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

NO: BHE/PW/PUR/GNR-RM-STG/547

FOR

COLLECTION OF MATERIALS FROM STORES/STORAGE YARD, TRANSPORTATION TO SITE OF WORK, RENOVATION AND MODERNIZATION, TESTING, COMMISSIONING, HANDING OVER OF THE UNIT TO CUSTOMER, RETURNING OF DISMANTLED / SURPLUS MATERIALS TO BHEL/CLIENT'S YARD, AND HANDING OVER OF 2X120 MW UNIT#1&2 TG SET AND ITS AUXILIARIES AND TG PIPING .

AT

GSECL, GANDHINAGAR TPS UNIT-1&2 (120 MW)

DISTT. GANDHINAGAR, GUJARAT

Part- I -- TECHNICAL BID

(Volume-I)

SPECIAL & GENERAL CONDITIONS OF CONTRACT

Book No.

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

C O N T E N T S

LEGEND:

$: Attached at the end of hard copy of Tender Specifications Part-I. Hosted in BHEL web page (www.bhel.com) as file titled **"NIT+GCC-547".**

@: Issued as separate hard copy booklet 'Tender Specifications Part-II (Price Bid)'. Hosted in BHEL web page (www.bhel.com) as file titled **"PRICE BID-547"**

Note:

Rest of the tender documents are included in Tender Specifications Part-I. Hosted in BHEL web page (www.bhel.com) as file titled "**TECH BID-547"**

BHARAT HEAVY ELECTRICALS LIMITED

(A GOVERNMENT OF INDIA UNDERTAKING)
POWER SECTOR - WESTERN REGION-SAS
SHREEMOHINI COMPLEX
345, KINGS WAY - NAGPUR 440 001

TENDER SPECIFICATION NO. NO: BHE/PW/PUR/GNR-RM-STG/547

FOR

COLLECTION OF MATERIALS FROM STORES/STORAGE YARD, TRANSPORTATION TO SITE OF WORK, RENOVATION AND MODERNIZATION, TESTING, COMMISSIONING, HANDING OVER OF THE UNIT TO CUSTOMER, RETURNING OF DISMANTLED / SURPLUS MATERIALS TO BHEL/CLIENT'S YARD, AND HANDING OVER OF 2X120 MW UNIT#1&2 TG SET AND ITS AUXILIARIES AND TG PIPING .

AT

GSECL, GANDHINAGAR TPS TG-1& 2 (120 MW),
DISTT. GANDHINAGAR, GUJARAT

EARNEST MONEY DEPOSIT: Please see Section-15 of Special Conditions of Contract.

LAST DATE AND TIME FOR RECEIPT OF OFFERS: Please visit web page www.bhel.com -> **"Tender Notification"** and **"View Corrigendum"**

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

M/s. ……

…….

PLEASE NOTE:

1) **THESE TENDER DOCUMENTS ARE NOT TRANSFERABLE.**
2) **TENDERER SHALL NOTE THAT THEIR OFFER WILL BE CONSIDERED SUBJECT TO THE APPROVAL OF BHEL'S CUSTOMER M/s GESCL.**

For Bharat Heavy Electricals Limited

SR MANAGER (PURCHASE)
PLACE: NAGPUR
DATE:

BHARAT HEAVY ELECTRICALS LIMITED
(A Government of India Undertaking)
POWER SECTOR - WESTERN REGION-SAS
345, KINGS WAY - NAGPUR 440 001

PROCEDURE FOR SUBMISSION OF SEALED TENDERS

THE TENDERER MUST SUBMIT THEIR TENDERS AS REQUIRED IN TWO PARTS IN SEPARATE SEALED COVERS PROMINENTLY SUPERSCRIBED AS PART-I TECHNICAL BID AND PART-II PRICE BID AND ALSO INDICATING ON EACH OF THE COVERS THE TENDER SPECIFICATION NUMBER AND DUE DATE AND TIME AS MENTIONED IN THE TENDER NOTICE.

PART-I (TECHNICAL BID) COVER-I

EXCEPTING RATE SCHEDULE, ALL OTHER SCHEDULES, DATA SHEETS AND DETAILS CALLED FOR IN THE SPECIFICATION SHALL BE ENCLOSED IN PART-I "TECHNICAL BID" ONLY.

PART-II (PRICE BID) COVER-II

ALL INDICATIONS OF PRICE SHALL BE GIVEN IN THIS PART-II "PRICE BID". **EMD SHALL NOT BE INCLUDED IN THIS COVER.**

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

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

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

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

2. CONTRACTOR SHOULD HAVE SOUND FINANCIAL STABILITY.

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

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

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

6. OFFERS MUST BE SUBMITTED WITHOUT ANY DEVIATION.

7. OFFERS RECEIVED WITH ANY DEVIATION OR WITHOUT RELEVANT INFORMATION AS DESCRIBED ABOVE ARE LIABLE TO BE REJECTED. PRICE BIDS RECEIVED IN THE FORM OTHER THAN SPECIFIED IN PART-II (PRICE BID) ARE LIABLE TO BE REJECTED.

PROJECT INFORMATION

1.0 INTRODUCTION

The Gandhinagar TPS is about 35Km from Ahemdabad.The site is approachable by road . The nearest railway station is Gandhinagar.

LOCATION & APPROACH

1) Project: Thermal Power Station Unit # 1 &2 (120MW), Gandhinagar

2) Project location: GANDHINAGAR, DIST: GHANDHINAGAR & CAPITAL OF, GUJARAT STATE.

3) Transport facilities:

A) Nearest railway: GANDHINAGAR on the broad gauge, connected from AHEMDABAD junction

B) Name of railway:

a) Power Station is having broad gauge private railway siding served through Rly. Station at distance of about 10kms.

b) The site is also connected by all weather road from AHEMDABAD through State Highway at a distance of 35 kms from the power station.

4) Climate condition:

Maximum temp:	45 Deg.C
Minimum temp:	5 Deg C
Max daily average Temp	35 Deg C
Max yearly average Temp	30 Deg C
Max Humidity :	85%
Minimum humidity	15%
Annual average rain fall	1500 mm (During June –Sep)

Checklist (Vide Para 1.3 of section-I of General Conditions of Contract)				
1	Name of the bidder with address			
2	Phone No. Fax No., E-mail address			
3	Name of the Contact Person			
4	Nature of the firm	Proprietary/Partnership/Limited Company		
5	EMD details (See Section-15 of Tender Specs for details)			
6	Validity of offer (required 6 months from Last Date for offer Submission)			
7	Mobilization time (not exceeding 07 days from fax L.O.I.)			
8	Whether Certificate of no Deviation is furnished		Yes	No
9	Tenderer has visited the project site and acquainted with the site conditions		Yes	No
10	Details of concurrent jobs are furnished (as per Appendix- IX)		Yes	No
11	Headquarters' organisation chart is furnished		Yes	No
12	Proposed site organisation chart is furnished		Yes	No
13	Names and particulars of Directors /Partners are furnished		Yes	No
14	Financial status of the company (Annexure 'A' of GCC) is furnished		Yes	No
15	Profit & Loss account for preceding three financial years is furnished		Yes	No
16	Latest certificate from bidder's banker is furnished confirming Bank Guarantee/OD/Other Financial Limits enjoyed by the firm (Issued by Scheduled Bank excepting co-operative bank, Issue date not earlier than 6 months from Last Date of offer submission)		Yes	No

Checklist (Vide Para 1.3 of section-I of General Conditions of Contract)			
17	Latest Income Tax Clearance Certificate or Copy of PAN Card accompanied by 'IT Return' copy is furnished	Yes	No
18	Month-wise Manpower deployment plan (appendix–VI is furnished	Yes	No
19	Month-wise deployment plan for major T&P (appendix-III) is furnished	Yes	No
20	Whether all the pages of the Tender Specification documents are read, understood and signed as a token of acceptance.	Yes	No
21	Copy of Power of Attorney enclosed in favour of person making offer.	Yes	No
22	Bidder has familiarized himself with all Relevant local laws & Conditions.	Yes	No
23	Safety Requirement of this work in a Running plant premises has been understood.	Yes	No
24	Erection and Commissioning Program (Bar Chart) furnished	Yes	No

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

Date: Signature of Bidder

DECLARATION BY BIDDER'S AUTHORIZED REPRESENTATIVE

I, HEREBY CERTIFY THAT ALL THE INFORMATION AND DATA FURNISHED BY ME WITH REGARD TO THE TENDER SPECIFICATION NO. **BHE/PW/PUR/GNR-RM-STG/547** 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/GNR-RM-STG/547

I/WE, M/s .....

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

SIGNATURE OF BIDDER

DATE:

SECTION-3
OFFER OF THE BIDDER

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

DEAR SIR,

I/WE HEREBY OFFER TO CARRY OUT THE WORK DETAILED IN TENDER SPECIFICATION NO. **BHE/PW/PUR/GNR-RM-STG/547** FOR 120 MW, UNIT # 1&2 **GESCL , GANDHINAGAR THERMAL POWER PLANT** , GANDHINAGAR ISSUED BY BHARAT HEAVY ELECTRICALS LIMITED, POWER SECTOR-WESTERN REGION, NAGPUR, IN ACCORDANCE WITH THE TERMS AND CONDITIONS THEREOF.

I/WE HAVE CAREFULLY PERUSED THE FOLLOWING DOCUMENTS CONNECTED WITH THE ABOVE WORK AND AGREE TO ABIDE BY THE SAME.

1. INSTRUCTIONS TO TENDERERS
2. GENERAL CONDITIONS OF CONTRACT
3. SPECIAL CONDITIONS OF CONTRACT
4. OTHER SECTIONS, APPENDICES, SCHEDULES AND DRAWINGS.

I/WE HAVE DEPOSITED / FORWARDED HEREWITH THE EARNEST MONEY DEPOSIT AS SPECIFIED IN THE TENDER SPECIFICATION. DETAILS OF EMD PAYMENT ARE FURNISHED IN THE CHECK LIST.

EMD SHALL BE REFUNDED SHOULD OUR OFFER NOT BE ACCEPTED / EMD **NEED NOT BE REFUNDED AND THE AMOUNT MAY BE TREATED AS "ONE TIME EMD" FOR ERECTION AND COMMISSIONING TENDERS OF BHEL-PSWR, NAGPUR**. SHOULD OUR OFFER BE ACCEPTED, I/WE FURTHER AGREE TO DEPOSIT SECURITY DEPOSIT FOR THE WORK AS PROVIDED FOR IN THE TENDER SPECIFICATION WITHIN THE STIPULATED TIME AS MAY SBE INDICATED BY BHEL, POWER SECTOR-WESTERN REGION, NAGPUR.
OR,
WE HAVE ALREADY DEPOSITED ONE TIME EMD OF Rs. 2,00,000/- (RUPEES TWO LACS ONLY), DETAILS OF WHICH ARE FURNISHED IN THE CHECK LIST.

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

PLACE: SIGNATURE OF TENDERER:
DATE: ADDRESS:

WITNESSES WITH THEIR ADDRESS

SIGNATURE	NAME	ADDRESS
1.		
2.		

SECTION-4

SPECIAL CONDITIONS OF CONTRACT

4.0 OBJECTIVE OF R & M WORK

THE REFURBISHMENT OF TURBINE, GENERATOR, & ITS AUXILIARIES ARE TO BE CARRIED OUT WITH THE AIM OF OPERATING THE UNIT ON FULL LOAD OF 120 MW WITH FOLLOWING OPERATING CONDITIONS, HOWEVER THE CONTRACTOR RESPONSIBLY IN THIS REGARD SHALL BE LIMITED TO HIS WORKMANSHIP AT SITE.

A) LIFE EXTENSION OF MACHINE BY ANOTHER 15 - 20 YEARS.

B) OPERATING AVAILABILITY FOR FIRST YEAR - 85%

C) HEAT RATE OF TURBINE - 2120 KCAL/KWH.

4.0.1 DETAILED CONTRACTORS SCOPE

THE WORK TO BE CARRIED OUT UNDER THE SCOPE OF THESE SPECIFICATIONS IN UNIT NO.1 &2 TG SET AND ITS AUXILIARIES INCLUDING TG PIPING ETC. AT GSECL, GANDHINAGAR.

1. PROVIDING ALL SERVICES INCLUDING LABOUR, TOOLS AND PLANTS, CONSUMABLES ETC; FOR OPENING/ DISMANTLING AND CLEANING OF COMPONENTS OF TG SET AND AUXILIARIES, HANDLING OF VARIOUS EQUIPMENTS/COMPONENTS, PROVIDING SCAFFOLDINGS AND ACCESS TO EQUIPMENTS/COMPONENTS/ FOUNDATION ETC.

2. DISMANTLING OF CLADDING, REMOVAL OF INSULATION, RETAINERS ETC FROM FOLLOWING

   A) INSULATION OF TURBINE CASINGS, PIPELINES AND VARIOUS OTHER COMPONENTS IN TG HALL.

   B) REPAIR / REPLACEMENT OF DAMAGED INSULATION AND ITS SHEEATHING AS REQUIRED AT SITE FOR TURBINE CASING, PIPELINES AND VARIOUS OTHER COMPONENTS IN TG HALL.

3. AFTER DISMANTLING, VARIOUS COMPONENTS WILL BE OFFERED TO BHEL FOR INSPECTION. DETAILED INSPECTION AND CONDITION ASSESSMENT WILL BE DONE UNDER THE ADVISE OF BHEL. MANPOWER, TESTING EQUIPMENTS, T&P AND CONSUMABLES REQUIRED FOR DPT, MPI, UT ETC SHALL BE SUB CONTRACTORS SCOPE. SUBSEQUENT RECTIFICATION/REPLACEMENT OF COMPONENTS FOR TURBINE, GENERATOR, AUXILIARIES AND VALVES ETC. IS COVERED IN THE SCOPE OF WORK.

4. CLEANING, SHOT/SAND BLASTING OF VARIOUS COMPONENTS OF TURBINE, PIPE LINE, AUXILIARIES ETC.

5. **DISMANTLING, REPLACEMENT/RECTIFICATION/ OVERHAULING/ SERVICING OF VARIOUS EQUIPMENTS/ COMPONENTS ALREADY IDENTIFIED AND INDICATED VIDE APPENDIX-I.**

6. CERTAIN EQUIPMENTS/COMPONENTS INCLUDING LP ROTOR, IP CASING, TURBINE PEDESTAL, GENERATOR ROTORS HAVE TO BE SENT TO BHEL MANUFACTURING UNITS/ OTHER LOCATIONS FOR FURTHER ACTIVITIES. CONTRACTOR SHALL BE RESPONSIBLE FOR FABRICATION OF PACKING BOX & PACKING. STEEL SECTIONS AND PLATES FOR FABRICATION OF CRATE WILL BE PROVIDED BY BHEL FREE OF CHARGE. CONTRACTOR SHALL ARRANGE ALL OTHER MATERIALS FOR PACKING INCLUDING WOODEN SLEEPPERS

OF SUCH EQUIPMENTS/ COMPONENTS. LOADING AND SECURING ON THE TRAILER/TRUCK (ARRANGED BY BHEL FROM EXTERNAL SOURCE) FOR ONWARD TRANSPORT TO BHEL UNIT SHALL BE PART OF WORK. ON RETURN OF THESE EQUIPMENTS/COMPONENTS FROM MANUFACTURING UNITS OF BHEL, UNLOADING AT APPROPRIATE/ INDICATED LOCATION, UNPACKING ETC IS IN THE CONTRACTOR'S SCOPE. AN ESCORT FOR TRAILOR/TRUCK DURING ONWARD/ RETURN JOURNEY FOR MAJOR COMPONENTS LIKE ROTOR ETC. ARE TO BE ARRANGED BY THE CONTRACTOR.

8. COLLECTION OF MATERIAL FROM BHEL'S STORES / STORAGE YARD TRANSPORTATION TO SITE OF WORK AND RETURNING OF MATERIAL AS AND WHEN REQUIRED. **THE CRANE, TRAILOR AND TRUCK REQUIRED FOR TRANSPORTATION OF MATERIAL IS IN THE SCOPE OF THIS CONTRACT AND CONTRACTOR HAS TO MAKE NECESSARY ARRANGEMENT.**

9. RETURNING OF UN-REUSABLE ITEMS/ COMPONENTS TO AREA EARMARKED IN BHEL/ CUSTOMER STORES/ STORAGE YARD. ALL DISMANTLED/SURPLUS MATERIAL ARE TO BE TRANSPORTED AND RETURNED BACK TO CUSTOMER AS PER BHEL / CUSTOMER REQUIREMENT.

10. ERECTION, ALIGNMENT AND WELDING/BOLTING/FASTENING.

11. SUPPLY AND APPLICATION OF SPRAY AND WOOL MATTRESS INSULATION, & REPLACEMENT OF CLADDING SHEETS WHEREVER REQUIRED.

12. NON-DESTRUCTIVE EXAMINATION & POST WELD HEAT TREATMENT AS APPLICABLE.

14. PRE-COMMISSIONING CHECKS/TESTS, TRIAL RUN, TESTING AND COMMISSIONING , STEAM BLOWING, TRIAL OPERATION, PREPARATION AND ASSISTANCE DURING TRIM BALANCING & PG TEST.

THE WORK SHALL CONFORM TO DIMENSIONS AND TOLERANCES SPECIFIED IN THE VARIOUS DRAWINGS/DOCUMENTS THAT WILL BE PROVIDED DURING VARIOUS STAGE OF WORK. IF ANY PORTION OF WORK IS FOUND TO BE DEFECTIVE IN WORKMANSHIP, NOT CONFORMING TO DRAWINGS OR OTHER STIPULATIONS DUE TO CONTRACTOR'S FAULT, THE CONTRACTOR SHALL DISMANTLE AND RE-DO THE WORK DULY REPLACING THE DEFECTIVE MATERIALS AT HIS COST, FAILING WHICH THE WORK WILL BE GOT DONE BY ENGAGING OTHER AGENCIES AND RECOVERIES WILL BE EFFECTED FROM THE CONTRACTOR'S BILLS TOWARDS EXPENDITURE INCURRED INCLUDING DEPARTMENTAL OVERHEADS OF BHEL.

BASED ON DATA AVAILABLE AND PAST HISTORY OF THE MACHINE, THE SCOPE OF WORK FOR RENOVATION, MODERNIZATION, OVERHAULING AND SERVICING OF EQUIPMENT ARE IDENTIFIED/INDICATED AS PER APPENDIX-I. TENTATIVE LIST OF MATERIALS BEING SUPPLIED ARE AS PER APPENDIX-II. CONTRACTOR MAY NOTE THAT THE ITEMS AS PER APPENDIX-II ARE NOT EXHAUSTIVE.

