5 M
5	**Heaviest Package of Transformer** **A) Name** **B) Weight** **C) Dimension in mm**	 Generator Transformer 98000Kg. 5600x2800x4000

B) Heaviest assemblies to be handled at site during erection:-

1	**Heaviest assembly of generator be lifted by power house crane** A) Name B) weight	 Rotor 133500 Kg
2	**Largest assembly of generator to be lifted by Power house crane** A) Name B) weight C) Dimension (LXBXH) in mm	 Wound stator 90500 Kg 9350X9350X3000
3	**Heaviest assembly of turbine to be lifted by Power house crane** A) Name B) Weight C) Dimension in mm	 Inner top cover +Shaft + Runner assembly 105000 Kg 6100 mm Dia. X 10500

Appendix-II

List of T&P to Be Provided By BHEL Free Of Hire Charges

Note:-

01. Special tools and plants, which are supplied as part of equipment for erection use, shall be issued to contractor on free of hire charge. However; contractor shall return the same to BHEL store in good & working condition.

02. BHEL will make available the oil centrifuge M/C for purifying and filling of lube oil in to the permanent plant and systems.

Appendix-III

Major Tools and Plants and MMD's to Be Deployed by the Contractor

A)

Sl.No.	Description Of Equipments	Capacity	Min. Qty/ Remarks
01	TIG Welding Torch Air/Water Cooled	-	4 sets/As per site requirement
02	Welding generators	450/600 Amp	10 Nos.
03	3 ph distribution board with complete set up for drawl of construction power	600 Amp	As Per Site requirement.
04	Cables For Drawl & Distribution Of Construction Power	-	As Per Site requirement
05	Hydraulic Pipe Bending Machine	Up To 4" Dia	2 Nos.
06	Ultrasonic test Arrangement Including Source		1 Set
07	Tap and Die sets metric & BSP	Up to 42 mm	As Per Site requirement
08	Taper and parallel reamers, Rotary cutting machines, grinders, Spray painting M/c	-	As Per Site requirement
9	Drill machines with magnetic stand	Up to 32 mm	4 Nos.
10	Air compressor	10 Kg/cm2	Along with 1.5 m3 receiver
11	Rectiformer of suitable rating for heating of generator stator and rotor windings	2500Amp/90 V	1 No.
12	H.V. testing Kit of suitable rating for high voltage testing of generator stators and rotor	30 KV/250KVA	1 No.
13	Precision Master block level and water level micrometer for leveling of assemblies.	0.02 mm /M	1 No.
14	Stick Micrometer	5 Meter length	1 No.
15	Gas cutting and heating torch sets	Suitable for site use	As per site requirement
16	Brazing torches	Suitable for site use	As per requirement
17	Truck / trailer	Suitable for site requirement.	1 No. each.
18	Mobile cranes	20 T & 10 T	1 No. each

NOTE:

1) **In addition to above Contractor shall arrange suitable heavy duty crane/Suitable arrangement like jack and sleeper, slings etc for unloading/handling for heavy items as per site requirement.**

2) The above T & P is just to name a few, contractor shall asses the requirement, plan and provides all necessary T & P/ test equipments etc keeping in view the requirement to meet the schedule for the satisfactory execution of the contract in a complete manner.

B) **MMDs:**

As are required to execute said work.

- Contractor shall kept all T&P, MMD's, test equipments, instruments etc. brought for execution of the work at site till completion of the work of last unit .

Appendix IV

List of Drawings

DESCRIPTION	DRG. NO.
* Station Layout (BHEL) Maheshwar HEP	
*a) Elevation	02000013751
* Section through Turbine	221009
* Section through Generator	-
Plan for closed sheds for store.	1 sheet
Foundation Details for closed sheds.	1 sheet

* These drawings are for showing general arrangement only.

Appendix-V

The following consumables shall be provided by BHEL free of charge:-

1) Consumables like insulating materials for assembly of stator/rotor etc, supplied by BHEL manufacturing unit shall be made available to the contractor free of charge.

2) For permanent plant use oil / lubricants / grease for the initial and subsequent filling shall be provided free of charge limited to supply by Bhopal.

3) Welding electrodes for DT liner, DT cone, Runner envelope, stay ring and pit liner welding limited to supply by Bhopal.

4) Finish paint for water path.

APPENDIX-V

ANALYSIS OF UNIT TOTAL 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		

SIGNATURE OF THE TENDERER

DATE:

APPENDIX-VI

FORMAT FOR MONTH-WISE MANPOWER DEPLOYMENT PLAN

(CATEGORY-WISE NUMBERS TO BE INDICATED FOR EACH MONTH)

SL. NO.	**1.1.1.1 CATEGORY**	**1.1.1.2 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											
SO ON												
	MONTH WISE TOTAL											

SIGNATURE OF TENDERER

DATE:

THIS DEPLOYMENT PLANT SHOULD BE MADE FOR TOTAL CONTACT PERIOD.

APPENDIX–VII

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												
SO ON												

SIGNATURE OF THE TENDERER

DATE:

BIDDER MUST INCLUDE ALL THE T & Ps AS MENTIONED IN APPENDIX-III along with other necessary T&PS WHILE SUBMITTING THIS T & P DEPLOYMENT PLANT FOR A TOTAL CONTRACT PERIOD.

APPENDIX-VIII

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

DATE

SIGNATURE OF THE TENDERER

APPENDIX–IX

DETAILS OF SIMILAR WORK DONE DURING THE LAST SEVEN YEARS

SL. NO.	FULL POSTAL ADDRESS OF CLIENT & NAME OF OFFICER IN CHARGE	DESCRIP-TION OF WORK	VALUE OF CONTRACT	DATE OF AWARD OF WORK	DATE OF COMMENCE MENT 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