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

No. PW/NGP/PUR/GNR-RM-BLR/542

FOR

COLLECTION OF MATERIALS FROM STORES/STORAGE YARD, TRANSPORTATION TO SITE OF WORK, DISMANTLING THE EXISTING COMPONENTS, ERECTION OF NEW COMPONENTS, PACKING AND LOADING OF COMPONENTS TO BE TRANSPORTED TO UNITS, UNLOADING OF REPAIRED COMPONENTS RECEIVED FROM UNITS, RENOVATION AND MODERNIZATION, TESTING, COMMISSIONING, RETURNING / DISPOSAL OF DISMANTLED MATERIALS TO BHEL/CLIENT'S YARD, AND HANDING OVER OF 2X120 MW UNIT# 1&2 BOILER AND ITS AUXILIARIES, ESP, ETC.

AT

GSECL, GANDHINAGAR, GTPS UNIT-1&2 (120MW)
DIST- GANDHINAGAR, GUJRAT

PART I - TECHNICAL BID

SPECIAL & GENERAL CONDITIONS OF CONTRACT

BOOK NO.

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

Contents

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-542".**

@: 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-542"**

: shall be informed/issued later

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-542"**

BHARAT HEAVY ELECTRICALS LIMITED

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

TENDER SPECIFICATION NO. : BHE/PW/PUR/GNR-RM-BLR/542

NAME OF THE WORK :

COLLECTION OF MATERIALS FROM STORES/STORAGE YARD, TRANSPORTATION TO SITE OF WORK, DISMANTLING THE EXISTING COMPONENTS, ERECTION OF NEW COMPONENTS, PACKING AND LOADING OF COMPONENTS TO BE TRANSPORTED TO UNITS, UNLOADING OF REPAIRED COMPONNENTS RECEIVED FROM UNITS, RENOVATION AND MODERNIZATION, TESTING, COMMISSIONING, INCLUDING SERVICING/ OVERHAULING / REPAIR / REPLACEMENT, RETURNING / DISPOSAL OF DISMANTLED MATERIALS TO BHEL/CLIENT'S YARD, AND HANDING OVER OF 2X120 MW UNIT# 1&2 BOILER AND ITS AUXILIARIES, ESP, MILLS ETC.

AT

GSECL, GANDHINAGAR, GTPS, UNIT-1&2 (120MW)
DIST- SURAT, GUJRAT

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

DGM (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.

1.0 INTRODUCTION

The GANDHINAGAR TPS is about 35Km from AHEMDABAD The site is approachable by road/rail. The nearest railway station is Gandhinagar.

LOCATION & APPROACH

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

2) Project location: GANDHINAGAR, DIST: GANDHINAGAR, GUJARATSTATE

3) Transport facilities:

A) Nearest railway: GANDHINAGARon 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)

CHECK LIST (VIDE PARA 1.3 OF SECTION-I - GENERAL CONDITIONS OF CONTRACT)			
1	Name of the Bidder with Postal Address for Correspondence		
2	Name of Contact Person with Telephone & Fax No.	Mr./Ms Tel No. Fax No.	
3	Nature of the firm	PROPRIETARY / PARTNERSHIP / LIMITED CO.	
4	Details of EMD Please Indicate whether 1) One Time EMD or, 2) Only for this Tender	DD No. …… DD Date…… Name of Bank…… Amount: Rs……	
5	Validity of Offer (BHEL's Requirement: 180 days from Last Date for tender submission)		
6	Mobilization Time (Please refer Section-11 of SCC)		
7	Whether Bidder has visited the project site and acquainted themselves with the local conditions and situations.		YES/NO
8	Whether "Certificate of No-Deviation" Furnished		YES/NO
9	Details of similar jobs executed during the last five years as in "**Appendix-X**" enclosed		YES/NO
10	Whether copies of previous Work Orders (with detailed BOQ and total order value) and Completion Certificates in support of above furnished		YES/NO
11	Details of Concurrent Jobs Furnished in "**Appendix-IX**" furnished		YES/NO
12	Headquarter Organization Chart furnished		YES/NO
13	Names & Particulars of Directors/Partners/Proprietor furnished		YES/NO
14	Proposed Site Organization Chart indicating executives and		YES/NO