THE DETAILS GIVEN ARE APPROXIMATE AND MEANT ONLY TO GIVE A GENERAL IDEA TO THE TENDERER ABOUT THE MAGNITUDE OF THE WORK INVOLVED. ACTUAL QUANTUM OF WORK / QUANTITIES MAY VARY AFTER DISMANTLING OF THE MACHINE AND INSPECTION OF COMPONENTS. NO SEPARATE COMPENSATION IS PAYABLE FOR ANY/ALL SUCH VARIATIONS OF SCOPE OF WORK FOR REPLACEMENT OF SUCH ADDITIONAL COMPONENTS / EQUIPMENTS. CONTRACTOR'S RATE SHALL BE INCLUSIVE OF ALL SUCH EXIGENCIES.

THE SCOPE OF WORK IS FURTHER DETAILED IN THE SPECIFICATIONS HEREINAFTER.

4.0.2
THE INTENT OF SPECIFICATION IS TO PROVIDE RENOVATION & MODERNIZATION SERVICES ACCORDING TO THE MOST MODERN AND PROVEN TECHNIQUES AND CODES. THE OMISSION OF SPECIFIC REFERENCE TO ANY METHOD, EQUIPMENT OR MATERIAL NECESSARY FOR PROPER AND EFFICIENT EXECUTION OF THE WORK SHALL NOT RELIEVE THE CONTRACTOR OF THE

RESPONSIBILITY OF PROVIDING SUCH FACILITIES TO COMPLETE THE WORK WITHOUT ANY EXTRA COMPENSATION.

4.0.3
THE TERMINAL POINTS DECIDED BY BHEL SHALL BE FINAL AND BINDING ON THE CONTRACTOR FOR DECIDING THE SCOPE OF WORK AND EFFECTING PAYMENT FOR THE WORK DONE.

4.0.4
MACHINING OF COMPONENTS/EQUIPMENTS LIKE KEYS, PALM KEYS PACKERS, DOWEL PINS, SEAL SEGMENTS, CARRIER RINGS ETC. ARE IN THE CONTRACTOR'S SCOPE. HOWEVER, MACHINING OF MAJOR COMPONENTS LIKE ROTOR, PEDESTAL ETC. WHICH ARE OF MAJOR NATURE WILL BE ARRANGED BY BHEL.

4.0.5
THE WORK SHALL BE EXECUTED UNDER THE USUAL CONDITIONS AFFECTING SUCH WORK AND IN CONJUNCTION WITH NUMEROUS OTHER OPERATIONS AT SITE. THE CONTRACTOR SHALL COOPERATE WITH ALL CONCERNED TO ENSURE CONDUCIVE WORK ENVIRONMENT.

4.0.6
CONTRACTOR SHALL EXECUTE THE WORK AS PER THE SEQUENCE & METHODOLOGY PRESCRIBED BY BHEL. THIS WILL BE DECIDED BY THE BHEL ENGINEER DEPENDING UPON THE TECHNICAL REQUIREMENTS, AVAILABILITY OF MATERIALS AND FRONTS. NO CLAIMS FOR EXTRA PAYMENT FROM THE CONTRACTOR WILL BE ENTERTAINED ON THE GROUND OF DEVIATION FROM THE METHODS ADOPTED IN SIMILAR INSTANCES ELSEWHERE.

4.0.7
THE WORK COVERED UNDER THIS SPECIFICATION IS OF HIGHLY SOPHISTICATED NATURE, REQUIRING THE BEST QUALITY WORKMANSHIP, ENGINEERING AND CONSTRUCTION MANAGEMENT.

4.0.8
ALL NECESSARY CERTIFICATES AND LICENSES, PERMITS & CLEARANCES REQUIRED TO CARRY OUT THIS WORK ARE TO BE ARRANGED BY THE CONTRACTOR EXPEDITIOUSLY AT HIS COST.

4.0.9
ALL WORKS SUCH AS CLEANING, LEVELING, ALIGNING, TRIAL ASSEMBLY, DISMANTLING OF EQUIPMENTS/ COMPONENTS FOR CHECKING AND CLEANING, SURFACE PREPARATION, FABRICATION OF SHEETS, TUBES AND PIPES AS PER GENERAL ENGINEERING PRACTICE AND AS PER BHEL ENGINEER'S INSTRUCTIONS AT SITE, CUTTING, WELD DEPOSITING, GRINDING, STRAIGHTENING, CHAMFERING, FILING, CHIPPING, DRILLING, REAMING, SCRAPPING, LAPPING, FITTING UP ETC., AS MAY BE APPLICABLE IN SUCH WORKS AND WHICH ARE TREATED INCIDENTAL TO THE WORKS AND NECESSARY TO COMPLETE THE WORK SATISFACTORILY, SHALL BE CARRIED OUT BY THE CONTRACTOR AS PART OF THE WORK.

4.0.10
AS THIS WORK IS ON EXISTING UNITS, ANY INTERCONNECTION, HOOKUP, REQUIRED WITH EXISTING SYSTEM SHALL FORM PART OF WORK. SUCH INTERCONNECTIONS, HOOKUPS MAY REQUIRE SHUT DOWN OF RUNNING PLANT AND THE RELEVANT WORK HAVE TO BE COMPLETED WITHIN SUCH PLANNED SHUTDOWNS. THIS MAY CALL FOR WORKING WITH ENHANCED RESOURCES AND ON EXTENDED HOURS. CONTRACTOR'S OFFER SHALL COVER ALL SUCH CONTINGENCIES.

4.0.11
THE CONTRACTOR SHALL TAKE DELIVERY OF THE COMPONENTS, EQUIPMENTS, CHEMICALS, LUBRICANTS ETC FROM THE BHEL/CUSTOMER'S STORES/ STORAGE. DETAILED ACCOUNT OF THE EQUIPMENTS ERECTED AS WELL AS THE PROGRESS OF WORK SHALL BE SUBMITTED TO THE BHEL ENGINEER AS DIRECTED.

4.0.12

CONTRACTOR SHALL ENSURE THAT MATERIAL ACCUMULATION AT SITE DOES NOT LEAD TO CONGESTION AT SITE OF WORK. SIMILARLY ALL AREAS OF WORK SHALL BE CLEANED REGULARLY AND DEBRIS REMOVED TO AVOID ACCUMULATION AND CONGESTION. MATERIALS AT SITE SHALL BE STACKED NEATLY. WHERE REQUIRED, RE-STACKING SHALL BE DONE.

4.1 PREPARATION OF FOUNDATIONS, AND GROUTING OF EQUIPMENTS

4.1.1
CONTRACTOR SHALL CARRY OUT SCRAPPING AND BLUE MATCHING OF EMBEDDED PLATES/ PACKERS OF EQUIPMENTS. CHIPPING AND THE BEDDING OF CONCRETE SURFACES, FINELY DRESSING UP TO THE EXTENT REQUIRED TO OBTAIN CONTACT BETWEEN PACKER AND CONCRETE, IS ALSO COVERED IN THE SCOPE OF THIS WORK. SCRAPPING, CHIPPING AND MATCHING SHALL BE DONE SO AS TO ACHIEVE PRESCRIBED PERCENTAGE OF CONTACT.

4.1.2
BHEL WILL PROVIDE NECESSARY PACKERS FOR FITTING WITH EXTRA MARGIN HOWEVER ANY MACHINING REQUIRED SHALL BE DONE BY THE CONTRACTOR. BHEL WILL PROVIDE STEEL PLATES **FOR MAKING OF PACKERS AND FURTHER CUTTING AND MACHINING ETC. TO BE DONE BY THE CONTRACTOR.**

4.1.3
COMPLETE GROUTING OF EQUIPMENTS, INCLUDING ANCHOR/FOUNDATION BOLTS, BENEATH BASE, BASE ETC. AS MAY BE APPLICABLE, IS INCLUDED IN THE SCOPE OF CONTRACTOR. ARRANGING ALL LABOUR, CONSTRUCTION MATERIALS INCLUDING CEMENT, QUICK SETTING – FREE FLOW - NON-SHRINK GROUT MIX (E.G. CONBEXTRA GP2), FORM WORK, SHUTTERING, AND ANY OTHER REQUIREMENTS IS IN THE CONTRACTOR'S SCOPE. CONTRACTOR SHALL OBTAIN APPROVAL OF BHEL FOR CEMENT/GROUT MIX PRIOR TO USE. CLEANING OF FOUNDATION SURFACES, POCKET HOLES AND ANCHOR BOLT PITS AND DE-WATERING AND MAKING THEM FREE OF OIL, GREASE, SAND AND OTHER FOREIGN MATERIALS BY SODA WASHING, WATER WASHING, COMPRESSED AIR AND OTHER APPROVED METHODS, ARE WITHIN THE SCOPE OF THIS SPECIFICATION/WORK. THE SEATING STEEL PLATES OF TG AREA ARE TO BE GROUTED BY THE NON-SHRINKAGE CEMENT AND CEMENT TO BE ARRANGED BY THE CONTRACTOR.

4.1.4
THERE IS NO PROVISION FOR SEPARATE PAYMENT FOR PREPARATION OF FOUNDATION & GROUTING SPECIFIED ABOVE AND RATE QUOTED SHALL INCLUDE THE COST OF THE SAME.

4.2 WELDING INCLUDING ELECTRODES, HEAT-TREATMENT, RADIOGRAPHY AND NON DESTRUCTIVE TESTING

A) THIS WORK INVOLVES GOOD QUALITY WELDING, NDE CHECKS, POST WELD HEAT TREATMENT ETC.

B) ALL THE WELDERS SHALL BE TESTED AND APPROVED BY BHEL ENGINEER BEFORE THEY ARE ACTUALLY ENGAGED ON WORK THOUGH THEY MAY POSSESS PREVIOUS QUALIFICATION CERTIFICATE. BHEL RESERVES THE RIGHT TO REJECT ANY WELDER WITHOUT ASSIGNING ANY REASON.

C) WELD JOINT FIT-UPS, SHOULD BE PROTECTED, WHERE REQUIRED, BY USE OF TAPES/PROTECTIVE PAINT AS MAY BE PRESCRIBED BY BHEL. THE CONTRACTOR SHALL SUPPLY PROTECTIVE PAINT.

SIMILARLY THE WELDED SURFACE SHALL BE CLEANED OF SLAG AND PAINTED WITH PRIMER PAINT TO PREVENT CORROSION. FOR THIS PAINT WILL BE SUPPLIED BY THE CONTRACTOR.

D) PREHEATING, INTER-PASS HEATING, POST WELD HEATING AND STRESS RELIEVING AFTER WELDING ARE PART OF THE WORK AND SHALL BE PERFORMED BY THE CONTRACTOR IN

ACCORDANCE WITH BHEL ENGINEER'S INSTRUCTIONS. NORMALLY THE ELECTRIC RESISTANCE HEATING METHOD WILL BE ADOPTED. CONTRACTOR SHALL ARRANGE ALL T&P AND CONSUMABLES REQUIRED FOR THIS.

E) THE CONTRACTOR SHALL MAINTAIN WELDING RECORDS IN THE FORM AS PRESCRIBED BY BHEL CONTAINING ALL NECESSARY DETAILS, AND SUBMIT THE SAME TO THE BHEL ENGINEER AS REQUIRED. INTERPRETATION OF THE BHEL ENGINEER REGARDING ACCEPTABILITY OF THE WELDS SHALL BE FINAL.

F) RADIOGRAPHY WORK OF WELDS CONNECTED WITH THIS CONTRACT SHALL BE ARRANGED BY THE CONTRACTOR INCLUDING NECESSARY EQUIPMENTS, CONSUMABLES, LABOUR AND MAKING OTHER ARRANGEMENTS SUCH AS PROVIDING SCAFFOLDING, APPROACHES, PLATFORM LIGHTING ARRANGEMENTS, ETC.

G) RADIOGRAPHY INSPECTION OF WELDS SHALL BE PERFORMED IN ACCORDANCE WITH REQUIREMENTS AND RECOMMENDATION OF BHEL ENGINEER. THE QUANTUM OF RADIOGRAPHIC INSPECTION SHALL BE AS PER PROVISION OF IBR/BHEL'S PERTINENT DOCUMENTS.

H) THE FIELD WELDED JOINTS WILL BE SUBJECT TO DYE-PENETRANT/ OTHER NON-DESTRUCTIVE EXAMINATION AS SPECIFIED IN THE RESPECTIVE ENGINEERING DOCUMENTS/ AS INSTRUCTED BY BHEL.

I) WHERE REQUIRED, SURFACE PREPARATION, LIKE SMOOTH GRINDING OF WELDED AREA, PRIOR TO RADIOGRAPHY SHALL BE DONE AS SPECIFIED.

IT MAY ALSO BECOME NECESSARY TO ADOPT INTER-LAYER RADIOGRAPHY/MPT/UT DEPENDING UPON THE SITE/TECHNICAL REQUIREMENT NECESSITATING INTERRUPTIONS IN CONTINUITY OF THE WORK AND MAKING NECESSARY ARRANGEMENTS FOR CARRYING OUT THE ABOVE WORK. THE CONTRACTOR SHALL TAKE ALL THIS INTO ACCOUNT AND QUOTE THE PRICE.

J) SOCKET WELDING :

IN THIS WORK CONSIDERABLE NUMBER OF SOCKET WELD JOINTS IS INVOLVED. THE EXACT QUANTITY OF SUCH SOCKET WELDS OR PROBABLE VARIATION IN THE QUANTUM CANNOT BE FURNISHED. THE TENDERER SHALL TAKE NOTICE OF THIS WHILE QUOTING AS NO EXTRA CLAIM ON THIS ACCOUNT WILL BE ENTERTAINED AT A LATER DATE.

K) WELDING ELECTRODES HAVE TO BE STORED IN ENCLOSURES HAVING TEMPERATURE AND HUMIDITY CONTROL ARRANGEMENT. THIS ENCLOSURE SHALL MEET BHEL SPECIFICATIONS.

L) WELDING ELECTRODES, PRIOR TO THEIR USE, CALL FOR BAKING FOR SPECIFIED PERIOD AND WILL HAVE TO BE HELD AT SPECIFIED TEMPERATURE FOR SPECIFIED PERIOD. ALSO, DURING EXECUTION, THE WELDING ELECTRODES HAVE TO BE CARRIED IN PORTABLE OVENS.

4.3 GENERAL RESPONSIBILITY OF THE CONTRACTOR

4.3.1
THE CONTRACTOR SHALL HAVE TOTAL RESPONSIBILITY FOR ALL EQUIPMENT AND MATERIALS IN HIS CUSTODY AT CONTRACTOR'S STORES, LOOSE, SEMI-ASSEMBLED, ASSEMBLED OR ERECTED BY HIM AT SITE. HE SHALL EFFECTIVELY PROTECT THE
FINISHED WORKS FROM ACTION OF WEATHER AND FROM DAMAGES OR DEFACEMENT AND SHALL ALSO COVER THE FINISHED PARTS IMMEDIATELY ON COMPLETION OF WORK AS PER BHEL ENGINEER'S INSTRUCTIONS. THE MACHINED SURFACES/FINISHED SURFACES SHOULD BE GREASED AND COVERED.

4.3.2 PRESERVATION & PROTECTION OF COMPONENTS

AT ALL STAGES OF WORK, EQUIPMENTS/MATERIALS IN THE CUSTODY OF CONTRACTOR, INCLUDING THOSE ERECTED, WILL HAVE TO BE PRESERVED AS PER THE INSTRUCTIONS OF BHEL. NECESSARY PRESERVATION AGENTS, EXCEPTING THE PRIMER & PAINT, FOR THE ABOVE WORK SHALL BE PROVIDED BY BHEL.

4.3.3
THE CONTRACTOR SHALL MAKE SUITABLE ARRANGEMENTS TO ENSURE SECURITY AND PROTECTION OF ALL MATERIALS/EQUIPMENT IN HIS CUSTODY AND INSTALLED EQUIPMENTS FROM THEFT/FIRE/PILFERAGE AND ANY OTHER DAMAGES AND LOSSES.

4.3.4
THE CONTRACTOR SHALL NOT WASTE ANY MATERIALS ISSUED TO HIM. IN CASE IT IS OBSERVED AT ANY STAGE THAT THE WASTAGE/EXCESS UTILIZATION OF MATERIALS IS NOT WITHIN THE PERMISSIBLE LIMITS, RECOVERY FOR THE EXCESS QUANTITY USED OR WASTED WILL BE EFFECTED WITH DEPARTMENTAL CHARGES FROM THE
CONTRACTOR. DECISION OF BHEL ON THIS WILL BE FINAL AND BINDING ON THE CONTRACTOR.

4.3.5
WHEREVER REQUIRED LOCKING/ ARRESTING OF EXISTING SYSTEM AND/OR PROVIDING TEMPORARY SUPPORTS OR ANY OTHER SUCH ARRANGEMENT TO RETAIN THE OTHER PART OF THE SYSTEM IN EXISTING/DESIRED STATE/ POSITION. CONTRACTOR SHALL MAKE ALL SUCH ARRANGEMENT AS PART OF WORK AND HIS OFFER SHALL INCLUDE SUCH CONTINGENCIES AS NO SEPARATE PAYMENT IS ENVISAGED FOR SUCH ARRANGEMENTS. THE MATERIAL REQUIRED FOR SUCH ARRANGEMENTS SHALL BE PROVIDED BY THE CONTRACTOR.

4.3.6
WHEREVER REQUIRED, HYDRAULIC TEST OF PIPING, HEATERS, COOLERS, CONDENSER ETC SHALL BE CONDUCTED AS PART OF WORK.

4.3.7
ALL LUBRICANTS, CHEMICALS FOR TESTING, PRESERVATION AND LUBRICANTS FOR TRIAL RUNS OF THE EQUIPMENTS SHALL BE SUPPLIED BY BHEL. CONTRACTOR SHALL DRAW THESE FROM BHEL/CUSTOMER'S STORES & TRANSPORT TO SITE. HANDLING, FILLING, EMPTYING, RE-FILLING, ACCOUNTING AND RETURN OF BALANCE QUANTITY/ EMPTY CONTAINERS ETC ARE PART OF WORK.

4.3.8
TRIAL RUN OF THE DRIVE IN UN-COUPLED STATE AND THEN COUPLED WITH EQUIPMENT HAS TO BE DONE AFTER NECESSARY ALIGNMENT ETC.

4.4.SPRAY & OTHER INSULATION

4.4.1
REMOVAL OF CLADDING / SHEETING, INSULATION OF VARIOUS EQUIPMENTS INCLUDING THE SPRAY INSULATION ON TURBINE CASING, STRAINER AND VALVES & PIPINGS. CLADDING SHEET AND INSULATION DAMAGED IN VARIOUS AREAS ARE TO BE REPLACED BY THE CONTRACTOR WITHOUT ANY EXTRA COST TO BHEL. REPLACEMENT OF ANY DAMAGE CLADDING / SHEETING REPLACEMENT IS PART OF THE CONTRACT

4.4.2 SUPPLY AND APPLICATION OF SPRAY INSULATION

COMPLETE SUPPLY AND APPLICATION OF SPRAY INSULATION FOR HP TURBINE, IP TURBINE, CIES VALVES, IV VALVES AND STRAINERS IS COVERED IN THE SCOPE OF WORK.

4.4.3

THE INSULATION AND SHEETING ON VARIOUS COMPONENTS OF TG AUX & PIPINGS INCLUDING VALVES AT VARIOUS LOCATIONS WHICH ARE REMOVED / HAVE GOT DAMAGED WHICH NEED TO BE REPAIRED/ TO BE REPLACED BY FRESH INSULATION AS REQUIRED. THESE WILL BE PART OF WORK.THE APPLICATION OF INSULATION INCLUDING CLADDING / SHEETING FOR VARIOUS COMPONENTS OF TOTAL TG AUX & PIPINGS ARE ALSO COVERED IN THE SCOPE OF WORK. WOOL MATTRESSES, IRON COMPONENTS, CLADDING ETC FOR APPLICATION OF INSULATION FOR ABOVE REQUIREMENT SHALL BE ARRANGED BY THE CONTRACTOR WITHIN THE QUOTED PRICE.ANY DAMAGE OF INSULATION ON PIPING,VALVE,HEATERS,DE-AERATOR,GLAND COOLER HAS TO BE ASSESSED AND MUTUALLY AGREED AT SITE.BHELDECISION SHALL BE FINALLY AND CONTRACTOR HAS TO CARRY OUT TOTAL INSULATION JOB INCLUDING SUPPLY OF MATERIAL WITHIN QUOTED RATE.

4.5.0 TESTING, PRE-COMMISSIONING, AND COMMISSIONING.

4.5.1
TESTING, PRE-COMMISSIONING, & COMMISSIONING WILL INVOLVE, THOUGH NOT LIMITED TO THESE, VARIOUS TESTING, TRIAL RUNS OF VARIOUS EQUIPMENTS ERECTED AND SYSTEMS INSTALLED. FLUSHING OF THE LINES INCLUDING EXTRACTION & DRAIN LINES BEFORE ASSEMBLY BY WATER, AIR, OIL, STEAM AS THE CASE MAY BE, CHEMICAL CLEANING OF VARIOUS SYSTEMS & PIPING ETC., ARE SOME OF THESE ACTIVITIES. ALL THE ACTIVITIES FOR COMMISSIONING OF THE SET, AS INFORMED BY BHEL FROM TIME TO TIME SHALL BE COMPLETED.

4.5.2
ALL THE ABOVE TESTS SHOULD BE REPEATED TILL ALL THE EQUIPMENTS SATISFY THE REQUIREMENT/ OBLIGATIONS OF BHEL TO THEIR CLIENT AND ALSO THE RELEVANT STATUTORY AUTHORITY.

4.5.3
CONTRACTOR SHALL LAY/INSTALL NECESSARY TEMPORARY PIPING, PUMPS, VALVES, GAUGES, CABLES, SWITCHES ETC., FOR CONDUCT OF HYDRAULIC TEST, CHEMICAL CLEANING, STEAM BLOWING ETC. THIS MAY INVOLVE CUTTING AND RESTORATION OF SOME PORTION OF EXISTING PIPING/VALVES AS PART OF WORK.

4.5.4
ALL MATERIALS, EQUIPMENTS NECESSARY FOR INSTALLATION OF TEMPORARY SYSTEM AS ABOVE WILL BE SUPPLIED BY BHEL IN RANDOM SIZES/LENGTHS. HOWEVER, SERVICING, FABRICATION, ERECTION, DISMANTLING OF THE SAME AFTER COMPLETION OF THE PROCESS, AND HANDING OVER BACK TO BHEL STORES WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.

4.5.5
FABRICATION, FIT-UP, CUTTING & WELDING, AND POST-WELD-HEAT TREATMENT IF ANY, OF REQUISITE BLANKS FOR CONDUCT OF OIL FLUSHING, STEAM BLOWING, DRAIN & EXTRACTION LINES CLEANING & HYDRAULIC TEST ARE PART OF WORK. SIMILARLY, REMOVAL OF BLANKS, RESTORATION AND NORMALIZATION OF THE CONCERNED SYSTEM/LINE IS TO BE DONE AS PART OF WORK. BHEL WILL PROVIDE THE MATERIAL FOR BLANKS FREE OF CHARGE.

4.5.6
IN CASE ANY DEFECT IS NOTICED DURING TESTS, TRIAL RUNS OF TG & ITS AUXILIARIES THE CONTRACTOR SHALL IMMEDIATELY ATTEND TO THESE DEFECTS AND TAKE NECESSARY CORRECTIVE MEASURES. IF ANY READJUSTMENT AND REALIGNMENT ARE NECESSARY, THE SAME SHALL BE DONE AS PER BHEL ENGINEER'S INSTRUCTIONS.

4.5.7
COMMISSIONING ACTIVITIES WILL CONTINUE TILL THE COMPLETION OF TRIAL OPERATION. DURING THIS PERIOD CONTRACTOR SHALL MAKE AVAILABLE THE SERVICES OF SEPARATE DEDICATED LABOR FORCE COMPRISING OF SUITABLY SKILLED AND SEMI/UN-SKILLED HANDS ALONG WITH NECESSARY TOOLS AND PLANTS, CONSUMABLES ETC.

4.5.8
IT SHALL BE SPECIFICALLY NOTED THAT THE CONTRACTOR MAY HAVE TO WORK ROUND THE CLOCK ALONG WITH BHEL ENGINEERS AND HENCE CONSIDERABLE OVERTIME PAYMENT IS INVOLVED. THE CONTRACTOR'S OFFER SHALL BE INCLUSIVE OF ALL THESE FACTORS.

4.5.9
THE CONTRACTOR SHALL CARRY OUT ANY OTHER TESTS AS DESIRED BY BHEL ENGINEER ON EQUIPMENTS COVERED UNDER THE SCOPE OF THIS CONTRACT TO DEMONSTRATE THE COMPLETION OF ANY PART OR WHOLE OF WORK PERFORMED BY THE CONTRACTOR.

4.6
CONTRACTOR'S RESPONSIBILITIES WITH REGARD TO HIS RESOURCES TO BE DEPLOYED FOR THIS WORK

4.6.1
ALL TOOLS, TACKLES, FIXTURES, SCAFFOLDINGS, EQUIPMENTS, MATERIALS HANDLING AND TRANSPORTATION EXCEPT THOSE SPECIFICALLY TO BE PROVIDED BY BHEL, MANPOWER, SUPERVISORS/ ENGINEERS. THESE TOOLS & PLANT, EQUIPMENTS, MEN & MATERIAL SHALL REMAIN AT SITE THROUGHOUT THE DURATION OF CONTRACT AND EXTENSION THEREOF, IF ANY. DIVERSION/REMOVAL OF THESE SHALL BE DONE ONLY ON THE APPROVAL OF BHEL.

4.6.2
IN THE EVENT OF CONTRACTOR FAILING TO ARRANGE THE REQUIRED RESOURCES IN HIS SCOPE, BHEL WILL MAKE THE ALTERNATE ARRANGEMENT AT THE RISK AND COST OF THE CONTRACTOR.

4.6.3 CONSUMABLES

THE CONTRACTOR SHALL PROVIDE ALL CONSUMABLES INCLUDING SPECIAL CONSUMABLES LIKE CILASTIC COMPOUND, MOLYKOTE, HYLOMAR/GOLDEN HERMODITE, STAG-B (STEAM SEALING) AND M-SEAL COMPOUND ETC. REQUIRED FOR THE TOTAL WORK SHALL BE ARRANGED BY THE CONTRACTOR WITHIN THE QUOTED PRICE.
ALL CONSUMABLES REQUIRED FOR CARRYING OUT THE WORK COVERED UNDER THESE SPECIFICATIONS EXCEPTING THOSE WHICH ARE SPECIFICALLY INDICATED AS BHEL SCOPE. WHERE REQUIRED, CONSUMABLES PROVIDED BY CONTRACTOR SHALL HAVE BHEL'S APPROVAL.

4.6.9 STATUTORY INSPECTION OF WORK

THE WORK TO BE EXECUTED UNDER THESE SPECIFICATIONS HAS TO BE OFFERED FOR INSPECTION, AT APPROPRIATE STAGES OF WORK COMPLETION, TO VARIOUS RELEVANT STATUTORY AUTHORITIES TO SHOW COMPLIANCE WITH APPLICABLE REGULATIONS. ALSO REFER GENERAL CONDITIONS OF CONTRACT IN THIS REGARD.

4.6.11 SAFETY

4.6.11.1
THE CONTRACTOR SHALL TAKE ALL NECESSARY SAFETY PRECAUTIONS AND ARRANGE FOR APPROPRIATE SAFETY EQUIPMENTS TO PREVENT LOSS OF HUMAN LIVES, INJURIES TO MEN ENGAGED AND DAMAGE TO PROPERTY ETC.

4.6.11.2
THE CONTRACTOR SHALL PROVIDE TO HIS WORK FORCE & ENSURE THE USE OF THE PERSONAL PROTECTION EQUIPMENT SUCH AS SAFETY HELMETS, SAFETY SHOES, FACE AND EYE PROTECTION EQUIPMENT ETC; APPROPRIATE TO THE WORK.

4.6.11.3
ALL TOOLS, TACKLES, LIFTING APPLIANCES, MATERIAL HANDLING EQUIPMENT, SCAFFOLDS, CRADLES, SAFETY NETS, LADDERS, EQUIPMENT, ETC. USED BY THE CONTRACTOR SHALL BE OF SAFE DESIGN AND CONSTRUCTION. WHEREVER APPLICABLE TEST CERTIFICATES FOR THE FITNESS OF THESE SHALL BE FURNISHED. BHEL WILL HAVE THE RIGHT TO BAN THE USE OF ANY ITEM FOUND UNSUITABLE.

4.6.11.4
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.

4.6.11.5
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 ANOTHER 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.

4.6.11.6
IN CASE OF A FATAL OR DISABLING INJURY/ACCIDENT TO ANY PERSON AT CONSTRUCTION SITES DUE TO LAPSES BY THE CONTRACTOR, THE VICTIM AND/OR HIS/HER DEPENDENTS SHALL BE COMPENSATED BY THE CONTRACTOR AS PER STATUTORY REQUIREMENTS. HOWEVER, IF CONSIDERED NECESSARY, BHEL SHALL HAVE THE RIGHT TO IMPOSE APPROPRIATE FINANCIAL PENALTY ON THE CONTRACTOR AND RECOVER THE SAME FROM PAYMENTS DUE TO THE CONTRACTOR FOR SUITABLY COMPENSATING THE VICTIM AND/OR HIS/HER DEPENDENTS. BEFORE IMPOSING ANY SUCH PENALTY, APPROPRIATE ENQUIRY SHALL BE HELD BY BHEL GIVING OPPORTUNITY TO THE CONTRACTOR TO PRESENT HIS CASE.

4.6.11.7
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.

4.6.11.8
IF SAFETY RECORD OF THE CONTRACTOR IN EXECUTION OF THE AWARDED JOB IS TO THE SATISFACTION OF SAFETY DEPARTMENT OF BHEL, ISSUE OF AN APPROPRIATE CERTIFICATE TO RECOGNIZE THE SAFETY PERFORMANCE OF THE CONTRACTOR MAY BE CONSIDERED BY BHEL AFTER COMPLETION OF THE JOB.

4.6.11.9
CONTRACTOR SHALL SUBMIT A DETAILED SAFETY PLAN TO BHEL SITE IN CHARGE
BEFORE START OF WORK

4.7
BIDDER MUST ENSURE THAT THE MANPOWER REQUIRED FOR COMPLETION OF THIS WORK SHALL BE ADEQUATE, QUALIFIED AND EXPERIENCED . IN CASE INSUFFICIENT MANPOWER DEPLOYED BY THE CONTRACTOR, BHEL WILL ASK BIDDER TO FULFILL THE MANPOWER AS PER SITE REQUIREMENT.

4.8
BIDDERS MUST SUBMIT ALL RELEVANT DOCUMENT AS PER THIS TENDER SPECIFICATION AND AS PER QUALIFYING REQUIREMENT (QR) OF NIT. BIDDER MUST VISIT OUR WEB SITE www.bhel.com FOR NIT, TECHNICAL SPECIFICATION, BOQ, AMENDMENTS ETC TO KEEP UPDATED FOR ANY CHANGES/ AMENDMENTS. INCOMPLETE DOCUMENT SUBMITTED BY BIDDER SHALL NOT BE CONSIDER FOR EVALUATION .

SECTION-5

SPECIAL CONDITIONS OF CONTRACT

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

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

BHEL/Client will be providing only the space for labour colony. Contractor shall make his own arrangements for accommodation with necessary facilities such as drinking water, sanitation and lighting etc for his workmen and the staff. The electricity for labour accommodation shall be on chargeable basis on the prevailing rate basis. taxes, duties, levies over and above the rates etc shall also be born by the contractor. Also, the contractor has to make his own arrangement for transportation of his workmen and other employees. BHEL/client shall not provide any facility in this regard.

5.2 TOOLS AND TACKLES, MEASURING AND MONITORING DEVICES:

5.2.1

BHEL WILL NOT PROVIDE ANY CRANE , TRAILER, T&PS ETC. CONTRACTOR HAS TO MAKE HIS OWN ARRANGEMENTS FOR ALL SUCH REQUIREMENTS.

4.7.4.2

SPECIAL TOOLS WHICH ARE SUPPLIED BY BHEL AS PART OF MAINTENANCE TOOLS TO BE HANDED OVER TO CUSTOMER UNDER REGULAR DU/DESS NUMBERS IN VARIOUS PRODUCT GROUPS MAY BE ISSUED TO THE CONTRACTOR FREE OF CHARGES FOR SPECIFIC ACTIVITIES, AT THE DISCRETION OF BHEL. CONTRACTOR SHALL RETURN THEM AFTER THE COMPLETION OF THE SPECIFIC ACTIVITY FOR WHICH THE TOOLS WERE SPARED, IN GOOD WORKING ORDER.

4.7.4.3

THE CONTRACTOR MUST NOT USE THESE EQUIPMENTS FOR ANY PURPOSE OTHER THAN WHAT THEY ARE INTENDED FOR. MISUSE, IF ANY, WILL RESULT IN PENALTY.

4.7.4.4

IF THE ABOVE ITEMS ISSUED TO CONTRACTOR ARE FOUND NOT UTILISED/NOT MAINTAINED TO THE SATISFACTION OF BHEL ENGINEER OR MISUSED, THESE WILL BE WITHDRAWN AND NO REPLACEMENT WILL BE DONE FOR SUCH ITEMS.

4.7.5

REQUIRED TEMPORARY STRUCTURAL STEEL, PIPES & FITTINGS, VALVES FOR INSTALLATION OF TEMPORARY SYSTEM FOR CONDUCT OF HYDRAULIC TEST, CHEMICAL CLEANING/STEAM BLOWING/OIL FLUSHING/ACID CLEANING ETC. SHALL BE PROVIDED BY BHEL FREE OF CHARGE SUBJECT TO AVAILABILITY AT SITE. HOWEVER FOR ANY ADDITIONAL REQUIREMENT, CONTRACTOR SHALL ARRANGE THE SAME AT THEIR OWN COST.

4.7.6

ALL AVAILABLE DRAWINGS, DOCUMENTS, SPECIFICATIONS, ONE COPY OF WHICH WILL BE MADE AVAILABLE TO THE CONTRACTOR AS AND WHEN REQUIRED. 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.

4.7.7
IN CASE OF ANY CONFLICT BETWEEN GENERAL INSTRUCTIONS TO TENDERERS AND GENERAL CONDITIONS OF CONTRACT CONTAINED IN SECTIONS 1 & 2 RESPECTIVELY AND OTHER SPECIAL CONDITIONS OF CONTRACT CONTAINED IN SECTIONS 4 TO 6 AND APPENDICES, PROVISIONS CONTAINED IN SECTIONS 4 TO 6 AND APPENDICES SHALL PREVAIL.

The contractor shall provide all (in addition to those in BHEL scope) required tools and plants, monitoring and measuring devices (MMD) and handling & transportation equipments for the scope of work covered under these specifications. contractor has to provide suitable cranes for material handling at BHEL/client's stores/storage yard. BHEL's crane will not be available for this purpose other than specified. please refer relevant A**ppendix** for the list of T&P being provided by BHEL free of charges on sharing basis.

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

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

5.2.4
All tools and tackles to be deployed by the contractor for the work shall have the prior approval of BHEL engineer with regard to brand, quality and specification. The indicative list of major T&P to be arranged by the contractor has been furnished in relevant appendix. Contractor shall also mobilize all other T&P as necessary for timely and satisfactory completion of the work in scope.

5.2.5
BHEL shall not provide any Chemical Cleaning /Flushing pump / equipment as required for Chemical cleaning/flushing of piping and related equipments / system. However these Chemical pumps are kept under the scope of Boiler erection agency as part of their scope of work. Contractor for convenience of work, may decide and discuss with Boiler agency to avail the services of their arrangements and after their consent, shall settle the commercial issue directly or shall have to make his own arrangement of required capacity Chemical cleaning pumps with all aux. & accessories for satisfactory completion of activity. However, contractor shall arrange / provide the required Chemical cleaning arrangements as per requirement and instructions of BHEL engineer without any delay/lapse.

5.2.6
Timely deployment of adequate quantity of T & P is the responsibility of the contractor. The contractor shall be prepared to augment the T & P at short notice to match the planned programme and to achieve the milestones.

5.2.7
Complete set of hydraulic jacks of 50 tonnes and 100 tonnes capacity shall be arranged by the contractor for use during erection and commissioning of Turbine. Also, hydraulic jacks of 100 tonnes and 63 tonnes capacity along with long high pressure hoses of suitable length for Generator erection and alignment shall be arranged by the contractor. These jacks shall of internationally reputed make, highly reliable and maintained in excellent working condition.

They shall be tested for safe working before deploying in actual work. These jacks shall not be permitted for use anywhere other than Steam Turbine / Generator area.

5.2.8
All jack bolts that are required during erection for carrying out roll-check etc. will have to be arranged by the contractor. No jack bolts will be provided by BHEL.

5.2.9
Contractor shall maintain and operate his tools and plants in such a way that major breakdowns are avoided. In the event of major breakdown, contractor shall make alternative arrangements expeditiously so that the progress of work is not hampered.

5.2.10
In the event of contractor failing to arrange the required tools, plants, machinery, equipment, material or non-availability of the same owing to breakdown, BHEL will make the alternative arrangement at the risk and cost of the contractor.

5.2.11
The T&P to be arranged by the contractor shall be in proper working condition and their operation shall not lead to unsafe condition. Contractor shall obtain prior approval of BHEL for all the T&P before deploying in actual work. The movement of cranes, and other equipment should be such that no damage / breakage occurs to foundations, other equipments, material, property and men. All arrangements for the movement of the T&P etc shall be the contractor's responsibility. The necessary test certificates for Equipments to be submitted.

5.2.12

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

5.2.13
The contractor at his cost shall carry out periodical testing of his construction equipments and calibration of Measuring & Monitoring Devices (MMD). Test / Calibration certificates shall be furnished to BHEL. MMD shall be calibrated only at accredited laboratory as per the list available with BHEL or any other laboratory approved by BHEL. All calibration shall be traceable to national or international standards.