CHECK LIST (VIDE PARA 1.3 OF SECTION-I - GENERAL CONDITIONS OF CONTRACT)		
	supervisors furnished	
15	Financial Viability furnished as in **Annexure-I** of **GCC**	YES/NO
16	Profit & Loss account for the preceding three financial years furnished	YES/NO
17	Copy of Latest **Solvency Certificate from Govt. Authority** or **Certification by Bidder's Banker on Overdraft & BG Limits** is Furnished (Certificate shall not be older than six months from the Last Date for offer submission)	YES/NO
18	Latest **Income Tax Clearance Certificate** or c**opy of IT Return along with copy of PAN Card** is Furnished	YES/NO
19	Monthly Manpower Deployment plan as in '**Appendix-VII**' enclosed	YES/NO
20	Deployment plan for major T&P and MMD enclosed as in '**Appendix-VIII**'	YES/NO
21	Month-wise Erection & Commissioning plan enclosed	YES/NO
22	Analysis of Unit Rate Quoted as in '**Appendix-V**' furnished	YES/NO
23	List of other tools and plants/tackles/ instruments contractor proposes to deploy for the work and special tools and instruments in his possession.	ENCLOSED / NOT ENCLOSED
24	Whether the bidder has left any job unfinished? If so, give reasons.	YES/NO
25	Whether any client has terminated the contractor's work before completion? If so, furnish reasons for the same	YES/NO
26	Whether the bidder has understood all Quality Control & Quality Assurance requirements?	YES/NO
27	Whether the bidder is aware of all safety rules/codes? Whether the list of safety equipments proposed to be employed for this work is enclosed.	YES/NO
28	Whether Power of Attorney in favour of the person making this offer enclosed?	YES/NO
29	Whether all the pages are read, understood and signed and the signed copy of tender book submitted?	YES/NO

Note: strike off 'yes' or 'no' as applicable

Date: Signature of Bidder

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

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-BLR/542** 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-BLR/542

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-BLR/542** 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 SCOPE OF WORK

4.0.1 DETAILED SCOPE

THE WORK TO BE CARRIED OUT UNDER THE SCOPE OF THESE SPECIFICATIONS IN BOILER UNIT NO.1&2 (120MW), GANDHINAGAR TPS IS BROADLY AS UNDER:

1. REMOVAL OF ASH DEPOSITS FROM INSIDE & OUTSIDE OF BOILERS INCLUDING SUPPORTING STRUCTURE, PENT-HOUSE, REAR ARCH ENCLOSURES, FURNACE BOTTOM ENCLOSURES, HOPPERS, AIR PRE-HEATERS, DUCTINGS, ELECTRO-STATIC PRECIPITATOR ETC. THE QUANTITY OF ASH REMOVED WILL NOT BE CONSIDERED AS DISMANTLED WEIGHT AND **NO** SEPARATE PAYMENT FOR ASH REMOVAL, IRRESPECTIVE OF QUANTITY OF ASH CLEANED AND REMOVED/ SHIFTED IS PAYABLE TO THE CONTRACTOR.

2. DISMANTLING OF CLADDING SHEETS, OUTER AND INNER CASING, REMOVAL OF INSULATION AND REFRACTORY, SUPPORTS AND RETAINERS ETC.

3. CLEANING AND WATER WASHING OF INSIDE AND OUTSIDE OF BOILERS AND THEIR AUXILIARIES ETC.

4. VISUAL INSPECTION OF ALL PRESSURE PARTS.

5. DISMANTLING, REPLACEMENT/ OVERHAULING/ SERVICING OFVARIOUSSYSEMS/ COMPONENTS AS PER **APPENDIX- I & IIB**

6. COLLECTION OF MATERIAL FROM BHEL'S STORES/STORAGE YARD TRANSPORTATION TO SITE OF WORK/ PRE-ASSEMBLY. THE NECESSARY TRAILOR, CRANE, ETC REQUIRED FOR THIS COLLECTION AND TRANSPORTATION IS IN THE SCOPE OF CONTRACTOR.
7. PRE-ASSEMBLY, FABRICATION AS APPLICABLE.

8. USING OF DISMANTLED ITEMS FOR NEW ERECTION AFTER REPAIRING AND SHIFTING OF THE SAME /RETURNING OF UN-REUSABLE ITEMS/ SURPLUS COMPONENTS TO AREA EARMARKED IN BHEL/ CUSTOMER STORES/ STORAGE YARD.
ERECTION, ALIGNMENT AND WELDING/BOLTING/FASTENING.

10. INSTALLATION, TESTING AND COMMISSIONING OF TWO NOS. NEW ID FANS, WITH EXISTING MOTORS AND ASSOCIATED AUXILIARIES.

8. OVERHAULING, SERVINCING, REPLACEMENT OF THE WORN OUT PARTS OF 02 NOS FD FANS AND REFURVISHMENT OF THE STRUCTURAL PARTS LIKE PLAT FORMS, GRILLS ETC.
9. PRESSURE PARTS SUPPLIED FOR REPLACEMENT HAS TO BE ERECTED AND WHEREVER NOT REPLACED, HAS TO BE OVERHAULED AND SERVICED.
10. COMPONENTS OF FUEL FIRING SYSTEM ARE TO BE REPLACED/ OVERHAULLED AND COMMISSIONED.
11. STRUCTURAL INSTALLATION LIKE PLATFORMS, DUCTS& DAMPERS ARE TO BE REPLACED/ REPAIRED WHEREVER FELT NECESSARY BY BHEL/CUTOMER ENGINEERS.
12. LINING , INSULATION AND CLADDING IS TO BE REPLACED OF COMPLETE BOILER ,DUCTING AND COMPLETE SYSTEM.
13. VALVES AS PER THE LIST ARE TO BE REPLACED / SERVICED AND RE-COMMISSIONED.
14. ALL THE SOOT BLOWERS/LRSBS ARE TO REPLACED WITH NEW ONE. AUXILIARY SYSTEMS FOR ABOVE ARE ALSO IN THE SCOPE.