5.2.14
BHEL T&P will be issued in basic assembled condition; contractor shall transport these T&P to & fro between BHEL stores and site. Additional loose components/ sub-assemblies / attachments as and when necessary, will be issued by BHEL, to & fro movement between BHEL stores and site of such items shall also be done by the contractor. Assembly of such additional loose components/sub-assemblies/ attachments is in contractor's scope. Any boom reduction/ extension of BHEL cranes for contractor's use and restoration to previous state or as directed by BHEL shall be the contractor's responsibility. Contractor shall provide all enabling services with tools and tackles for assembly/dismantling and boom extension/reduction as above.

5.3 CONSUMABLES

5.3.1

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

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

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

5.3.3 PRIMERS & PAINTS

BHEL will provide paint & primer for only the specified areas herein; all other requirements are in contractor's scope.

5.4 WELDING ELECTRODES, TIG WELDING FILLER WIRES AND GASES

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

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

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

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

5.5 FIELD OFFICE

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

5.5.2
On completion of work, all the temporary buildings, structures, pipelines, cables, etc shall be dismantled and leveled and debris shall be removed as per instruction of BHEL by the contractor at his cost. In the event of his failure to do so, BHEL will arrange to remove and expenditure thereof including overhead expenses (presently @30%) will be recovered from the contractor. The decision of BHEL engineer in this regard shall be final. However, the

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

5.6 AREA LIGHTING

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

5.7 CONSTRUCTION POWER & WATER

5.7.1
Construction power (three phase, 415v / 440v, will be provided at single point chargeable basis. BY GSECL. All taxes, duties, levies, charges etc, as applicable, shall also be born by the contractor. Accordingly, required energy meter, all cables, fuses, distribution boards, switches, switchboards, bus bars, earthing arrangements, protection devices e.g. ELCB, if any, and any other installation as specified by Statutory Authority, Client
in this regard, for drawl of construction power shall be arranged by the contractor. Obtaining approvals, payment of necessary fees, duties etc towards the clearance of such installations, if any, prior to these being put to use or as may be specified, shall be the responsibility of the contractor.

5.7.2
It shall be the responsibility of the contractor to provide, maintain the complete installation on the load side of the supply with due regard to the safety requirements at site. All cabling and installations shall comply in all respects with the appropriate statutory requirements. The installation and maintenance of this shall be done by licensed and experienced Electrician.

5.7.3
The Customer will provide **water for Construction purpose** at a single point free of charge. However, Taxes, Duties, Levies, charges if any shall be borne by the contractor. All arrangements for further distribution beyond this point have to be made by contractor.

5.7.4
In case of non-availability of customer supplied power, it is the responsibility of the contractor to make alternative arrangements for back-up power supply arrangement like DG set and Diesel operated welding machine etc. to tackle the situations arising due to failure of customer supply power, so as to ensure continuity and completion of critical processes that are underway at the tine of power failure or important activities planned in immediate future.

5.7.5
BHEL is not responsible for any loss or damage to the contractor's equipment as a result of variations in voltage or frequency or interruptions in power supply. Contractor shall take suitable insurance policy for such accidental loss/ damages.

5.8 RESPONSIBILITIES WITH REGARD TO LABOUR EMPLOYMENT ETC.

5.8.1
Refer clause 2.8 of General Conditions of Contract in this regard.

5.8.2
Contractor shall also comply with the requirements of local authorities/ project authorities calling for police verification of antecedents of the workmen, staff etc.

5.8.3
BHEL / customer may insist for witnessing the regular payment to the labour. They may also like to verify the relevant records for compliance with statutory requirements. Contractor shall enable such facilities to BHEL / customer.

5.8.4
It is the responsibility of the contractor to arrange gate pass for all his employees, T&P etc for entering the project premises. Necessary coordination with customer officials is the responsibility of the contractor. Contractor to follow all the procedures laid down by the customer for making gate passes. Where permitted, by customer / BHEL, to work beyond normal working hours, the contractor shall arrange necessary work permits for working beyond normal working hours.

5.8.5
Contractor shall provide at different elevation suitable arrangement for urinal and drinking water facility with necessary plumbing & disposal arrangements including construction of septic tank. These installations shall be maintained in hygienic condition at all times.

5.8.6
If at any time during the execution of work, it is noticed that the work is suffering on account of non-availability/shortfall in provision of resources from the contractor's side BHEL will make suitable alternate arrangements at the risk and cost of contractor. The expenditure incurred with overheads thereby shall be recovered from the contractor.

5.9 TAXES, DUTIES, LEVIES

5.9.0

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 and 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.

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 Sales Tax /WCT

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

5.9.4 Modalities of Tax Incidence on BHEL

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

5.9.5 New Taxes/Levies

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

In case any 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.

5.9 SUBMISSION OF PERIODICAL REPORTS

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

1) Consumption of consumables like welding electrodes, gases and paints
2) Consumption of construction power
3) Availability and utilization of BHEL's Tools & Plants

4) Availability and utilization of contractor's Tools & Plants
5) Daily manpower reports
6) Daily progress reports of activities & incidents
7) Calibration reports
8) Records of wages payment
9) Any other report/record as may be specified by BHEL/client.

BHEL at site will suggest formats for these reports.

5.10

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

SECTION-6

SPECIAL CONDITIONS OF CONTRACT

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

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

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

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

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

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

6.6
If at any time, it is found that the contractor is not in a position to deploy the required engineers/supervisors/workmen due to any reason, BHEL shall have the option to make alternate arrangements at the contractor's risk and cost.

6.7 SITE ORGANISATION

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

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

SECTION-7

SPECIAL CONDITIONS OF CONTRACT

7.0 OBLIGATIONS OF BHEL

7.1 FACILITIES TO BE PROVIDED BY BHEL

7.1.1 Space for site office / stores

Refer section-5 in this regard.

7.1.2 Construction Power & Water

Refer Section-5 in this regard.

7.1.3 Other materials and consumables:

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

7.1.4 TEST MATERIALS (PLATES & PIPES)

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

7.2 FILLER WIRE FOR TIG WELDING

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

7.3 EQUIPMENTS – TOOLS & PLANTS

BHEL will make available only those T&P that are listed in **Appendix-IV** free of charge. All other required T&P shall be arranged by the contractor. Further details are as under:

CRANES , TRAILERS , T&PS ETC

BHEL will not provide any crane, trailers , any T&P except special T&P as specified in this tender. As such contractor has to make his own arrangement for all such requirement

7.4 OTHER T&P

7.4.1

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

7.4.3

Lubricants like engine oil, Cadmium compound, hydraulic oil, gear oil, grease etc for BHEL's T&P will be provided by BHEL free of charge. All other consumables like cotton waste, cleaning agents etc shall be in the contractor's scope.

7.4.4
BHEL engineer will inspect all the tools and plants issued to contractor periodically. In case contractor fails to make good, the damages caused, BHEL will do the same at contractor's cost. The tools and tackles will be issued only to persons nominated by the contractor.

7.4.5
Required temporary structural steel, pipes & fittings, valves for conducting hydraulic test, chemical cleaning / steam blowing / oil flushing / acid cleaning etc shall be provided by BHEL on returnable basis.

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

7.5.1

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

SECTION-8

SPECIAL CONDITIONS OF CONTRACT

8.0 INSPECTION / QUALITY ASSURANCE / QUALITY CONTROL/ STATUTORY INSPECTION

8.1

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

8.2

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

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

8.3

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

8.4

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

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

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

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

8.5

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

8.6

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

8.7

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

8.8

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

8.9

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

8.10

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

8.11

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

8.12 STAGE INSPECTION BY FES / QA ENGINEERS

8.12.1

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

8.12.2

Any modifications suggested by BHEL FES and QA Engineers team shall be carried out. Claims of contractor, if any, shall be dealt as per clause 13.1 to 13.8, provided such modifications have not arisen for reasons attributable to the contractor.

13 .STATUTORY INSPECTION.

8.13.1

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

8.13.2

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

8.13.3

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

8.13.4

Refer clause No.2.8.5 of SECTION-2 OF GENERAL CONDITIONS OF CONTRACT for BHEL's responsibility with regard to payment of Inspection fee of Boiler Inspectorate.

8.13.5

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

8.14

The quality management system of BHEL, Power Sector – Western Region (PSWR) has already been certified and accredited with ISO 9001:9002 standards in this regard. The basic philosophy of the Quality Management System is to define the organisational responsibility, work as per documented procedures, verify the output with respect to acceptance norms, identify the non-conforming product/procedure and take corrective action for removal of non-conformance specifying the steps for avoiding recurrence of such non-conformities, and maintain the relative quality records. The non-conformities are to be identified through the conduct of periodical audit of implementation of Quality Systems at various locations/stages of work. Suppliers/vendors of various products/services contributing in the work are also considered as part of the Quality Management System. As such the contractor is expected not only to conform to the Quality Management System of BHEL but also it is desirable that they themselves are accredited under any Quality Management system Standard.

Section-9

Special Conditions of Contract

Safety, Occupational Health and Environmental Management

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

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

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

9.1.3 Abide by the Procedure governing entry/exit of the contractor's personnel within the Customer/Client premises. All the contractors employees shall be permitted to enter only on displaying of authorized Photo passes or any other documents as authorised 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 authorised 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 authorised 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 authorised 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 energised 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 authorised 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 authorised 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 authorised persons holding relevant license will drive and operate site plant and equipments eg cranes, dumpers, excavators, transport vehicles etc

9.2.1.15 Only authorised 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 victim and/or his/her dependents shall be compensated by the contractor as per statutory requirements. However, if considered necessary, BHEL shall have the right to impose appropriate financial penalty on the contractor and recover the same from payments due to the contractor for suitably compensating the victim and/or his/her dependents. Before imposing any such penalty, appropriate enquiry shall be held by BHEL giving opportunity to the contractor to present his case.

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

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

9.2.1.25 If the contractor fails to improve the standards of safety in its operation to the satisfaction of BHEL after being given a reasonable opportunity to do so, and/or if the contractor fails to take appropriate safety precautions or to provide necessary safety devices and equipment or to carry out instructions regarding safety issued by the authorised 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**

9.2.1.15.1 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 mobilisation of personnel and equipment, and defining the responsibilities of the personnel indicated, in order to prepare for any emergency that may arise in order to ensure the priorities of

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

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

9.2.1.15.2 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 organised 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 focussed

- 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

9.2.4 ENVIRONMENT MANAGEMENT

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

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.

9.6.1
BHEL Engineers shall carry out inspections regularly by the contractors and on activities, facilities, equipment and 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 Co-ordinator 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 Extinguisher	To check pressure and any defect	User / Safety Coordinator	Daily Every month
4	Lifting equipment/tacles	To check for defects and efficacy of brakes	User Third party	Daily Every Year
5	PPE	To check for defects	User	Daily

9.7 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**:

SN	Violation of Safety Norm	Fine (Rs.)
01	Not Wearing Safety Helmet	50/-
02.	Not wearing Safety Belt	100/-
03.	Grinding Without Goggles	50/-
04.	Not using 24 V Supply For Internal Work	500/-
05.	Electrical Plugs Not used for hand Machine	100/-
06.	Not Slinging property	200/-
07.	Using Damaged Sling	200/-
08.	Lifting Cylinders Without Cage	500/-
09.	Not Using Proper Welding Cable With Lot of Joints And Not Insulated Property.	200/-
10.	Not Removing Small Scrap From Platforms	200/-
11.	Gas Cutting Without Taking Proper Precaution or Not Using Sheet Below Gas Cutting	200/-
12.	Not Maintaining Electric Winches Which are Operated Dangerously	500/-
13.	Improper Earthing Of Electrical T&P	500/-
14.	Accident Resulting in Partial Loss in Earning Capacity	25,000/- per victim
15.	Fatal Accident/Accidents Resulting in total loss in Earning Capacity	1,00,000/- per victim

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

9.8

CITATION:-If safety record of the contractor in execution of the awarded job is to the satisfaction of safety department of BHEL, issue of an appropriate certificate to 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:

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 authorised representative of M/s----------

Name :

Place & Date:

9.10

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

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

IS No	YEAR	Amd upto	DESCRIPTION
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 No	YEAR	Amd upto	DESCRIPTION
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 No	YEAR	Amd upto	DESCRIPTION
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 No	YEAR	Amd upto	DESCRIPTION
IS 9759	1981		GUIDELINES FOR DEWATERING DURING CONSTRUCTION
IS 9815	1989		SERVO MOTOR OPERATED LINE VOLTAGE CORRECTOR (SERVO STABILISER)
IS 9944	1992		RECOMMENDATIONS ON SAFE WORKING LOAD FOR NATURAL AND MAN-MADE FIBRE ROPE SLINGS
IS 996	1979		SINGLE PHASE ELECTRIC MOTORS
ISO 3873	1977		SAFETY HELMET

SECTION-10

SPECIAL CONDITIONS OF CONTRACT

10.0 Drawings and Documents

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

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

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

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

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

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

10.7
In case of discrepancy between quoted item rate and corresponding amount in the Rate Schedule, the **quoted item rates shall be reckoned as correct and amount recalculated**. Quoted item rates shall also prevail for arriving at the total price. Evaluation of offer will be done by BHEL on Total Price of the Rate Schedule.

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 case.

SECTION-11

SPECIAL CONDITIONS OF CONTRACT

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

11.1 TIME SCHEDULE & MOBILIZATION

11.1.1 INITIAL MOBILIZATION AND TENTATIVE SCHEDULE

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

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

SL.NO.	DESCRIPTION OF MILESTONE	SCHEDULE
01	COMPLETION OF DISMANTLING OF TG SET AND AUXIALLIARIES, PACKING AND DESPATCH OF REQUIRED COMPONENTS TO WORKS FOR REPAIR.	3 WEEKS
02	BOX UP	21 WEEK
03	BARRING GEAR	22WEEK
04	SYNCHRONIZATION	24 WEEK
05	TRIAL OPERATION	28 WEEK
06	PG TEST	30 WEEK

- INDICATES THE NO. OF MONTHS FROM THE START OF CONTRACT PERIOD.

11.1.2

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

11.1.3

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

11.1.4 Start of Contract Period and Duration.

The total contract period for completion of entire work of Unit-1 shall be **30 (Thirty) weeks** from the stoppage of barring gear of turbine. The date of stoppage of barring gear of turbine shall be reckoned as the start of contract period. However the contractor shall have to mobilize his resources earlier than the start of contract period for preparatory work like taking over and chipping of foundations, blue matching and grouting of packer plates etc.

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

Unit-2 shut down shall be given after one month of the completion of trial operation of Unit-1. Time schedule for unit-2 and other condition like grace period, time extension etc shall be same as of unit-1.

SHUTDOWN OF UNIT-1 IS PLANNED FROM 1ST OF APRIL HOWEVER IT WILL DEPEND ON MATERIAL SUPPLY FROM BHEL UNITS.

BASED ON EXPERIENCE OF R&M WORKS FOR EARLIER SIMILAR CAPACITY UNITS AT GEB PROJECTS,THE COMPLETION OF R&M WORKS INCLUDING CIVIL, BOILER, STG, ELECTRICAL AND CI WILL TAKE ABOUT 12 MONTHS.

UNIT-2 SHUTDOWN SHALL BE GIVEN AFTER RUNNING THE UNIT-1 AT FULL LOAD FOR A MONTH.

CONTRACTORS TO TAKE NOTE OF ABOVE AND QUOTE ACCORDINGLY

11.1.3.1 Grace Period

Grace period of **9 (Nine) weeks** beyond the contract period of 30 (Thirty) weeks is provided for this contract. However, all milestone events as per actual requirement of project schedule shall have to be achieved by the contractor without taking recourse to the Grace Period.

11.2 Progress Monitoring, Contract Extension and Over Run

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 Clause 11.2.1 above will be made considering the availability of components to be erected and other inputs / constraints over which the contractor has no control. The programme will be reviewed area-wise and the following facts will be recorded in case of shortfall at the end of every month:

11.2.2.1

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

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

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

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

11.3 Contract Extension

11.3.1
If the completion of work as detailed in these specification gets delayed beyond the end of contract period and grace period then depending on the balance work left out, BHEL at its discretion may extend the contract.

11.3.2
A joint programme shall be drawn for the work to be completed during the extended contract period. Review of the program and record of shortfall as describe vide clause 11.2.2 shall be done during the extended period. The overrun charges will be paid in proportion to the achievement of the respective month vis-à-vis the plan for the month (for assessing the performance, the agreed plan shall be reduced by shortfall attributable to the BHEL). BHEL may disallow contractor's claim for over run charges, if the monthly programme as mentioned here not made by him.

11.3.3
The part of extension attributable to the contractor, if any, in total contract extension shall be exhausted first i.e. immediately after end of grace period. This shall be followed by the extension on account of force majeure conditions, if any, and lastly on account of BHEL.

11.4 Overrun Compensation
If the contract is extended beyond the contract (including grace) period for any reason other than those attributable to the contractor or force majeure conditions, the contractor will be compensated by payment of overrun charges at the rate of **Rs. 50,000/- (Rupees fifty thousand only) per month.** Overrun compensation will be paid for the extension attributable to BHEL only. No overrun compensation will be payable for the extension on account of reasons attributable to contractor and / or force majeure conditions.

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

11.6 Interest Bearing Recoverable 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 deem to have been completed in all respect, only when all the activities are completed satisfactorily and so certified by

BHEL site in charge. The decision of BHEL in this regard shall be final and binding on the contractor.

11.8 Contract Variation

This tender covers tentative scope of work. Also tentative scope of supplies are mentioned in annexure-A for the R&M work. The supplies are indicative and planned based on RLA/CA/PET(residual life Assessment/ conditioning assessment/performance evaluation test) reports and may vary as per actual requirement after dismantling of machine. Price quoted by bidder shall remain firm considering such variation in scope of work & scope of supplies. BHEL will not make any payment on account of any variation in scope of work & scope of supplies and no payment on account of any additional work at site.

As such Lumpsum price quoted by vendor shall be inclusive of any variation in the scope of work which is required to be carried out for completion of total work though it is not specifically mentioned in this tender specification.. No extra payment will be made by BHEL on account of variation in scope of work.

11.9 Liquidated damages (L D)

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

SECTION-12
SPECIAL CONDITIONS

12.0 TERMS OF PAYMENT

12.0 TERMS OF PAYMENT

12.0.1
The contractor shall submit his monthly on account bills with all the details required by BHEL on specified date every month covering progress of work in all respects and areas from the 25th of previous calendar month to 24th of the current month.

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

12.0.3
Release of payment in each running bill will be restricted to 95% of the value of work admitted, as per the percentage break-up for the stage of work completion stipulated vide clauses hereinafter.
The 5% thus remaining shall be on account of workmanship guarantee of work executed. The same will be released after completion of the guarantee period of **12 months** from the date of completion of entire work as certified by BHEL.

However, on specific request of vendor, this amount may be released on pro rata basis for the value of work executed and accepted by BHEL, along with any RA Bill and onwards, subject to receipt and acceptance of bank guarantee of equal amount in BHEL's prescribed format. The BG shall be kept valid till completion of such guarantee period and an additional six months claim period. This is also subject to the condition that the contractor has started the work and also furnished/remitted the initial Security Deposit as per contract.

12.0.4
The payment for running bills will normally be released within around 30 days of submission of running bill with measurement sheets. Contractor shall make his own arrangement for making payment of impending labour wages and other dues in the meanwhile.

12.0.5

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

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

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

12.1 STAGES OF PROGRESSIVE PRO-RATA PAYMENTS

The progressive pro-rata payment will be released based on accepted price/item rates in following manner:

Considering 95% of the accepted price/item rates as 100% for various items/activities of work under these specifications will be released, based on certified completion by BHEL Engineer, as pro-rata progressive payment as per the stage break up given hereafter:

12.2 STAGES OF PROGRESSIVE PRO-RATA PAYMENTS

	DESCRIPTION	PAYMENT
1	DISMANTLING AND REMOVAL OF Upper & LOWER HALVES OF HP/IP/LP CASING, THREADING OUT OF GENERATOR ROTOR	10%
2	RE-GROUTING OF SEATING STEEL PLATES OF LP CASING. PLACEMENT/ LEVELLING AND ALIGNMENT OF LP CASING	5%
3	RE-GROUTING OF SEATING STEEL PLATES OF BOTH THE PEDESTALS, PLACEMENT/ALIGNMENT OF PEDESTALS & RE-DOWELLING INCLUDING FITTING OF LUBRITE PACKERS.	5%
4	RE-TUBING OF CONDENSER, REPLACEMENT OF TUBE BUNDLES FOR ALL THREE NUMBERS LP HEATERS, REPLACEMENT OF BOTH HP HEATERS	10%
5	REVISIONING / REPLACEMENT OF CIES, IV & GOVERNING VALVE COMPONENTS	5%
6	SERVICING/REVISIONING OF BFP 3 NOS., VACCUM PUMPS, OIL PUMPS, & DW PUMPS ETC	5%
7	INSTALLATION OF CEPs INCLUDING MODIFICATION OF FOUNDATION & PIPING & THEIR SUPPORTS	5%
8	REVISIONING OF TG AUXILIARIES ALL VALVES & THEIR ACTUATORS	10%
9	REPLACEMENT OF STATOR WINDINGS & REVISIONING OF GENERATOR COMPONENTS.	8%
10	BOXING-UP OF GENERATOR	10%
11	BOXING-UP OF HP/IP/LP CASING	14%
12	ROLLING AND SYNCHRONIZATION	5%

13	TRIAL RUN	5%
14	COMPLETION OF PG TEST	3%

12.2 PAYMENT FOR WORK COMPLETED

12.2.1

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

12.2.2

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

12.2.3

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

12.2.4

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

SECTION-13

SPECIAL CONDITIONS OF CONTRACT

13.1
If extra works (requiring up to 100 man-hours) for modification, rework, revamping, in brief, any work done to change the state existing to a stage desired and also fabrication, all or any, needed due to any change in or deviation from the drawings and design of equipment, operation / maintenance requirements, mismatching, transit damages and other allied works which are not very specifically indicated in the drawings, but are found essential for satisfactory completion of the work, are done, no extra charges will be paid. The tenderers are requested to take this aspect into account and the quoted rate should include all such contingencies.

13.2
However, BHEL may consider for payment as extra on man-day basis, for such of those activities detailed in clause 13.1 which require more than 100 man-hours and such payment will be regulated by the terms, conditions and stipulations contained in the clauses contained hereinafter. It may be specifically noted that the decision of BHEL as to whether such payment is due shall be final and binding on the contractor.

13.3
Extra works should be done by a separately identifiable gang, without affecting routine activities. Daily log sheets in the proforma prescribed by BHEL should be maintained and shall be signed by the contractor's representative and BHEL engineer. No claim for extra work will be considered / entertained in the absence of the said supporting documents i.e. Daily man-hour log sheets. It may, however, be noted that signing of log sheets by BHEL engineer does not mean the acceptance of such works as payable extra works.

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

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

13.6
It shall be noted that all extra works that arise on account of the contractor's fault, will have to be carried out by the contractor free of cost. Under such circumstances, any material and consumable required for this purpose will also have to be arranged by the contractor at his cost.

13.7
After eligibility of extra works is established and finally accepted by BHEL engineer / designer, payment will be released on competent authority's approval at the following rate:

Man-day rate for eligible extra works
Single average man day rate for 8 working hours, including overtime if any, other site expenses and incidentals, including supervision, consumables, tools and tackles, Plant & Machinery, Construction Equipment etc. will be **Rs.320/-** (Rupees three hundred twenty only).

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

SECTION-14
SPECIAL CONDITIONS OF CONTRACT

14.0 INSURANCE

14.1 MARINE, STORAGE CUM ERECTION (MCE) INSURANCE AND REPAIRING DAMAGES

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

14.2 REPORTING DAMAGES AND CARRYING OUT REPAIRS

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

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

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

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

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

14.2.6

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

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

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

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

14.2.10
n case the repairs/rectification/rework and fabrication of materials lost, the work has been done by more than one agency including the contractor, the payment towards extra charges will be on pro-rata basis and the decision of BHEL in this regard is final and binding on the contractor.

14.2.11
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 (TAC) tariff 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. In case a claim is treated as Non-Standard by the underwriters for reasons attributable to the Contractor and settled for a lesser value, the differential amount will be recovered from Contractor.

14.3 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.

Contractor shall obtain and operate suitable insurance policies to cover the risk pertaining to the assets/properties and personnel belonging to or deployed by him.

SECTION-15

SPECIAL CONDITION OF CONTRACT

15.0 EARNEST MONEY DEPOSIT & SECURITY DEPOSIT

15.1 EARNEST MONEY DEPOSIT:

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

One time EMD will also be Rs. 2 lacs.

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

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 remitted by the successful tenderer. The rate of security deposit will be as below:

Sn	Contract value	Security deposit amount
1	Up to Rs. 10 lakhs	10% of contract value
2	Above Rs. 10 lakhs upto Rs. 50 lakhs	1 lakh + 7.5% of the contract value exceeding rs. 10 lakhs.
3	Above Rs. 50 lakhs	Rs 4 lakhs + 5% of the contract value exceeding rs. 50 lakhs.

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

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 (either by cash/DD or BG **for maximum 50%** of total SD) before start of the work and the balance 50% may be recovered from the running bills.

VIII) EMD of the successful tenderer, excepting One Time EMD, shall be converted and adjusted against the security deposit or specific request by the contractor.

IX) The Security Deposit shall not carry any interest.

Note: acceptance of security deposit against sl. No. (iv) and (vi) above will be subject to hypothecation or endorsement on the documents in favour of BHEL. However, BHEL will not be liable or responsible in any manner for the collection of interest or renewal of the documents or in any other matter connected therewith.

15.3Security deposit shall not be refunded to the contractor except in accordance with the terms of the contract.

APPENDIX-I

TENTATIVE DETAILS OF WORK TO BE CARRIED OUT

Erection , replacement, serving, modification of the items supplied by BHEL as per appendix-II/Customer is in the scope of contractor.

TURBINE AND AUXILIARIES :

1.0. REMOVAL OF TURBINE CLADDING AND INSULATION OF TURBINE CASING, VALVES AND PIPELINES AS REQUIRED. THIS COVERS COMPLETE CLEANING OF THE INSULATION ALSO.

2.0. REMOVAL OF PEDESTAL COVERS AND OPENING OF BEARINGS NO. 1 TO 8. RECORDING OF BEARING CLEARANCES.

3.0. CHECKING OF COUPLE RUN OUT, SWING CHECK, DECOUPLING OF HP/IP /LP ROTORS INCLUDING ALIGNMENT AND CATENARY OF MACHINE. IT IS PROPOSED TO REPLACE NEW HP/IP ROTORS AT SITE IN THIS MACHINE. HENCE THE CRO AND SWING CHECK FOR OLD ROTORS MAY NOT BE REQUIRED.

4.0. DISMANTLING AND REMOVAL OF UPPER HALF COMPONENTS OF HP, IP AND LP CASING. THE HEATING OF PARTING PLANE BOLTS ARE REQUIRED FOR HP/IP CASINGS FOR WHICH ELECTRICAL HEATERS WILL BE PROVIDED BY CUSTOMER. ANY REPAIR IF REQUIRED IN THOSE HEATERS ARE TO BE ARRANGED BY THE CONTRACTOR. HOWEVER, IF ANY ADDITIONAL MATERIAL REQUIRED THEN THE SAME WILL BE ARRANGED BY BHEL.

5.0. RECORDING OF FLOW PATH CLEARANCES OF HP, IP & LP CASINGS. RECORDING / CHECKING OF LEVEL / ELEVATION OF FRONT PEDESTAL, CENTER PEDESTAL AND LP CASING.

6.0. RECORDING OF FREE RUN OUT OF HP/IP/LP ROTORS.

7.0. REMOVAL OF LOWER HALF LINERS AND DIAPHRAGMS OF HP, IP AND LP CASINGS. DRILLING / REAMING OF DOWEL PIN HOLES OF IP LINERS AT SITE.

8.0. SAND BLAST CLEANING OF VARIOUS TURBINE COMPONENTS LIKE ROTORS, DIAPHRAGMS, LINERS, TURBINE CASINGS AND PIPE LINES ETC.

9.0. FABRICATION OF TRANSPORTING FRAMES, PACKING AND DISPATCHING OF HP, IP, LP ROTORS, CENTRE PEDESTAL, IP CASING AND ANY OF THE OTHER COMPONENTS TO BHEL WORKS / OUTSIDE FOR ANY MACHINING, BALANCING AS REQUIRED. CONTRACTOR SHALL BE RESPONSIBLE FOR FABRICATION OF PACKING BOX & PACKING. STEEL SECTIONS AND PLATES FOR FABRICATION OF CRATE WILL BE PROVIDED BY BHEL FREE OF CHARGE . CONTRACTOR SHALL ARRANGE ALL OTHER MATERIALS FOR PACKING INCLUDING WOODEN SLEEPPERS, POLYTHENE COVERS ETC OF SUCH EQUIPMENTS/ COMPONENTS.

10.0. REMOVAL OF HP/IP CASINGS INLET / OUTLET, EXTRACTION & DRAIN PIPE LINES ETC. BY CUTTING/GRINDING OR BY OPENING THE FLANGE BOLTS AS REQUIRED. REMOVAL OF IP CASING LOWER HALF FOR REPAIR / REPLACEMENT OF THE CASING.

11.0. REMOVAL OF HP INNER CASING AND HP OUTER CASING LOWER HALF. CUTTING & REWELDING OF LOOP PIPES, RADIOGRAPHY / STRESS RELEAVING AS REQUIRED. REPLACEMENT/REVISIONING OF HP CASING INLET INSERT FOR ALL THE FOUR LINES.

12.0. TEMPORARY SUPPORTING OF IV VALVES OF BOTH SIDES TO FACILITATE THE LIFTING OF LP CASING LOWER HALF AND THEN RESTORATION OF IV VALVE AFTER PLACEMENT OF LP CASING.

13.0. MATCHING OF PARTING PLANE FOR IP/LP LINERS AND DIAPHRAGMS.

14.0. MATCHING OF PARTING PLANES FOR HP DIAPHRAGMS.

15.0. MATCHING OF HP CASING PARTING PLANE FOR HP INNER AND HP OUTER CASING INCLUDING ANY BUILT UP OF MATERIAL BY WELDING ON PARTING PLANE.

16.0. REVISIONING OF BEARING NO.1 TO 8 AND IF NECESSARY THE COMPLETE SET OF BEARINGS WITH BEARING HOUSING & SPHERICAL SUPPORT MAY REQUIRED TO BE REPLACED.

17.0. DP CHECK OF ANY COMPONENTS AS REQUIRED BY BHEL. ALL CONSUMABLES REQUIRED FOR THE DP TEST LIKE DYE PENENTRANT, DEVELOPER & CLEANER ARE TO BE ARRANGED BY THE CONTRACTOR.

18.0. CHECKING / RECORDING OF CENTERING READINGS OF FRONT PEDESTAL, CENTER PEDESTAL AND LP CASING WITH PIANO WIRE ARRANGEMENT DURING DISMANTLING FOR FUTURE REFERENCE.

19.0. DISMANTLING OF VARIOUS OIL PIPELINES & REMOVAL OF FRONT & CENTER PEDESTAL ALONG WITH THEIR SOLE PLATES AS REQUIRED .

20.0. REMOVAL OF LP CASING LOWER HALVES IN THREE PIECES BY DISMANTLING / CUTTING LP CONDENSER NECK JOINT AS REQUIRED. REFLOATING OF CONDENSER. LP CASING AND CONDENSER MAY HAVE A BOLTED FLANGE JOINT OR WELDED JOINT. THE LP- CONDENSER NECK JOINT TO BE MADE BY BOLTING / RE-WELDING AS REQUIRED.

21.0. DISMANTLING OF VARIOUS PIPE LINES OF LP CASING LIKE EXTRACTION AND OIL PIPE LINES ETC. BEFORE REMOVAL OF LP CASING LOWER HALVES.

22.0. CLEANING OF MAIN OIL TANK AND FILLING OF FLUSHING / ORIGINAL SUPPLIES OF OIL.TRANSPORTATION OF OIL DRUMS FROM THE STORES & BACK.

23.0. MATCHING OF LP CASING SOLE PLATE AREA WITH SURFACE PLATE AFTER REVERSING THE LP FRONT AND LP REAR CASING LOWER HALF PIECES.

24.0. REMOVAL OF LP SOLE PLATES AND MATCHING THEM WITH SURFACE PLATE. IF REQUIRED THE SOLE PLATE MAY BE MACHINED FOR ANY UNEVEN SURFACE.

25.0. CHIPPING / REMOVAL OF SEATING STEEL PLATES OF FRONT / CENTRE PEDESTAL, LP CASING SOLE PLATES. THIS COVERS CHIPPING OF COMPLETE AREA OF SECONDARY GROUND BELOW THE SEATING STEEL PLATE FOR ABOUT 100 MM THICKNESS. REVISIONING OF ALL THE SEATING STEEL PLATE INCLUDING ANY CORRECTION / MODIFICATION AND RE-GROUTING WITH NON- SHRINKAGE CEMENT AS PER REQUIRED ELEVATION ETC. REQUIRED QUANTITY OF NON-SHRINKAGE CEMENT TO BE ARRANGED BY THE CONTRACTOR.

26.0. REVISIONING OF FRONT AND CENTER PEDESTAL SLIDING SURFACES AND KEY WAYS FOR ANY ABNORMALITY. IF NECESSARY THE PEDESTAL MAY BE SENT TO BHEL WORKS FOR MACHINING. CONTRACTOR HAS TO ARRANGE THE PACKING AND DISPATCHING OF PEDESTAL AND SOLE PLATES IF REQUIRED.

27.0. MATCHING OF FRONT PEDESTAL AND CENTER PEDESTAL PACKERS WITH SEATING STEEL PLATES AFTER GROUTING OF SEATING STEEL PLATES. NEW SOLID OVERSIZE PACKERS WILL BE SUPPLIED BY BHEL FOR BOTH THE PEDESTALS. NECESSARY MACHINING AND MATCHING OF PACKERS ARE TO BE CARRIED OUT. REQUIRED ELEVATION / LEVEL OF THE

PEDESTAL ARE TO BE ACHIEVED WITH THE HELP OF THESE PACKERS BY ENSURING THE PROPER COLOUR CONTACT ON BOTH SIDE OF THE PACKERS WITH THE SEATING STEEL PLATE AND SOLE PLATE OF THE PEDESTAL.

28.0. INSTALLATION OF LUBRITE PACKERS AT FRONT & CENTER PEDESTAL WHICH INCLUDES MATCHING, DRILLING, DOWELLING OF SOLE PLATES AND SLIDE BAR ETC.

29.0. REPLACEMENT OF LP CASING ADJUSTABLE PACKERS WITH THE NEW SOLID PACKERS AS REQUIRED AND COLOUR MATCHING OF PACKERS WITH THE SEATING STEEL PLATE AND LP SOLE PLATE. THE REQUIRED ELEVATION OF THE CASING IS TO BE ACHIEVED BY ADJUSTING THE HEIGHT OF THESE PACKERS AND NO ADDITIONAL SHIMS ARE TO BE USED IN THESE PACKERS. DURING THE COLOUR MATCHING THE LP CASING FRONT / REAR PIECES ARE LIFTED ALONG WITH SOLE PLATES ON CRANE AND COLOUR MATCHING ARE CARRIED OUT ON THESE PACKERS TO SUIT THE REQUIRED LEVEL / ELEVATION OF THE CASING.

30.0. REVISIONING OF MOP, INSPECTION OF INTERNALS, REPLACEMENT & DP CHECK OF COMPONENTS ETC. THIS COVERS ALIGNMENT OF MOP AND ITS DOWELING ETC.

31.0. RE-DOWELLING OF FRONT AND CENTER PEDESTAL SOLE PLATE WITH SEATING STEEL PLATE AFTER COMPLETION OF PEDESTALS ALIGNMENT. FOUR NOS. DOWEL PINS ARE TO BE PROVIDED IN EACH PEDESTAL IN PLACE OF PRESENT ARRANGEMENT OF TWO NUMBERS DOWEL PINS. NECESSARY DRILLING / REAMING IS TO BE DONE AT SITE.

32.0. CENTERING OF HP/IP DIAPHRAGMS, CARRIER RINGS ETC. IN IP CASING WITH THE HELP OF PIANO WIRE OR DUMMY SHAFT IN BOTH HALVES OF CASING. CHECKING/CORRECTION OF THERMAL CLEARANCES OF DIAPHRAGMS.

33.0. REPLACEMENT OF IP INLET LOOP PIPES (STEAM INLET PIPE BETWEEN IV VALVES AND IP CASING) AS REQUIRED AND THEN WELDING WITH REQUIRED PIPING PULL. THIS COVERS STRESS RELIEVING AND RADIOGRAPHY OF THE WELD JOINTS.

34.0. POSITIONING OF IP CASING LOWER HALF IN POSITION AND ITS ALIGNMENT IN RADIAL AND AXIAL DIRECTION.

35.0. CONNECTION OF VARIOUS EXTRACTION AND OTHER PIPE LINES OF IP CASING. THE SPOOL PIECES AS REQUIRED ARE TO BE INSERTED IN EXTRACTION LINES OF THE CASING. THIS COVERS CUTTING, GRINDING AND WELDING OF VARIOUS PIPE LINE INCLUDING STRESS RELIEVING / RADIOGRAPHY.

36.0. ASSEMBLY OF LP FRONT, LP REAR AND CENTER PIECES TOGETHER. ALIGNMENT AND LEVELING OF LP CASING TO DESIRED ELEVATION.