15. TUBULAR AIR PREHEATER : REPLACEMENT NEW SUPPLIED ELEMENTS FOR TOP, MIDDLE, BOTTOM BLOCK. APPLICATION OF CASTABLE REFRACTORY AND CLEANING WITH WATER JET.

PIPING, HANGER AND SUPPORTS, FUEL OIL PIPING RE-ROUTING ARE TO BE ERECTED/REPLACED FOR FOLLOWING:

- BFD CONTROL STATION PIPING.
- AUX. CONTROL STATION PIPING.
- PRDS SPRAY CONTROL STATION PIPING.
- RE- ROUTING OF FO SYSTEM PIPING.
- VALVE ASSOCIATED WITH ABOVE.
- HANGER AND SUPPORTS FOR MS, HRH & CRH PIPING.
- REPLACEMENT OF DRAIN VENT AND IMPULSE PIPING INCLUDING INSULATION OF ABOBE AS REQUIRED.

16. ENGAGING A SEPARATE SPECILESED AGENCY IN CONSULTATION WITH BHEL , TO CARRY OUT CHEMICAL CLEANING OF THE BOILER ALONG WITH SUPPLY OF CHEMICALS AND EQUIPMENTS.

17. COLLECTION OF MATERIALS AND INSTALLATION OF TWO NEW FIELDS OF ESP ALONG
WITH THE REPAIRING / SERVICING OF EXISTING ESP FIELDS

12. APPLICATION OF LINING, INSULATION & REFRACTORY WITH ALL SUPPORTS AND RETAINERS, CLADDING SHEET ETC.

13 NON-DESTRUCTIVE EXAMINATION & POST WELD HEAT TREATMENT.

14. PRE-COMMISSIONING CHECKS/TESTS, TRIAL RUN/TESTING AND COMMISSIONING TRIAL OPERATION, AND HANDING OVER OF THE UNITS.

15. OVERHAULING OF ALL HT AND LT MOTORS WILL BE DONE BY SEPARATE AGENCY, HOWEVER DISMANTLING AND RE-ERECTION OF MOTORS; BASE FRAME MATCHING ALIGNMENT ETC HAS TO BE CARRIED OUT BY THE CONTRACTOR WITH OUT ANY EXTRA COST. NO SEPARATE TONNAGE PAYMENT WILL BE GIVEN FOR THESE WORKS

16. ALL NECESSARY TEMPORARY ARRANGEMENTS FOR CHEMICAL CLEANING OF LUB OIL LINES ETC AND STEAM BLOWING / AIR BLOWING OF LINES SUCH AS OIL LINES, WATER LINE ETC IN INCLUDED IN THE SCOPE

THE ENTIRE WORK HAS TO BE CARRIED OUT AS PER THE LATEST AND RELEVANT PROVISIONS OF INDIAN BOILER REGULATIONS.

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.

THE DETAILS OF RENOVATION & MODERNIZATION, OVERHAULING AND SERVICING OF EQUIPMENTS UNDER THIS CONTRACT IS GENERALLY AS PER **APPENDIX-I&IIB** THESE DETAILS ARE APPROXIMATE AND MEANT ONLY GIVE A GENERAL IDEA TO THE TENDERER ABOUT THE MAGNITUDE OF THE WORK INVOLVED, AND ACTUAL QUANTUM MAY VARY.

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 ERECTION AND COMMISSIONING OF THE PLANT 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
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.

4.0.5
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.

4.0.6
THE WORK COVERED UNDER THIS SPECIFICATION IS OF HIGHLY SOPHISTICATED NATURE, REQUIRING THE BEST QUALITY WORKMANSHIP, ENGINEERING AND CONSTRUCTION MANAGEMENT.

4.0.7
ALL NECESSARY CERTIFICATES AND LICENSES, PERMITS & CLEARANCES REQUIRED TO CARRY OUT THIS WORK ARE TO BE ARRANGED BY THE CONTRACTOR EXPEDITIOUSLY AT HIS COST.

4.0.8
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.

4.0.9
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.

4.0.10
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 SHALL BE SUBMITTED TO THE BHEL ENGINEER AS DIRECTED.

4.0.11

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.

4.0.12
MATERIALS AT SITE SHALL BE STACKED NEATLY. WHERE REQUIRED, RE-STACKING SHALL BE DONE.

4.0.13
CONTRACTOR SHALL RETURN REGULARLY THE DISMANTLED COMPONENTS/ ITEMS TO BHEL/ CUSTOMER'S STORES/ STORAGE YARD AND STACK THEM AT EARMARKED AREA IN ORDERLY MANNER OR DISPOSE THEM AS REQUIRED BY THE CUSTOMER

4.0.14 OVERHAULING WORK

THE SCOPE OF OVERHAULING SHALL INCLUDE DISMANTLING OF MAIN EQUIPMENT AND ASSOCIATED PARTS, DETAILED INSPECTION AND TESTING (LPT, UT, RADIOGRAPHY etc. AS APPLICABLE), REPAIR/ REPLACEMENT OF DAMAGED/DEFECTIVE PARTS AND REASSEMBLY, RE-START AND TRIAL RUN OF THE EQUIPMENT/SYSTEM AS PER SITE REQUIREMENT.