37.0. RADIAL CENTERING OF LP LINERS AND DIAPHRAGMS IN BOTH HALVES OF THE CASING. ALL RADIAL PINS ARE TO BE REPLACED WITH PROPER RADIAL PINS IN DIAPHRAGM AND LINERS. EXISTING PINS ARE TO BE TAKEN OUT BY DRILLING AND PROPER HOLES ARE TO BE MADE BY DRILLING/REAMING IN LINERS AND DIAPHRAGMS AS REQUIRED .

38.0. CHECKING / CORRECTION OF THERMAL CLEARANCE OF ALL LP DIAPHRAGMS AND LINERS.

39.0. CHECK / CORRECTION OF HORN DROP VALUE OF IP CASING.

40.0. CENTERING / CORRECTION OF HP INNER AND HP OUTER CASING BY REPLACING/CORRECTING OF KEYS AND PACKERS.

41.0. CENTERING OF LOWER HALF, UPPER HALF DIAPHRAGMS AND SEAL CARRIER RINGS OF HP CASING. CHECKING / CORRECTION OF THERMAL CLEARANCES OF DIAPHRAGMS.

42.0. RE-TAPING, DRILLING/TAPING OF NEW HOLES AS REQUIRED IN VARIOUS COMPONENTS OF TURBINE AND AUXILIARIES. DRILL AND TAP SET TO BE ARRANGED BY THE CONTRACTOR.

43.0. COLOUR MATCHING OF HP FRONT PEDESTAL, CENTER PEDESTAL, LP FRONT AND LP REAR PEDESTAL PARTING PLANE.

44.0. PREPARATION OF VARIOUS KEY WAYS OF HP/IP CASING TO ACHIEVE PROPER CONTACT AND PARALLELITY OF SLOTS ETC.

45.0. PLACEMENT OF HP CASING LOWER HALF IN POSITION AND ITS PROVISIONAL ALIGNMENT.

46.0. HORN DROP CHECK / CORRECTION OF HP CASING WITHOUT CONNECTION OF ANY PIPE LINES.

47.0. PLACEMENT OF HP/IP/LP ROTORS AND THEIR ALIGNMENT INCLUDING CATENARY BY ADJUSTING BEARINGS/PEDESTAL HEIGHT. REPLACEMENT OF HP/IP ROTOR AND SHROUD CUTTING AS REQUIRED. ASSISTANCE DURING REBLADING OF HP/IP/LP ROTORS AS REQUIRED.

48.0. SWING CHECK OF ROTORS ON HP FRONT, IP REAR AND LP REAR ENDS. IF NECESSARY THE COUPLING FACES ARE TO BE CUT/SCRAPPED TO ACHIEVE SWING CHECK VALUES OF ROTORS.

49.0. REAMING/HONING OF HP/IP AND LP/IP COUPLING HOLES AND REPLACEMENT OF BOLTS. PRESENTLY ALTERNATE BOLTS ARE FITTED AS LOOSE BOLTS AND SAME ARE TO BE CONVERTED AS FITTED BOLTS, HENCE REAMING/HONING REQUIRED IN ALL THE COUPLING HOLES. BALANCING OF WEIGHTS FOR COUPLING BOLTS.

50.0. ALIGNMENT AND CENTERING OF HP/IP CASING WITH RESPECT TO ROTORS. REPLACEMENT OF THRUST BEARING BRASS RINGS AS REQUIRED.

51.0. REPLACEMENT OF HP/IP CASING PALM KEYS AND THEIR DOWELLING. NECESSARY DRILLS / REAMER ALONG WITH THE MACHINE ARE TO BE ARRANGED BY THE CONTRACTOR.

52.0. REPLACEMENT OF IP EXHAUST PACKERS AND GUIDE KEYS. RE-DOWELLING OF IP EXHAUST GUIDE KEY BLOCK AS REQUIRED.

53.0. REPLACEMENT OF HP CASING STEAM PIPE LINE BETWEEN CIES VALVE AND HP CASING, WELDING OF JOINTS, RADIOGRAPHY AND STRESS RELIEVING AS REQUIRED.

54.0. REPLACEMENT / CORRECTION OF HP INLET, HP EXHAUST, IP INLET, IP EXHAUST, LP FRONT , LP REAR CENTRALIZING KEYS AND RE-DOWELLING .

55.0. RESTORATION OF VARIOUS OIL PIPE LINES OF FRONT AND CENTER PEDESTAL. ANY PIPING PULL OBSERVED TO BE CORRECTED BY PROVIDING THE SPOOL PIECES IN THE PIPE LINES.

56.0. RESTORATION OF ALL THE PIPE LINES OF HP/IP/LP CASINGS. ANY PIPING PULL OTHER THAN RECOMMENDED ARE TO BE CORRECTED BY PROVIDING SPOOL PIECES OR REPLACEMENT OF PIPE LINES.

57.0. VARIOUS DRAIN AND SUPPLY PIPES OF THE HP/IP CASING ARE TO BE ENSURED FOR ITS FREE FLOW BY CUTTING / RE-WELDING ETC. AS REQUIRED.

58.0. REPLACEMENT OF COMPLETE SET OF THE BEARINGS. CHECK / CORRECTION OF SPHERICAL CLEARANCE OF THE BEARING NO. 1 TO 8. THIS INCLUDES CHECKING / CORRECTION OF ACTUAL MOVEMENT OF BEARING IN ITS SPHERICAL HOUSING.

59.0. INSPECTION OF GOVERNING STUB SHAFT AND GEAR TEETH ALONG WITH MOP COUPLING FOR ANY DAMAGE OR EROSION. REPLACEMENT OF STUB SHAFT OF MOP COUPLING IF

REQUIRED. DURING ALIGNMENT OF MOP THE BOTTOM FLANGE OF THE MOP MAY BE REQUIRED TO CUT BY MACHINING FOR ITS ALIGNMENT WITH THE HP ROTOR.

60.0. CHECK / CORRECTION OF HP/MOP AND GEAR BOX ALIGNMENT. REPLACEMENT OF HP/MOP COUPLING BOLT AS REQUIRED.

61.0. REVISIONING / CORRECTION OF VARIOUS ASSEMBLIES OF FRONT PEDESTALS INCLUDING REPLACEMENT OF COMPONENTS AS REQUIRED.

62.0. DISMANTLING OF BARRING GEAR, INSPECTION OF COMPONENTS, REPLACEMENT OF PARTS AS REQUIRED.

63.0. REPLACEMENT OF HP/IP CASING NOZZLE BOX. MAKING OF GROOVE FOR STOP PLATE OF IP NOZZLE BOX.

64.0. INSPECTION /REPLACEMENT OF ALL SEAL SEGMENT OF DIAPHRAGMS AND GLANDS OF HP/IP/LP CASINGS. ADJUSTING OF RADIAL AND AXIAL CLEARANCES OF ALL SEAL SEGMENT INCLUDING REPLACEMENT. MACHINING OF CARRIER RINGS OF HP/IP CASINGS TO SUIT THE AXIAL CLEARANCES OF THE SEAL SEGMENT. REPLACEMENT OF CARRIER RINGS AS REQUIRED. THE RADIAL CLEARANCES ARE TO BE CHECKED WITH THE ADHESIVE TAPE METHOD.

65.0. DISMANTLING OF EXISTING WATER SEALING SYSTEM, ERECTION & COMMISSIONING OF NEW STEAM SEALING SYSTEM IS IN THE SCOPE OF CONTRACTOR. STEAM SEALING SYSTEM VALVES,DE-SUPPER HEATER, FLASH TANK WITH DISPERSER, GLAND STEAM CONDENSER, EXHAUSTER FANS 02 NOS. E&C OF THESE ITEMS ALSO IS IN THE SCOPE OF CONTRACTOR.

66.0. ASSEMBLY OF NEW LP FRONT, LP REAR, IP FRONT, IP REAR, HP FRONT, HP REAR GLAND BOXES INCLUDING ADJUSTMENT OF AXIAL AND RADIAL CLEARANCES OF THE SEAL SEGMENTS.

67.0. INSPECTION / REPLACEMENT OF ALL SEAL SEGMENT OF PEDESTAL OIL CATCHER.

68.0. AXIAL SHIFTING OF ANY OF THE HP/IP/LP DIAPHRAGMS AND LINERS TO ACHIEVE THE DESIRED AXIAL CLEARANCE BY MACHINING AND BUILDING UP BY WELDING.

69.0. REPLACEMENT OF HP/IP/LP CASING DIAPHRAGMS AS REQUIRED.

70.0. INSTALLATION OF THE HEAT SHIELDS FOR VARIOUS PEDESTAL OIL CATCHER ETC.

71.0. FINAL TIGHTENING OF HP/IP/LP COUPLING AND ENSURING OF DESIRED COUPLE RUN OUT AND SWING CHECK OF ROTORS.

72.0. BOXING UP OF HP/IP/LP CASING AFTER ENSURING THE COMPLETE FLOW PATH CLEARANCES OF THE VARIOUS CASINGS. ROTOR SHROUD CUTTING FOR FLOW PATH CORRECTION AS REQUIRED. CHECKING OF BUMP CHECK VALUES OF HP/IP CASING BEFORE FINAL BOXED UP OF THE CASING. ASSEMBLY OF CROSS OVER PIES BETBEEN IP-LP.

73.0. CHECKING OF BEARING CLEARANCES (1 TO 8) AND BOXING UP OF BEARINGS.

74.0. PREPARATION / FABRICATION OF TEMPORARY LINES FOR OIL FLUSHING AND ARRANGEMENT FOR THERMAL SHOCK. HYDRO TEST FOR OIL LINES AS REQUIRED IS COVERED IN THIS CONTRACT.

75.0. ASSEMBLY OF EQUIPMENT AND PIPE LINES FOR STEAM BLOWING. STEAM BLOWING OF THE PIPE LINES AND VALVES AFTER PUTTING THE MACHINE ON BARRING GEAR.

76.0. SETTING OF GOVERNING CHARACTERISTICS.

77.0. OIL FLUSHING AND NORMALIZATION OF BEARINGS.

78.0. BARRING GEAR, ROLLING AND SYNCHRONIZATION OF MACHINE.

79.0. ASSISTANCE DURING IN-SITU BALANCING OF MACHINE IF REQUIRED. DUMMY SEALS ARE TO BE INSTALLED DURING THE BALANCING OF GENERATOR ROTOR AND AFTERWARD NORMAL SEALS ARE TO BE INSTALLED.

80.0. REPLACEMENT OF COMPLETE GREASING PIPELINES OF VARIOUS KEYS AND PACKERS OF THE TURBINE AS PER REQUIREMENTS.

81.0. COMPLETE PAINTING OF TURBINE, GENERATOR, CONDENSER, COOLER OIL TANK, TURBINE CLADDING, ALL PIPE LINES, ALL PUMPS, ALL VALVES,MOTORS AND OTHER AUXILIARIES ETC. THE REQUIRED QUANTITY OF PAINT AND PRIMER SHALL BE ARRANGED BY THE CONTRACTOR WITH IN THE QUOTED PRICE.

82.0. ASSISTANCE IN REMOVAL AND ASSEMBLY OF C&I INSTRUMENTS SUCH US TURBOVISORY PICKUPS, RTDS, THERMOCOUPLES & CABLES ETC.

83.0. MODIFICATION OF LP CASING OPENING FOR PROVIDING OF BALANCING WEIGHTS.

VALVES, SERVOMOTOS AND GOV.SYSTEM :

(CIES VALVES- 2 NOS., HP GOVERNOR VALVES- 2 NOS., IP INTERCEPTOR VALVES- 2 NOS. IP GOV. VALVES- 2 NOS.) :

1.0. REVISIONING OF VALVES AND STRAINERS.

2.0. LAPPING OF VALVE CONES.

3.0. MEASUREMENT OF CLEARANCE BETWEEN VALVE BUSH AND STEM INCLUDING REPLACEMENT AS REQUIRED.

4.0. MEASUREMENT OF VALVE STEM RUN OUT.

5.0. ADJUSTMENT OF CLEARANCE BETWEEN STRAINER AND STEAM CHEST.

6.0. ASSEMBLY OF STRAINER AND VALVES.

7.0. DISMANTLING OF SERVOMOTORS OF CIES VALVE, INTERCEPTOR VALVES(HP & IP) AND GOVERNING VALVES (HP & IP).

8.0. CLEANING AND INSPECTION OF COMPONENTS, REPLACEMENT OF ITEMS FOR VALVES AND SERVOMOTORS.

9.0. ASSEMBLY OF COMPONENTS FOR SERVOMOTORS.

10.0. DISMANTLING OF EMERGENCY GOVERNORS, INSPECTION, CLEANING AND ASSEMBLY.

11.0. **NEW 02NOS CIES VALVES ARE TO BE RECEIVED TO REPLACE EXISTING OLD VALVES. CONTRACTOR MAY HAVE TO CARRY OUT SITE MODIFICATION FOR E&C OF ABOVE VALVES. AGENCY FOR INSITU MACHINING OF ANY VALVES IS REQUIRED MAY HAVE TO BE ARRANGED BY THE CONTRACTOR WITH CONSULTATION OF BHEL. BHEL'S DECISION IN THIS RESPECT IN SELECTING OF AGENCY WILL BE FINAL**.

12.0. OVERHAULING AND SETTING OF COMPLETE GOVERNING SYSTEM WHICH INCLUDES CONTROL UNIT SERVOMOTORS FOR EACH VALVE, MAIN SPEED GOVERNOR, ACCELERATION GOVERNOR, SPEEDER GEAR AND CONTROL UNIT, OVER SPEED TRIPPING DEVICE, MOP, LLG, OVER SPEED LIMITING GEAR, VACUUM PAY OFF UNIT, LOW STEAM PRESSURE UNLOADER AND OTHER ASSEMBLIES OF FRONT PEDESTAL AREAS.

13.0. CHANGING OF COMPONENTS AS REQUIRED FOR ALL ABOVE ASSEMBLIES.

14.0. REPLACEMENT OF HRH STRAINER ELEMENTS.

15.0. REPLACEMENT OF LP-IP CROSS OVER PIPES.

GENERATOR AND EXCITER

1.0. CHECKING OF BEARING CLEARANCES, CRO AND SWING CHECK OF EXCITER ROTOR.

2.0. DECOUPLING OF LP/GENERATOR/EXCITER ROTORS ETC.

3.0. DISMANTLING OF EXCITER AND LIFTING IT FROM POSITION.

4.0. DISMANTLING OF GENERATOR ASSEMBLIES INCLUDING BEARINGS, SEAL BODY, SEAL LINERS, OIL CATCHERS, PIPE LINES ETC.

5.0. PREPARATION AND THREADING OUT OF GENERATOR ROTOR. CLEANING.

6.0. FABRICATION OF TRANSPORTING FRAMES, PACKING AND DISPATCHING OF GENERATOR ROTOR.

7.0. INSPECTION & TESTING OF STATOR. ASSISTANCE IN INSPECTION & TESTING.

8.0. COMPLETE REPLACEMENT OF STATOR WINDINGS, DEWEDGING / RE-WEDGING AND VARNISHING OF STATOR SHALL BE CARRIED OUT BY BHEL EXPERT WORKMEN. **CONTRACTOR HAS TO ASSIST PROVIDING REQUIRED NUMBERS OF HELPERS, ASSISTANT WINDERS FOR RE-WINDING WORKS AT SITE. NO SEPERATE PAYMENT WILL BE MADE BY BHEL FOR RE-WINDING WORK AT SITE**.

9.0. REPLACEMENT OF ALL SIX NOS. TERMINAL BUSHINGS, AND PREPARATION FOR HV TEST.

10.0. REVISIONING OF SEAL LINERS, OIL CATCHERS, BEARING NO.6, 7 AND 8 INCLUDING REPLACEMENT.

11.0. REMOVAL OF 4 NOS. HYDROGEN COOLERS, DISMANTLING OF WATER BOXES, CLEANING OF TUBES, CONDUCTING OF HYDRAULIC TEST, PAINTING OF WATER BOXES, CLEANING OF COOLER SPACE, REPLACEMENT OF COOLER IF REQUIRED, RE- ASSEMBLY OF COOLERS.

12.0. REVISIONING OF EXCITER AND VARNISHING OF EXCITER AND ROTOR.

13.0. THREADING IN OF ROTOR AND ASSEMBLY OF GENERATOR AND EXCITER.

14.0. REVISIONING / ASSEMBLY OF SEAL BODY, SEAL LINER AND BEARINGS ETC.

15.0. ALIGNMENT OF LP/ GENERATOR AND EXCITER ROTORS.

16.0. REAMING / HONING OF COUPLING BOLT HOLES AND REPLACEMENT OF BOLT AS REQUIRED. BALANCING OF COUPLING BOLTS, COUPLE RUN OUT AND SWING CHECK..

17.0. RE-DOWELLING OF GENERATOR STATOR AND EXCITER AFTER ALIGNMENT.

18.0. GENERATOR AIR TIGHTNESS TEST AND NECESSARY REPAIR /REPLACEMENT OF ALL LEAK POINTS.

19.0. REVISIONING/OVERHAULING OF COMPLETE SEAL OIL UNIT INCLUDINGREPLACEMENT OF DPR,HPR.

20.0. REVISIONING/OVERHAULING OF HYDROGEN LINES AND REVISIONING OF HYDROGEN DRYER. REPAIR/REPLACEMENT OF ALL DIAPHRAGM VALVES.

21.0. CHECKING OF DIODES / FUSE AND REPLACEMENT IF REQUIRED.

22.0. PROVIDING OF GENERATOR EARTH FAULT PROTECTION SYSTEM INCLUDING MODIFICATION ON EXCITER ROTOR.

23.0. REPLACEMENT OF HYDROGEN DRIER WITH DUPLEX DRIER.

24.0. REPLACEMENT OF SEAL OIL SYSTEM DPR, H2 PRESSURE REGULATER.

25.0. R&M OF GAS CONTROL AND SEAL OIL SYSTEM AS PER REVISED DRG. OF BHEL.

26.0. REPLACEMENT OF STEAM TURBINE PIPING SUPPORT.

27.0. APPLICATION OF THERMAL INSULATION ON TURBINE AND INTEGRAL PIPING AS REQUIRED.

AUXILIARIES AND PIPING :

COMPLETE DISMANTLING, CONDITION ASSESSMENT INCLUDING DIMENSION MEASUREMENT, NDT CHECKS ETC., OVERHAULING, REVISIONING /SERVICING, HYDRO TEST, PRE-COMMISSIONING/COMMISSIONING OF FOLLOWING EQUIPMENTS ALONGWITH CONNECTED PIPING AND REPAIR /REPLACEMENT OF COMPONENTS / EQUIPMENTS AS PER THE REQUIREMENT
THE QUANTITIES SPECIFIED ARE ONLY TENTATIVE AND MAY VARY. CONTRACTOR SHALL QUOTE FOR THE TOAL WORK AS PER SITE REQUIREMENTS. NEW STEAM SEALING SYSTEM PIPING &VALVE ETC. ERECTION IS IN THE SCOPE OF CONTRACTOR.