4.1 PREPARATION OF FOUNDATIONS AND GROUTING OF EQUIPMENTS

4.1.1
WHERE AN ALTOGETHER NEW/ADDITIONAL EQUIPMENTS/ STRUCTURES ARE TO INSTALLED, AND A NEW FOUNDATION IS ESSENTIAL THE SAME WILL BE PROVIDED BY BHEL. THE DIMENSIONAL ACCURACY, AXES, ELEVATION, LEVELS ETC., WITH REFERENCE TO BENCHMARKS OF FOUNDATIONS AND ANCHOR BOLT PITS HAVE TO BE CHECKED AND LOGGED. ADJUSTMENTS OF FOUNDATION LEVEL, DRESSING AND CHIPPING OF FOUNDATION SURFACES OF ALL EQUIPMENTS AS PER BHEL ENGINEER'S INSTRUCTIONS SHOULD BE DONE BY THE CONTRACTOR AS PART OF THE WORK. CONTRACTOR SHOULD LOG BEFORE TAKING OVER THE FOUNDATIONS. DRESSING AND CHIPPING OF FOUNDATIONS TO THE EXTENT OF ACHIEVING PROPER LEVELS IS WITHIN THE SCOPE OF WORK.
IN CASE ANY EXISTING EQUIPMENT IS TO BE REPLACED WITH A NEW ONE, LIKE BEARING PEDESTAL, DUCT SUPPORTS ETC CERTAIN AMOUNT OF REWORK ON THE EXISTING FOUNDATION LIKE BREAKING OF FOUNDATION, LEVELLING OF AREA, REMOVING OF BASE PLATES, MODIFICATION OF BASE PLATES AND REPOSITIONING OF THE SAME IN ANOTHRER PLACE, MAY BECOME NECESSARY. CONTRACTOR SHALL CARRY OUT SUCH REWORK IN THE FOUNDATION TO MATCH THE REPLACED EQUIPMENT WITHIN THE AGREED PRICES/RATES.

4.1.2
ALL MINOR FOUNDATIONS AND ANCHOR POINTS REQUIRED FOR INSTALLING ERECTION EQUIPMENTS AND WINCHES ETC. ARE IN THE SCOPE OF CONTRACTOR.

4.1.3
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.

4.1.4
BHEL WILL PROVIDE FREE OF COST ONLY THE SHIMS AND PACKER PLATES (EITHER MACHINED OR PLAIN) WHICH GO AS PERMANENT PART OF THE EQUIPMENT. CERTAIN PACKER PLATES AND SHIMS OVER AND ABOVE THE QUANTITY RECEIVED AS A PART OF SUPPLIES FROM MANUFACTURING UNITS OF BHEL, WILL HAVE TO BE CUT OUT FROM STEEL PLATES/STEEL SHEETS AT SITE TO MEET SITE REQUIREMENT. CONTRACTOR SHALL CUT AND PREPARE PACKERS AND SHIMS BY GAS CUTTING OR CHISELING, GRIND AND FILE FOR DEBURRING THE PACKERS. HOWEVER, MACHINING OF THE PACKERS WHEREVER NECESSARY, WILL BE ARRANGED BY BHEL.

4.1.5

COMPLETE GROUTING OF EQUIPMENTS, INCLUDING ANCHOR/FOUNDATION BOLTS, BENEATH BASE, BASE HOLLOWS 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.

4.1.6
THERE IS NO PROVISION FOR SEPARATE PAYMENT FOR PREPARATION OF FOUNDATION & GROUTING EQUIPMENT SPECIFIED ABOVE AND RATE QUOTED SHALL INCLUDE COST OF THE SAME.

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

A) INSTALLATION OF EQUIPMENT INVOLVES GOOD QUALITY WELDING, NDE CHECKS, POST WELD HEAT TREATMENT ETC. CONTRACTOR'S PERSONNEL ENGAGED SHOULD HAVE ADEQUATE KNOWLEDGE ON THE ABOVE WORKS.

B) THE METHOD OF WELDING (VIZ) ARC, TIG OR OTHER METHOD WILL BE INDICATED IN THE DETAILED DRAWING/DOCUMENTS. BHEL ENGINEER WILL HAVE THE OPTION OF CHANGING THE METHOD OF WELDING AS PER SITE REQUIREMENT. ALL OIL PIPE LINES ARE TO BE TIG WELDED .

C) 1) WELDING OF HIGH PRESSURE JOINTS SHALL BE DONE BY IBR CERTIFIED HIGH PRESSURE WELDERS WHO HAVE BEEN PERMITTED BY CIB OF STATE CONCERNED.

2) WELDING OF ALL ATTACHMENTS TO PRESSURE PARTS, PIPING SHALL BE DONE ONLY BY THE QUALIFIED AND APPROVED WELDERS.

D) ALL THE WELDERS (STRUCTURAL AND HIGH PRESSURE) SHALL BE TESTED AND APPROVED BY BHEL ENGINEER BEFORE THEY ARE ACTUALLY ENGAGED ON WORK THOUGH THEY MAY POSSESS THE IBR/OTHER CERTIFICATE. BHEL RESERVES THE RIGHT TO REJECT ANY WELDER WITHOUT ASSIGNING ANY REASON.

E) UNSATISFACTORY AND CONTINUOUS POOR PERFORMANCE MAY RESULT IN DISCONTINUATION OF CONCERNED WELDER.

F) 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.

G) HP 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.

H) 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 THE HEATING EQUIPMENT WITH AUTOMATIC RECORDING DEVICES ALL HEATING ELEMENTS, THERMOCOUPLES AND ATTACHMENT UNITS, GRAPH SHEETS, THERMAL CHALKS, & INSULATING MATERIALS LIKE MINERAL WOOL, ASBESTOS CLOTH, CERAMIC BEADS, ASBESTOS ROPES ETC., REQUIRED FOR ALL HEATING AND STRESS RELIEVING WORKS.

J) ALL THE RECORDED GRAPHS FOR HEAT TREATMENT WORKS SHALL BE THE PROPERTY OF BHEL AND SHALL BE HANDED OVER TO BHEL SITE INCHARGE WHEN DEMANDED.

K) 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.

L) HEAT TREATMENT MAY BE REQUIRED TO BE CARRIED OUT AT ANY TIME (DAY AND NIGHT) TO ENSURE THE CONTINUITY OF THE PROCESS. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS INCLUDING LABOUR REQUIRED FOR THE WORK AS PER DIRECTION OF BHEL.

M) UT / RADIOGRAPHY WORK OF WELDS CONNECTED WITH THIS CONTRACT SHALL BE ARRANGED BY THE CONTRACTOR INCLUDING PROVISION OF SERVICES OF TECHNICIAN AND NECESSARY EQUIPMENT AND CONSUMABLES LIKE UT INSTRUMENT. GREASE, PROBES, ISOTOPE CAMERA, X-RAY FILMS, CHEMICALS ETC., AND NECESSARY LABOUR REQUIRED SUCH AS RIGGERS, HELPERS, ETC., TO ASSIST THE TECHNICIAN FOR CARRYING OUT THE RADIOGRAPHY WORK AND MAKING OTHER ARRANGEMENTS SUCH AS PROVIDING SCAFFOLDING, APPROACHES, PLATFORM LIGHTING ARRANGEMENTS, ETC., AT THEIR COST AND THE WORK HAS TO BE ARRANGED AS PER THE INSTRUCTION OF BHEL. IT MAY PLEASE BE NOTED THAT INVARIABLY THE RADIOGRAPHY WORK WILL BE CARRIED OUT AFTER THE NORMAL WORKING HOURS AND CLOSE OF OTHER SITE ACTIVITIES ONLY.

N) 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 ERECTION DOCUMENTS. THEY MAY, HOWEVER BE INCREASED DEPENDING UPON THE PERFORMANCE OF THE INDIVIDUAL WELDER AT THE DISCRETION OF BHEL ENGINEER/BOILER INSPECTING AUTHORITY.

O) ALL X-RAY FILMS OF JOINTS SHALL BE PRESERVED PROPERLY AND BE HANDED OVER TO BHEL/IBR.

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

Q) 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.

R) 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. THE SOCKET WELDING ON HP PARTS/ HP PIPING SHALL BE DONE BY THE IBR QUALIFIED WELDERS.

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

T) 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.

U) PREPARATION & NDT/ OTHER TESTING OF ANY EXISTING COMPONENT OR WELDING AS REQUIRED BY THE BHEL/CUSTOMER IS IN THE SCOPE OF THE CONTRACTOR

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 MACHINE 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
THIS WORK INVOLVES PUTTING UP SUBSTANTIAL AMOUNT OF SCAFFOLDS AS INCIDENTAL TO WORK. THE SCAFFOLDS SHALL BE PROVIDED NOT ONLY TO CARRY OUT THE WORK OF RENOVATION/ SERVICING/ OVERHAULING BUT ALSO TO FACILITATE INSPECTION, CHECKING ETC; OF OTHER AREAS e.g. PRESSURE PARTS. SCAFFOLDING WILL BE REQUIRED IN THE HORIZONTAL PASS AND SECOND PASS AND ANY OTHER AREA AS MAY BE INSTRUCTED BY BHEL. CONTRACTOR SHOULD ARRANGE AND PROVIDE SUFFIVCIENT AMOUNT OF SCAFFOLDING MATERIALS AT HIS OWN COST. THERE IS NO SEPARATE PROVISION FOR PAYMENT FOR PROVIDING SCAFFOLDS. THEREFORE, THE CONTRACTOR'S OFFER SHALL INCLUDE SUCH CONTINGENCIES.