SL.NO	DESCRIPTION	QTY.
1.0.	REPLACEMENT OF CONDENSATE EXTRACTION PUMPS & MOTOR INCLUDING FABRICATION OF 2NOS FOUNDATION FRAMES FOR CEP, LOWERING OF FOUNDATIONS BY 300MM & MODIFICATION OF ALL CONNECTED PIPE LINES & THEIR SUPPORTS AND CONNECTED AUXILIARIES. REQUIRED QUANTITY OF NON-SHRINKAGE CONBEXRA GP-2 CEMENT TO BE ARRANGED BY THE CONTRACTOR.	2 SETS
2.0	REFURBISHMENT OF VACUUM PUMPS (NASH) AND CONNECTED AUXILIARIES	2 NOS.
3.0	REPLACE LP HEATER NO.1,2,3 AND CONNECTED AUXILIARIES.	3 NOS.
4.0	MAIN OIL COOLERS AND CONNECTED AUXILIARIES INCLUDING VALVES. REPLACEMENT OF COMPLETE TUBE BUNDLE / TUBES AS REQUIRED. REPLACEMENT OF SACRIFICIAL ANODE.	2 NOS.
5.0	SEAL OIL COOLERS AND CONNECTED AUXILIARIES. REPLACEMENT OF COMPLETE TUBE BUNDLE / TUBES OF COOLER AS REQUIRED FITTING OF NEW SACRIFICIAL ANODE.	2 SET.
6.0	WATER / WATER COOLER & CONNECTED AUXILIARIES. REPLACEMENT OF COMPLETE TUBE BUNDLE OF BOTH THE COOLERS. REPAIR, OVERHAULING AND PROVIDING NEW SACRIFICING ANODE.	2 SETS.
7.0	DEAERATOR AND CONNECTED AUXILIARIES INCLUDING ALL TYPE & ALL SIZES VALVES. REPLACEMENT/REPAIR OF ALL INTERNALS LIKE DISPERSER,DISTRIBUTION PLATE, TRAYS, GAUGE GLASS, LEVEL INDICATOR WITH ASSOCIATED PIPES, DAMAGED NOZZLES ETC.REPAIR/REPLACEMENT OF TUBE BUNDLE AND SERVICING OF VENT CONDENSER WITH NEW SAFETY RELIEF VALVE AND CONNECTED AUXILIARIES. APPLICATION OF NEW INSULATION.	1 NO.
8.0	CLEANING OF CONDENSER TUBES, WATER BOXES, AND WATER CHAMBERS CONNECTED AUXILIARIES. REPLACEMENT OF TUBES AS REQUIRED BY BHEL/GSECL AND SUPPLIED BY GSECL. APPLICATION OF COAL TAR PITCH EPOXIDE PAINT IN THE WATER BOXES. MODIFICATION OF CONDENSER NECK JOINT FROM EXISTING FLANGE CONNECTION TO WELDED NECK JOINT. RE-SETTING OF SPRINGS, FLOATING OF CONDENSER, REPLACEMENT OF R.E. JOINTS. REPAIR / RPLACEMENT OF DAMAGED SHELL INTERNALS i.e. SHELL STIFFNER AND DISPERSERS AND REPLACEMENT OF METALIC BELLOWS OF BALANCING PIPES.	AS REQUIRED
9.0	BOILER FEED PUMPS AND AUXILIARIES INCLUDING REPLACEMENT OF COMPONENTS / CARTRIDGE AS PER THE REQUIREMENT. 3 NO CARTRIDGES (INSIDE STATOR ASSY) ARE TO BE REPLACED AND	AS REQUIRED

	THE EXISTING 3 NOS ARE TO BE OVERHAULED. TWO NUMBERS NEW OIL PUMP ARE BEING SUPPLIED FOR REPLACEMENT. REPLACEMENT OF SUCTION STRAINER AND VALVES, FLEXIBLE DRY COUPLING OF MOTOR AND PUMPS, RECIRCULATION CONTROL VALVE,LUB OIL PUMP UNITS,WARM UP VALVES ETC.	
10.0	HP HEATERS (5 AND 6.) INCLUDING CONNECTED PIPING AND AUXILIARIES. REPAIR REPLACEMENT / REVISIONING/ MODIFICATION OF STAND PIPE, VALVES, FITTINGS, GAUGE GLASS LEVEL INDICATOR AND CONNECTED AUXILIARIES. BOTH HP HEATERS NO. 5 & 6 ARE BEING SUPPLIED FOR REPLACEMENT.	2 SET
11.0	REPAIR / REPLACEMENT / SERVICING OF ALL TYPE & ALL SIZES OF VALVES & ACTUATORS OF WATER AND STEAM SIDE OF HP HEATERS	SET
12.0	REPAIR / REPLACEMENT / SERVICING OF ALL TYPE & ALL SIZES OF VALVES & ACTUATORS OF WATER AND STEAM SIDE OF LP HEATERS.	SET.
13.0	REPAIR / REPLACEMENT / SERVICING OF ALL TYPE & ALL SIZES OF VALVES & ACTUATORS OF SUCTION / DISCHARGE, RE-CIRCULATION AND NON RETURN LINES OF BFPS.	SET
14.0	REPAIR / REPLACEMENT / SERVICING OF ALL TYPE & ALL SIZES OF VALVES & ACTUATORS OF SUCTION / DISCHARGE, RE-CIRCULATION AND NON RETURN LINES OF CEPS.	SET
15.0	REPAIR / REPLACEMENT / SERVICING OF DISTILLED WATER PUMP & CONNECTED AUXILIARIES	1 SET.
16.0	CONVERSION OF STEAM SEALING SYSTEM IN PLACE OF EXISTING WATER SEALING SYSTEM.DUE TO REPLACEMENT OF TURBINE GLAND SEALING SYSTEM OLD WATER SEALING SYSTEM IS TO BE DISMANTLED AND EQUIPMENT STEAM SEALING SYSTEM ARE TO BE ERECTED AND COMMISSIONED. EXHAUSTER FANS 02 NOS, GLAND STEAM CONDENSER 01 NO. FLASH TANK PIPING AND VALVES OF THE NEW SYSTEM.	1 SET.
17.0	REPAIR / REPLACEMENT / SERVICING OF AC/DC SEAL OIL PUMP & CONNECTED AUXILIARIES	1 SET.
18.0	REPAIR / REPLACEMENT / SERVICING OF OIL CENTRIFUGES & CONNECTED AUXILIARIES	1 SET.
19.0	REPAIR / REPLACEMENT / SERVICING OF OIL TURBINE ,TURBINE DRIVEN BOOSTER PUMP & CONNECTED AUXILIARIES	1 SET.
20.0	REPAIR / REPLACEMENT / SERVICING OF PUMPS AND MOTORS MOUNTED ON MAIN OIL TANK - AC FLUSHING OIL PUMP - DC FLUSHING OIL PUMP - AUXILIARY OIL PUMP - VAPOUR EXHAUSTER	 1 NO. 1 NO. 1 NO. 2 NOS
21.0	REPLACEMENT / SERVICING OF JACKING OIL PUMP & CONNECTED AUXILIARIES	1 NO.
22.0	REPAIR / REPLACEMENT / SERVICING OF CTP & CONNECTED AUXILIARIES	3 NO.
23.0	REPLACEMENT OF SS BELLOWS OF CEP, FLASH BOX, EXTRACTION LINES, CONDENSER AIR EVACUATION LINE AND OTHER AREA.	AS APPLICABLE
24.0	REPAIR / REPLACEMENT / SERVICING OF ALL TYPES & ALL SIZES OF VALVES & THEIR ACTUATORS OF TG & AUXILIARIES TOTAL SYSTEM SUCH AS EXTRACTION SYSTEM, STEAM SEAL & LEAK OFF SYSTEM, FEED WATER SYSTEM, DRAIN SYSTEM, CONDENSER AIR EVACUATION SYSTEM, HYDROGEN COOLING WATER SYSTEM AND LUBE OIL /JACKING OIL /SEAL OIL SYSTEM & HYDROGEN AIR SYSTEM.	COMPLETE SET

25.0	REPLACEMENT/REFURBISMENT TG INTEGERAL PIPING,VALVES OF DRAIN LINES. REPLACEMENT OF HANGERS AND SUPPORTS AS SUPPLIED BY BHEL. REPLACEMENT OF DRAIN AND VENT PIPES NB.50 AND BELOW LIKE HP HEATED DRIP LINE,BFP WARM UP LINE,LP VENT LINE AND DRAIN OFHP FLASH BOX. REFURBISHMENT OF HP HEATER FEED WATER ISOLATION AND BYPASS VALVE ALONG WITH THEIR INTEGRAL BY PASS VALVES. REPLACEMENT OF HPH-6 & HPH-5EXTRACTION LINE M.O. ISOLATION VALVES. REFURBISHMENT OF QC NRV IN HPH-6 & HPH-5 EXTRACTION LINE REPLACEMENT OF EXPANSION BELLOWS IN HP FLSH BOX VENT LINE,AIR EVACUATION LINE& CONDENSATE SUCTION LINE. REPLACEMENT OF ONE NO. NEW MOTORISED VALVE IN TURBINE DRAINAGE SYSTEM (MS, CRH, HRH, LOCP PIPE) APPLICATION OF THERMAL INSULATION IN FEED HEATING EQUIPMENTS AND PIPING WHEREVER ITEMS REPLACED. THERMAL INSULATION OF COMPLETE DEAERATOR. ERECTION OF FLOW NOZZLES IN CONDESATE LINE.	AS APPLICABLE
26.0	ALL THE HT/LT/MOTORS ARE TO BE DISMANTLED AND SERVICED MECHANICALLY. ANY ELECTRICAL WORK LIKE ATTENDING OF WINDING WORKS ETC. SHALL BE DONE BY A SEPARATE AGENCY. DISMANTLING AND ASSEMBLY /ALIGNMENT OF MOTORS COVERED UNDER THIS SCOPE.	AS APPLICABLE
27.0	REPLACEMENT/ ERECTION OF ROOT VALVES AS REQUIRED FOR C&I PURPOSES.	AS APPLICABLE
28.0	REFURVISHMENT/ RPLACEMENT OF CONTROL VALVES AND ACTUATOR. CEP RECICULATION CONTROL VALVE HCV-5. RELAY PRESSURE CONTROL VALVE. TG AND AUXILIARIES CONTROL VALVES TOTAL 12 NOS. HCV-1, HCV-2,HCV-3,HCV-4, HCV-6, HCV-7, HCV-8, HCV-11, DCV-9, DCV-10, DCV-12,TCV-13. GLAND STEAM SEALING CONTRPL VALVE 04 NOS.	

THE TUBES NEST OF ALL HEAT EXCHANGERS INCLUDING MAIN OIL COOLERS, WATER/WATER COOLERS, SEAL OIL COOLERS ETC. ARE TO BE CLEANED BY WATER JET CLEANING METHOD AND BY MECHANICAL BRUSHES.

FEW TUBES ARE TO BE PULLED OUT AND HANDED OVER TO RLA AGENCY FOR FURTHER TESTING FROM CONDENSER, OIL COOLERS, WATER TO WATER COOLERS ETC. THE SAME ARE TO BE REPLACED WITH NEW ONES.

TURBINE OIL COOLERS, WATER/WATER COOLERS, H2 COOLERS, MAY ALSO NEED REPLACEMENT OF THEIR TUBES. AS SUCH THE TUBE EXPANDER & DRIVER IS ALSO REQUIRED FOR THESE WORKS ARE TO BE ARRANGED BY THE CONTRACTOR.

CONDENSER :

1.0. The condenser has to be re-floated after disconnecting the major pipe lines like CW inlet / outlet and removal of lower halves of LP casing. This need cutting of LP - condenser neck joint & its re-welding afterward. Any modification of in neck joint and adjustment of condenser packers may also be required.

2.0. Sand blasting of condenser water boxes and re-painting. Only special Epoxy paint for internal painting of water box shall be supplied by BHEL and all other paints are covered in the scope of the contract.

3.0. Re - tubing of condenser including its expansion and tube cutting. New condenser tubes shall be supplied by BHEL/GSECL.

4.0. Replacement of gaskets for condenser water box.

5.0. Condenser springs are to be checked for deflection test. These are to be removed , tested and re-assembled. The deflection test will be done by BHEL.

6.0. Hydraulic test of steam space of condenser with water fill test and cooling water side with circulating water by throttling the discharge valve is to be carried out.

DRILLING / REAMING AND DOWELING OF FOLLOWING AREAS MAY BE REQUIRED AT SITE. THE CONTRACTOR HAS TO ENGAGE A SEPARATE AGENCY, WHO GOT THE EXPERTISE IN THE FIELD ON THEIR OWN COST FOR SUCH WORKS.

1.0. HP INLET, HP EXHAUST, IP INLET PALM KEY OF BOTH LEFT AND RIGHT SIDE . EACH PALM KEY HAVE GOT FIVE NOS. DOWEL PIN HOLES.

2.0. IP EXHAUST KEY BLOCK FOR LEFT AND RIGHT SIDE.
EACH KEY BLOCK CONTAINS FOUR NOS. DOWEL PIN HOLES.

3.0. DOWELING OF FRONT PEDESTAL SOLE PLATE – 4 NOS. HOLES.

4.0. DOWELING OF CENTER PEDESTAL SOLE PLATE – 4 NOS. HOLES.

5.0. DOWELING OF IP LINER NO. 1 & 2 WITH IP CASING. EACH LINER HAVE GOT FIVE RADIAL DOWEL PIN HOLES.

6.0. DOWELING OF CENTRALIZING KEYS OF HP, IP, LP CASINGS IN UPPER HALF AND LOWER HALF FOR MALE AND FEMALE KEYS.

7.0. DOWELING OF GENERATOR STATOR, EXCITER, END SHIELD & SEAL BODY ETC

8.0. DOWELING OF LP OUTER CASING PALM PACKERS AS PER REQUIREMENT.

9.0. DOWELING OF PARTING PLANE HOLES OF TURBINE CASING, PEDESTAL, LINER ETC.

10.0. DOWELING OF MAIN OIL PUMP.

11.0. DRILLING /REAMING OF HP ROTOR AND MOP STUB SHAFT COUPLING HOLES.

12.0. DOWELLING OF LP FRONT, LP REAR, IP FRONT, IP REAR, HP FRONT AND HP REAR GLAND BOXES.

13.0. REAMING & HONING OF HP/MOP,HP/IP,IP/LP,LP/GEN COUPLING HOLES.

PG TEST.

01 INSTALLATION OF TEMPORARY IMPULSE PIPE LINES (500 MTRS. SIZE 15 NB) AND ITS TERMINATION WITH ISOLATING VALVES, NIPPLES AND FITTINGS. ETC.

02 INSTALLATION OF FLOW NOZZLE IN CONDENSATE LINE ALONG WITH MOUNTING OF THERMO WELLS AS REQUIRED BY CUTTING & REMOVAL OF SPOOL PIPE.

03 REMOVAL OF FLOW NOZZLE AFTER THE PG TEST AND INSTALLATION OLD SPOOL PIPE.

04 LAYING OF COMPENSATING CABLES AND LEAD WIRE WITH TERMINATION AT INPUT / OUTPUT MODULE AND FIELD.

05 INSTALLATION OF INSTRUMENT LIKE PRESSURE TRANSMITTER, THERMOCOUPLES, TRD'S POWER METERS ETC.

06 DISMANTLING OF ALL INSTRUMENT AFTER COMPLETION OF PG TEST.

07 INSTALLATION OF DATA LOGGER SYSTEM FOR CONDUCTING OF PG TEST.

08 PROVIDING OF MAN POWER FOR CONDUCTING OF PG TEST.

SPECIAL CONDITIONS

01 CRANE OPERATORS FOR OPERATION OF E.O.T CRANE TO BE ARRANGED BY THE CONTRACTOR.

02 AGENCY FOR DRILLING/REAMING, REAMING/HONING OF COUPLING BOLTS ARE TO BE ARRANGED BY THE CONTRACTOR IN CONSULTATION WITH BHEL. BHEL'S DECISION IS FINAL IN SELECTING THE AGENCY.

03 THE AGENCY FOR SPRAY INSULATION WORK ALONG WITH MATERIAL TO BE ARRANGED BY THE CONTRACTOR IN CONSULTATION WITH BHEL. BHEL'S DECISION IN THIS RESPECT OF SELECTING OF AGENCY WILL BE FINAL.

04 CONTRACTOR SHOULD MAKE HIS OWN ARRANGEMENT OF PC AND PRINTER ETC. AT SITE.

05 APART OF THE NORMAL MANPOWER THE CONTRACTOR HAS TO PROVIDE EXPERIENCED ENGINEERS FOR TURBINE GENERATOR & AUXILIARY WORKS DURING ENTIRE PERIOD OF EXECUTION OF WORK AT SITE.

Above scope of work is tentative . Also Tentative scope of supplies are mentioned in annexure-A ,for the R&M work. The scope of work & supplies are indicative and planned based on RLA/CA/PET(residual life Assessment/ conditioning assessment/performance evaluation test) reports and may vary as per actual requirement after dismantling of machine. Price quoted by bidder shall remain firm and BHEL will not make any payment on account of upward/downward variation in scope of work & scope of supplies and no payment on account of additional work at site.