4.3.6
THE REPLACEMENT OF PARTS/ COMPONENTS MAY REQUIRE 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 BHEL ON FREE RETURNABLE BASIS.

4.3.7
THE EXISTING BOILERS HAVE MANY TEMPORARY SUPPORTS/ STRUCTURAL ITEMS WELDED ON IT. THESE HAVE TO BE CUT & REMOVED. THE AREA SHALL BE GROUND TO PROPER FINISH AND PAINTED WITH A COAT OF RED OXIDE. CONTRACTOR SHALL PROVIDE THE RED OXIDE FOR THE SAME.

4.3.8
HYDRAULIC TEST OF PRESSURE PARTS / BOILER SHALL BE CONDUCTED AS PART OF WORK.NECESSARY PUMP IS TO BE ARRANGED BY THE CONTRACTOR.

4.3.9
ALL LUBRICANTS, 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.

4.3.10
TRIAL RUN OF THE DRIVE IN UN-COUPLED STATE AND THEN COUPLED WITH EQUIPMENT HAS TO BE DONE AFTER NECESSARY ALIGNMENT ETC.

4.3.11
PERFORMANCE OF HYDRO TEST OF OIL COOLERS OF ROTATING MACHINES, IF ANY IS INCLUDED IN THE SCOPE OF WORK. THE NECESSARY HYDRO TESTING PUMP SHOUL BE ARRANGED BY THE CONTRACTOR

4.3.12
CERTAIN ROTATING MACHINERY AFTER, INITIAL RUNS AND COMMISSIONING OF THE EQUIPMENT, MAY HAVE TO BE HOT ALIGNED.

4.3.13
AFTER INITIAL TRIAL OF ROTATING EQUIPMENTS, CONTROL AND POWER CABLING FOR MOTORS AND OTHER EQUIPMENTS/INSTRUMENTATION MAY HAVE TO BE DISCONNECTED FOR CHECKING ALIGNMENT AND RE-SETTING/RE-ALIGNMENT/HOT ALIGNMENT. CONTRACTOR WILL HAVE TO ARRANGE LABOUR FOR DISCONNECTING CONTROL AND POWER CABLING AS PER BHEL ENGINEER'S INSTRUCTIONS AND CLEARANCE AND RECONNECT THE CONTROL AND POWER CABLING AFTER RE-ALIGNMENT.

4.3.14
EXPANSION BELLOWS ARE SUPPLIED IN LOOSE SEGMENTS AND THESE ARE TO BE ASSEMBLED AND WELDED AT SITE BEFORE ERECTION. ALL JOINTS CONNECTING DUCTS, EXPANSION PIECES AND DAMPERS SHALL BE SEAL WELDED. THESE WELDS HAVE TO BE TESTED LEAK PROOF AS PER TECHNICAL INSTRUCTION/REQUIREMENT.

4.3.15
CERTAIN STRUCTURAL ITEMS WILL BE SUPPLIED IN RUNNING LENGTHS WHICH SHALL BE CUT TO REQUIRED SUITABLE SIZES AND ADJUSTED/TRIMMED AS PART OF WORK,

4.3.16
ADDITIONAL PLATFORMS OF PERMANENT NATURE FOR APPROACHING DIFFERENT EQUIPMENTS, AS PER SITE REQUIREMENT AND CANOPY FOR EQUIPMENTS AS PER SITE/THE BHEL CLIENT'S REQUIREMENTS, WHICH MAY NOT BE INDICATED IN DRAWINGS, SHALL BE FABRICATED AND INSTALLED BY THE CONTRACTOR. THE MATERIAL REQUIRED FOR PLATFORMS/ CANOPIES WILL BE SUPPLIED BY BHEL IN RANDOM LENGTHS & SIZES.

4.3.17
CONTRACTOR HAS TO FABRICATE AND ERECT CANOPIES FOR MOTORS, ESP RAPPING MOTOR, ACTUATORS, LUB OIL MOTOR, CONTROL VALVES, ETC. MATERIAL FOR THIS WILL BE SUPPLIED IN RUNNING AND RANDOM LENGTHS/SIZES. NO SEPARATE PAYMENT FOR FABRICATION IS ENVISAGED.

4.3.18
ALL WELDED JOINTS SHOULD BE PAINTED WITH ANTICORROSIVE PAINT IMMEDIATELY AFTER COMPLETION OF RADIOGRAPHY AND STRESS RELIEVING WORKS. NECESSARY PAINTS AND OTHER CONSUMABLES FOR THE ABOVE WORK ARE IN THE SCOPE OF THE CONTRACTOR.

4.3.19
SUSPENSIONS/SUPPORTS FOR TUBES/PIPING, PRESSURE PARTS, DUCTS ETC., WILL BE SUPPLIED IN RUNNING/RANDOM LENGTHS/ SIZES WHICH SHALL BE CUT TO SUITABLE SIZES AND ADJUSTED AS REQUIRED.

4.3.20
SPRING SUSPENSION/CONSTANT LOAD HANGERS MAY HAVE TO BE PRE-ASSEMBLED FOR REQUIRED LOAD AND ERECTION CARRIED OUT AS PER INSTRUCTIONS OF BHEL. ADJUSTMENTS, REMOVAL OF TEMPORARY ARRESTS/LOCKS, CUTTING OF EXCESS THREAD LENGTH OF HANGER TIE-ROD ETC., HAVE TO BE CARRIED OUT AS AND WHEN REQUIRED. LOAD SETTING OF SPRING HANGERS AFTER FLOATING OF PIPING/DUCTING DURING COLD AND HOT CONDITION WILL HAVE TO BE DONE.

4.3.21
LAYOUT OF SMALL BORE PIPING IN BOILER SHALL BE DONE AS PER SITE REQUIREMENT. NECESSARY SKETCH FOR ROUTING THESE LINES SHOULD BE GOT APPROVED FROM BHEL BY THE CONTRACTOR. THERE IS A POSSIBILITY OF SLIGHT CHANGE IN ROUTING THE ABOVE PIPE LINES EVEN AFTER COMPLETION OF ERECTION.

4.3.22
WELDING OF NECESSARY INSTRUMENTATION TAPPING POINTS, THERMOCOUPLE PADS, ROOT VALVES, CONDENSING VESSELS, FLOW METERING & MEASUREMENT DEVICES, AND CONTROL VALVES TO BE PROVIDED ON BOILER & ITS AUXILIARIES/PIPE LINES COVERED WITHIN THE SCOPE OF THIS SPECIFICATION, WILL ALSO BE THE RESPONSIBILITY OF THE CONTRACTOR AND WILL BE DONE AS PER THE INSTRUCTIONS OF BHEL SITE ENGINEER. THE INSTALLATION OF ALL THE ABOVE ITEMS WILL BE CONTRACTOR'S RESPONSIBILITY EVEN IF THE :

i. ITEMS ARE NOT SPECIFICALLY INDICATED UNDER THE RESPECTIVE PRODUCT GROUPS AS GIVEN IN THE TECHNICAL SPECIFICATIONS.
ii ITEMS ARE SUPPLIED BY AN AGENCY OTHER THAN BHEL.

NDE, AND POST WELD HEAT TREATMENT FOR ABOVE SHALL BE DONE AS PER THE SPECIFICATIONS AS PART OF WORK.

4.3.23
CERTAIN INSTRUMENTATION LIKE PRESSURE SWITCHES, AIR SETS, FILTER REGULATORS, PRESSURE GAUGES, JUNCTION BOXES, POWER CYLINDERS, DIAL THERMOMETERS, FLOW METERS, VALVE ACTUATORS, FLOW INDICATORS ETC. ARE RECEIVED IN ASSEMBLED CONDITION A INTEGRAL PART OF EQUIPMENTS. CONTRACTOR SHALL DISMOUNT SUCH INSTRUMENTS FOR CALIBRATION AND STORAGE/RE-ERECTION.

4.3.24
FIXING AND SEAL WELDING OF THERMOWELLS & PLUGS BEFORE HYDRO TEST/ STEAM BLOWING OF EQUIPMENT OR OTHER PIPING SYSTEM IS WITHIN THE SCOPE OF WORK. CONTRACTOR SHALL ALSO REMOVE THE SEAL WELDED PLUGS BY PROCESS OF GRINDING AND FIX AND SEAL WELD THERMOWELLS AFTER HYDRO TEST/STEAM BLOWING OF LINES AS PART OF WORK.

4.3.25
ALL ELECTRICAL MOTORS HAVE TO BE TESTED FOR IR & PI VALUES PRIOR TO THE TRIAL RUN. WHERE REQUIRED, DRY OUT MAY HAVE TO BE CARRIED OUT BY USING EXTERNAL HEATING SOURCE. CONTRACTOR SHALL MAKE ALL ARRANGEMENTS IN THIS REGARD AND COMPLETE THE WORK AS INSTRUCTED.

4.4 LINING & INSULATION

APPLICATION OF REFRACTORY (CASTABLE, FIRE RESISTANT BRICK LINING etc.), WOOL INSULATION, SHEET METAL CLADDING, WELDING OF STUDS/HOOKS/SUPPORTS TO HOLD LINING, INSULATION AND REFRACTORY COVERED UNDER THIS CONTRACT, SHALL INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING :-

A) APPLICATION OF INSULATION AND REFRACTORY WORKS AND SHEET METAL COVERING AS GIVEN IN VARIOUS DRAWINGS/ SPECIFICATIONS OF BHEL, SUPPLIED TO THE CONTRACTOR.