APPENDIX- II

SCOPE OF SUPPLIES FOR THIS TENDER SPECIFICATION(MATERIAL SHALL BE SUPPLIED BY BHEL/CUSTOMER)

Sr. No.	Equipment / Assembly/ Sub-assemblies	Scope of Works	Scope of Supplies	QUANTITY (NEW SUPPLIES)	Remark
1	STEAM CHEST	1. Servicing of existing CIES valve, Governing valve and Steam chest including replacement of spares. In-situ machining to maintain co-axiality of CIES valves is to be carried out. Contractor has to engage an specialized agency to carry out in-situ machining with the consultation of BHEL.	1.Internals of existing 2 nos. CIES valves and one no. LH governing valve and one no. RH gov. valve. 2.Replacement of sleeve & plunger of relay gear and SOP. 3.Hardware for HP LH & RH steam chest. 4.Any other item required.	As required	
		2. Servicing of RH and LH interceptor steam chest including replacement of spares.	1. Internals of RH and LH Interceptor steam chest: Stem valve body assy with lower valve seat a. Internals of 2 nos. IGV b. Internals of 2 nos. IEV	ONE SET EACH	
			2. Plunger and sleeve of relay gear and SOP unit.	ONE SET	

Sr. No.	Equipment / Assembly/ Sub-assemblies	Scope of Works	Scope of Supplies	QUANTITY (NEW SUPPLIES)	Remark
			3. Hardware for Interceptor chest and any other item as required.	ONE SET	
2	FRONT PEDESTAL	1 .Servicing of Load Limiting Gear including supply of spares.	Internals of Load Limiting Gear (Excluding motor & rotary potentiometer) Sleeve, plunger & bearings 4 Nos.	ONE SET	This covers servicing of all internals of Front Pedestal and replacement of components as required.
		2. Servicing and replacement of governors and speeder gear assy. including supply of spares.	1. Main governor modification with spares. Assy & testing.	ONE SET	
			2. Spares for over speed governor including over size coupling bolts.	ONE SET	
			3. Internals of Acceleration governor.	ONE SET	
			4. Internals of speeder gear assy.	ONE SET	
		3. Servicing, dismantling, erection, testing and commissioning of main oil pump.	Supply of required spares	ONE SET	
3	Hot re-heat strainer	Servicing of Hot reheat strainer	As required	TWO SETS	

Sr. No.	Equipment / Assembly/ Sub-assemblies	Scope of Works	Scope of Supplies	QUANTITY (NEW SUPPLIES)	Remark
4	T.G. Set Bearings	Replacement of TG Set bearings from 1 to 7 along with support ring, bearing housing spherical seating etc.	1. TG Set bearings from 1 to 7 along with support ring, bearing housing spherical seating	FULL SET	
			2. RTDs for Babbit Metal & Bearing shell	14 NOS	
5	Sliding Pedestal modification	Installation of Lubrite plates in sliding surfaces of front and centre pedestal.	1.Lubrite Plate for front pedestal.	ONE SET	
			2.Lubrite Plate for Central pedestal.	ONE SET	
			3.New seating plates for re-grouting below front and centre pedestal.	FULL SET	
6	Parting Plane Fasteners	Supply and replacement of HP, IP & LP Turbine parting plane fasteners.	1. HPT- Inner cylinders. 2. HPT – Outer cylinders 3. IP turbine 4. LP turbine	FULL SET	
7	Turbine Diaphragms	Supply, Dismantling & Erection of turbine nozzle box and diaphragms	1. HP nozzle box. (Modified)	ONE SET	
			2. IP nozzle box (Modified)	ONE SET	

Sr. No.	Equipment / Assembly/ Sub-assemblies	Scope of Works	Scope of Supplies	QUANTITY (NEW SUPPLIES)	Remark
			3. Supply of new diaphragms for HP/IP casing as required.	FULL SET	
			4. IP liners 1 & 2	FULL SET	
			5. LP diaphragms stages 1 to 3 (Both front and rear new)	FULL SET	
			6. LP liners 1 to 3 both front and rear	FULL SET	
			7. Repair/Replacement LP stage-5 diaphragm (front and rear)	NIL	
			8.LP diaphragm stage-6 (Front & rear) new	ONE SET	

Sr. No.	Equipment / Assembly/ Sub-assemblies	Scope of Works	Scope of Supplies	QUANTITY (NEW SUPPLIES)	Remark
8	Turbine gland seals	All the new seals for various diaphragms and gland will be replaced.	As per requirement	FULL SET	
9	HP-IP & LP Rotors	1. Supply, dismantling and erection of new HP & IP rotor fully bladed with steam sealing arrangement and duly balanced at rated speed for unit-1.	1. HP rotor fully bladed & duly balanced.	ONE NO.	Supply of new HP/IP rotor.
			2. IP rotor fully bladed & duly balanced.	ONE NO.	
		2. Re-blading of LP Rotors including supply of blades, stellite strips for LP stage 5 & 6, hardware and lacing wire.	Supply of blades as per requirement is under the scope of BHEL , Bhopal unit. .		Contractor has to fabricate box and dispatch the rotor to works for re-blading and balancing. If required contractor has to dismantle some of blades at site .Also the replacement of satellite strip may be required to be done at site along with replacement of semi flexible coupling . Necessary material for fabrication of box will be supplied by BHEL as free of charge.

Sr. No.	Equipment / Assembly/ Sub-assemblies	Scope of Works	Scope of Supplies	QUANTITY (NEW SUPPLIES)	Remark
10	Balancing of turbine rotors	New HP/IP rotor will be used . Only LP rotor will be balanced at BHEL work.			
11	**a.)** HP Turbine inlet pipes and sealing rings	Servicing, dismantling and erection of turbine inlet pipes with supply of sealing rings and hardware.	Sealing rings and hardware for Inlet pipes for HP casing	FULL SET	
	b) IP loop pipes with stub&hardware	Replacement of IP loop pipes with stubs	Supply of Loop pipes with stub piece and hardware	FULL SET	
12	IP Casing	Repair of IP casing at BHEL , works.	Carrier rings (inlet and exhaust), stub and reducer.	ONE SET OF CARRIER RING	Contractor has to make necessary packing arrangements to dispatch the casing to the BHEL work . Necessary packing material will be given by BHEL free of charge.
13	IP-LP crossover bellows	Supply, dismantling, erection, of IP- LP crossover bellows.	IP – LP crossover bellows	AS REQUIRED	
14	Coupling bolts	Supply and replacement of HP, IP, LP- Generator coupling bolts.	Oversize fitted bolts for HP, IP, LP- Generator coupling	FULL SET	
15	Keys of HP, IP & LP casing/pedestal	Supply and erection of centralizing keys.	Centralizing keys, axial keys and support keys..	NIL	Re-doweling of centralizing keys of the casing/pedestal at site after their assembly. Existing keys to be used after necessary repair at site.
16	Barring gear	Servicing of barring gear including supply of spares.	Pinion facing ring and damage gears and bearings etc.	As per requirement	

Sr. No.	Equipment / Assembly/ Sub-assemblies	Scope of Works	Scope of Supplies	QUANTITY (NEW SUPPLIES)	Remark
17	AOP, JOP,Booster pump , AC&DC flushing pump	Servicing of all the pumps to be done at site	Necessary spares	As per requirement	
18	LP Casing	Dismantling of LP casing and re-grouting of seating plate and provding of new solid packers.	Seating steel plate and solid packers.	As per requirement	
19	PG Test	PG test of the entire system is to be carried out .	All necessary Instruments.	As per requirement	Contractor has to make necessary tapings if required and assist for the PG test till the completion of the same.
20	Surface Condenser	1. Supply, dismantling & erection of metallic bellows for balance pipe.	Metallic Bellows for balance pipe.		

Sr. No.	Equipment / Assembly/ Sub-assemblies	Scope of Works	Scope of Supplies	QUANTITY (NEW SUPPLIES)	Remark
		2. Refloating of condenser including cutting of neck joint and all connection pipings, MPI of bottom springs and replacement of damaged springs, Rewelding of neck joints & associated pipings.	Condenser bottom springs *as* per requirement and Epoxy paint.	As per requirement	
		3. protection of inside surface of water box by applying coal tar Epoxy paint	Paint will be supplied by BHEL	As per requirement	
		4. Painting of out side surface of condenser and turbine.	Paint will be supplied by BHEL		
		5. Supply and insertion of condenser tubes Cupro- Nickle	1500 numbers new condenser tubes will be supplied.	1500 Nos	
21	R. E. Joints	Supply, dismantling, erection, testing & commissioning of rubber bellows with its clamping fasteners, bottom spring supports and top hanger support.	1. Rubber – Bellows with its clamping fasteners.	8 Nos	
			2. Bottom spring supports.	8 Nos	
			3. Top hanger supports	8 Nos	

Sr. No.	Equipment / Assembly/ Sub-assemblies	Scope of Works	Scope of Supplies	QUANTITY (NEW SUPPLIES)	Remark
22	C. E. Pump	Replacement of CE Pumps by new higher capacity CE Pumps with motors. Erection commissioning and testing.	New higher capacity CE Pumps and motors. (preferably horizontal type existing design)	As per the requirement	Foundation to be chipped & lowered approx 300 mm
23	L.P. Heater No.1, 2 & 3	Supply, dismantling, erection, testing & commissioning of LP Heater tube bundle with its bolting fasteners & gaskets, local instruments and cleaning of inside surface of water boxes. Painting of inside surface of water box.	1. Tube bundles with its bolting fasteners & gaskets for L.P. Heater No.1, 2 & 3	3 Sets	
			2. Local instruments a. Reflex type level gauge (1No.) b. Pressure gauges (2 No) c. Temp. Gauges (3 Nos.)	3 Sets	
24	Deaerator	Servicing of deaerator by repair / replacement of damaged shell internals including supply of shell internals.	Shell internals i.e. dispersers, Distribution Plate, Trays etc.	ONE SET	
25	Vent Condenser	Servicing of Vent Condenser including supply of safety relief valve. Painting of water box.	Safety relief valves.	ONE SET	

Sr. No.	Equipment / Assembly/ Sub-assemblies	Scope of Works	Scope of Supplies	QUANTITY (NEW SUPPLIES)	Remark
f	H.P. Heater No. 5 & 6	1. Supply, Dismantling, erection, testing & commissioning of stainless steel tube heaters.	Stainless steel tubed HP Heaters no. 5 & 6 alongwith local instruments and fittings.	TWO SETS	Making of new foundations is included in the scope
		2. Servicing of isolation valve in extraction and feed line of HPH- 5 & 6 along with safety valve including supply of spares.	Spares for 150 / 200 NB isolation valve in extraction to HPH- 5 & 6 and 200 NB isolation valve in feed line of HPH 5 & 6	ONE NO.	
27	Hydrogen coolers	Servicing and cleaning of hydrogen coolers and replacement of rubber items.	Rubber items 1. Rubber mounting strip. 2. Rubber seal etc.	ONE SET	1
28	Water- Water coolers	Servicing of water water coolers by cleaning and replacing plugged tubes, gasket, fasteners etc. Painting of water box and shell	1. Tubes	250 Nos	
			2. Tube Bundle with bolting fasteners and gaskets.	One Set.	
29	Seal oil coolers	Servicing of seal oil coolers by cleaning and replacing plugged tubes, gasket, fasteners etc. Painting of water box	50 nos. tubes will be supplied for replacement.	50 Nos	
			2. Tube Bundle with bolting fasteners and gaskets.	ONE SET	

Sr. No.	Equipment / Assembly/ Sub-assemblies	Scope of Works	Scope of Supplies	QUANTITY (NEW SUPPLIES)	Remark
			3. Rubber items a. Rubber "O" ring for shell. b. Rubber "O" ring for floating head joint.	TWO SETS	
30	Turbine Oil Coolers	Servicing of Turbine oil coolers by cleaning and replacing plugged tubes, gasket, fasteners etc. Painting of water box and shell	100 numbers tubes for replacement	100 Nos	
			2. Tube Bundle with bolting fasteners and gaskets.	ONE SET	1
			3. Rubber items. a. Rubber "O" ring for shell. b. Rubber "O" ring for floating head joint.	Two sets	2
31	Spindle Drain Cooler	Servicing of spindle drain cooler by cleaning and replacing plugged tubes including supply of tubes for unit - 2. Painting of water box and shell	50 numbers tubes for replacement	50 Nos	Replacement of tubes and hydraulic test.

Sr. No.	Equipment / Assembly/ Sub-assemblies	Scope of Works	Scope of Supplies	QUANTITY (NEW SUPPLIES)	Remark
32	Valves	1. Servicing of BFP Suction line valves, Control valves in condenser line, HP / LP heater drip lines & Aux. steam to Deaerator line including supply of spares.	Spares for BFP Suction line valves and Control valves in condenser line, HP / LP heater drip lines & Aux. steam to Deaerator line.	ONE SET	
		2. Supply, Dismantling, erection, testing & commissioning of valves, isolation valves and Condensate Suction isolation valve, drain valves of turbine systems and auxiliaries.	1. Condensate Suction isolation valve	TWO NOS	
			2. Drain valves in drain lines to HP / LP flash box, condenser & atmosphere.	ONE SET	
33	Piping	Supply, Dismantling, erection, testing & commissioning of Piping of turbine systems and auxiliaries.	1. Pegging steam to Deaerator (Near deaerator) line.	As per requirement	Replacement at site
			2. BFP Warm-up line from deaerator to pump.	As per requirement	Replacement at site
			3. HP Heater drip lines	As per requirement	Replacement at site
			4. HP / LP Heater vent lines	As per requirement	Replacement at site

Sr. No.	Equipment / Assembly/ Sub-assemblies	Scope of Works	Scope of Supplies	QUANTITY (NEW SUPPLIES)	Remark
			5. Drain lines to HP / LP flash box, condenser & atmosphere	As per requirement	Replacement at site
34	Expansion Bellows	Supply, Dismantling & erection of various expansion bellows.	Expansion bellows in HP / LP flash box, Vent & drain lines, Air Extr. Line & condensate suction line.	As per requirement	Replacement at site.
37.	Boiler Feed pump	Servicing of all BFP by retrofitting with new design BFP cartridge.	Full set of 3 nos. cartridges will be supplied for replacement.	3 sets	Any modification required for assembling new cartridges are to be done.

(II) GENERATOR & AUXILIARIES

Sr. No.	Description	Scope of Work		Qty Unit-1	Make	Remarks by BHEL
1	**Generator & Auxiliaries**	Generator : 1. Complete re-winding of 120MW generator stator with class F insulation with new copper coils and new 6 Nos of Gen. Bushings & Gaskets with new RTDs (24nos.) for winding temp. with recorders (24 points) at GANDHINAGAR TPS Site.	Required spares to be supplied by BHEL	1 set	BHEL	Old coils will remain with GEB. Rewinding shall be carried out at site.
		1. Existing Generator Stator core is insulated with class B core plate varnish. Hence, at the time of ELCID test of Stator Core if any hot spots are found the same to be repaired locally at GANDHINAGAR Site if at all necessary by Class B core plate varnish only wherever leakage current is >100 mA.	Required spares to be supplied by BHEL	1 set	BHEL	At the time of starting of R&M work ELCID Test of stator core will be taken and hot spots are to be attended at site only.

Sr. No.	Description	Scope of Work		Qty Unit-1	Make	Remarks by BHEL
		2. Complete re-winding of Generator rotor with class –F insulation and repairing / replacement of retaining ring	New winding with class –F insulation . Retaining ring if required.	1		
		4. Supply of Hydrogen sealing ring – 2 rings per rotor at GANDHINAGAR TPS Site	Hydrogen Sealing ring	1 set	BHEL	
		3. Supply of Fan blades with locking plates at GANDHINAGAR TPS Site	Fan Blades with locking plates	2 sets	BHEL	

APPENDIX-III

LIST OF TOOLS AND PLANTS TO BE ARRANGED BY CONTRACTOR

Guidelines for contractor:

01. Tire mounted Hydra cranes
02. Trailers
03. Feeler gauge sets, feeler strips of 0.03 to 0.10 mm size.
04. Dial indicators with magnetic bases (at least 2 dials of diameter 40 mm travel - 5 mm).
05. Micrometers (inside and outside upto 300 mm, 450mm, 600mm & 1000mm).
06. Try square.
07. Set of parallel blocks/ V blocks.
08. Vernier calipers, (150 and 300 mm), measuring steel tapes and 5 meters steel rulers.
09. Precision spirit level.
10. 2 sets of D.E. and Ring spanners (6-36mm).
11. 2 sets of Box spanners (6 to 20mm and 22-50mm).
12. Allen keys of various sizes (from 2mm. Onwards).
13. U.T. and D.P.Test Kit (with consumables)
14. Complete kit for carrying out Radiography and evaluating aids
15. Crowbars tin cutters, pliers (cutting plier, nose plier grip plier circlip-outside and inside).
16. Screwdrivers and sledge hammers – 10 lbs – 1 lbs.
17. Adjustable wrenches, pipe wrenches and heck saws.
18. Single ended spaners (36 Mm and above).
19. Flat, half round, triagular bearing scrappers-8", to 12".
20. Files flat round, half round and square, rough and smooth (sizes6", 9" and 12").
21. Bench Grinders, straight grinders GQ4 and GQ6, Angle grinders.
22. Reamers upto 30 mm. Taper reamers.
23. Drilling machine with magnetic stand upto –30 mm with drill bits.
24. Flexible grinders with grinding stones and cutters of different Shapes and sizes, Angles Grinders and Sander machine.
25. Number punch, letter punch, centre punch and hole punches etc.
26. Steel wire brushes, wire brush wheels, nylon wire brushes and Painting bushes.
27. Lifting devices eye bolts, D-shackles, slings of various sizes Guide rods etc.
28. Chain pulley blocks 10T, 5 tons, 2 tons pull/lift.
29. Copper/Brass rods dia ½" to 1 ½"X450 mm.
30. Tap and die sets 6 to 36 mm.
31. Surface plate 450 X 450 mm.
32. Torch light/hand lamps with cables, 230/24 V transformer.
33. Torque wrench and torque multiplier.
34. Wooden mallet, Nylon Mallet.

35. Hand glover-asbestos, Manila rope, asbestos cloth leather and Rubber gloves.
36. Set of needle files.
37. Air blower – electric.
38. Electric drills – ¼", ½", 5/8" etc
39. Ball pen hammer of various sizes.
40. Gas cutting and heating set with torches regulators, hoses and cylinder minimum two sets).
41. Arc welding generator/rectiformers with regulator, cables, Electrode holders and shields, TIG welding holders.
42. Huck bolting machine.
43. Tube bending machine.
44. Pneumatic – grinders.
45. Hose pipes for compressed air.
46. Bench vices.
47. Hydraulic jacks 5, 10, 25 & 50, 100 tons capacity, screw jack 5 to 10 tons.
48. Ash blasting nozzles with hose pipes and tarpaulin for covering And covering arrangement while carrying out blasting so that dust does not fly off.
49. Hydraulic pump for testing coolers.
50. Electric switchboards and flood light arrangements with fuse boxes and isolating switches, plugs and sockets.
51. In addition to above T and P contractor will be required to fabricate fixtures such as pullers etc. for removal of any other equipments related to the scope of work.
52. Pedestal fans/air coolers.
53. Wooden sleepers..
54. Magnifying glass.
55. Fibre helmet.
56. Gas cutting/welding goggles, Grinding goggles.
57. Bearing pullers.
58. Tarpaulin.
59. Generator wedging tools.
60. Small Portable air compressors
61. Any other T and P as per requirement and as per our General and special conditions of contracts.

NOTE

The above list is only indicative and not exhaustive. Arrangement for any other T and P required for completion of the job shall be the responsibility of the contractor and shall be arranged by him.

APPNEDIX-IV

LIST OF T&P TO BE MADE AVAILABLE BY BHEL

BHEL WILL NOT PROVIDEE ANY T&PS TO THE CONTRACTOR EXCEPT ANY SPECIAL T&PS AS MENTIONED IN THIS TENDER

APPNEDIX-V

ANALYSIS OF UNIT RATE QUOTED

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

SIGNATURE OF THE TENDERER

DATE:

APPENDIX –VI

FORMAT FOR MONTH-WISE MANPOWER DEPLOYMENT PLAN FOR EACH UNIT

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

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

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

SIGURE OF TENDERER

DATE:

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												

Date

Signature of Tenderer

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:

APPENDIX - IX

DETAILS OF SIMILAR WORK DONE DURING THE LAST SEVEN YEARS

SN	FULL POSTAL ADDRESS OF CLIENT & NAME OF OFFICER IN CHARGE	DESCRIP-TION OF WORK	VALUE OF CONTRACT	DATE OF AWARD OF WORK	DATE OF COMMENCEMENT OF WORK	ACTUAL COMPLETION TIME (MONTHS)	DATE OF ACTUAL COMPLETION OF WORK	REMARKS
1								
2								
3								
4								
5								

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

DATE SIGNATURE OF TENDERER WITH SEAL