B) APPLICATION OF BITUMASTIC PAINT ON EQUIPMENTS PRIOR TO APPLICATION OF REFRACTORY, AS SPECIFIED IN DRAWINGS OR AS DIRECTED BY BHEL ENGINEER. BITUMASTIC PAINT FOR THIS PURPOSE WILL BE PROVIDED BY CONTRACTOR.

C) WOOL INSULATION IS SUPPLIED AS BONDED AND UN-BONDED MATTRESSES IN STANDARD SIZES. THESE ARE TO BE DRESSED/CUT TO SUIT WORK BY THE CONTRACTOR.

D) REMOVABLE TYPE OF INSULATION TO BE PROVIDED FOR VALVES, EXPANSION JOINTS, ETC. AS PER THE DRAWINGS OR AS DIRECTED BY BHEL ENGINEER.

E) ALUMINIUM/GI SHEET CLADDING BY FABRICATION OF ALUMINIUM/GI SHEETS TO THE SIZES AND SHAPES SPECIFIED IN DRAWINGS, BEADING, SWAGING, BEVELING OF SHEETS, CROWNING THE SHEETS, IF NECESSARY, FIXING THE SAME TO SUPPORTS, OVER WOOL INSULATION WITH SCREWS/RETAINERS AS SPECIFIED IN BHEL DRAWINGS OR AS INSTRUCTED BY BHEL ENGINEER.

F) WELDING OF STUDS/HOOKS/SUPPORTS ON EQUIPMENT INCLUDING ON PR. PARTS AND PIPING TO SUPPORT WOOL INSULATION, AS PER THE DRAWINGS OR AS INSTRUCTED BY BHEL ENGINEERS.

G) PAINTING THE INNER SIDE OF ALUMINIUM / STEEL CLADDING, WITH ANTI-CORROSIVE PAINT AS SPECIFIED. THE REQUIRED PAINT AND THINNER & OTHER ACCESSORIES/ CONSUMABLES FOR PAINTING, CLEANING THE SURFACES ETC. SHALL BE ARRANGED BY THE CONTRACTOR.

H) THE CONTRACTOR SHALL LEAVE CERTAIN GAPS AND OPENINGS WHILE DOING THE WORK AS PER THE INSTRUCTIONS OF BHEL ENGINEER TO FACILITATE INSPECTION BY BOILER INSPECTOR OR DURING COMMISSIONING TO FIX GAUGES, FITTINGS, INSTRUMENTS. THESE GAPS WILL HAVE TO BE FINISHED AS PER DRAWINGS AT A LATER DATE BY THE CONTRACTOR AT NO EXTRA COST TO BHEL.

I) THE PROFILES OF SKIN CASING PLATES, SCALLOPED BARS ETC; WHERE REQUIRED, HAVE TO BE CORRECTED TO MATCH WITH THE CORRESPONDING TUBE(S) AS INCIDENTAL TO WORK.

J) A LOG BOOK SHALL BE MAINTAINED BY THE CONTRACTOR FOR TAKING CLEARANCE OF THE LOCATION FOR APPLICATION OF LINING, REFRACTORY AND INSULATION.

K) APPLICATION AND CURINNG OF PORABLE AND CASTABLE REFRACTORIES AS PER THE PROCEDURE GIVEN BY BHEL

L) WASTAGE ALLOWANCE FOR REFRACTORY & INSULATION

WASTAGE ALLOWANCE ON NET ISSUED QUANTITY FOR REFRACTORY & INSULATION SHALL BE AS FOLLOWS:

i)	ALL TYPES OF LINING, INSULATION AND REFRACTORY	2%
III)	IRON & OTHER METAL PARTS	2%

NET ISSUED QUANTITY IS THE GROSS QUANTITY ISSUED LESS THE USEABLE QUANTITY RETURNED TO BHEL. ACCEPTANCE OF ANY MATERIAL AS USEABLE WILL BE ABSOLUTELY AT BHEL ENGINEER'S DISCRETION.

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 BY AIR, OIL OR STEAM AS THE CASE MAY BE,

CHEMICAL CLEANING OF VARIOUS SYSTEMS & PIPING, STEAM BLOWING OF THE PIPE LINES, FLOATING OF SAFETY VALVES 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 OF SOME PORTION OF EXISTING PIPING/VALVES, PLACING OF RUBBER WEDGES/ BLANKS IN THE VALVES AND OTHER OPENINGS, INSTALLATION OF TEMPORARY TANKS FOR CHEMICAL MIXING, TEMPORARY ACCESS PLATFORMS TO MIXING TANKS ETC. WHERE REQUIRED, BENDS HAVE TO BE FABRICATED AT SITE FROM RUNNING LENGTH OF PIPE. TEMPORARY INSTALLATION ITSELF HAS TO BE TESTED, TRIED, AND SUBJECT TO NON-DESTRUCTIVE EXAMINATIONS AS PER THE INSTRUCTIONS OF BHEL 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, WELDING, AND POST-WELD-HEAT TREATMENT IF ANY, OF REQUISITE BLANKS FOR CONDUCT OF HYDRAULIC TEST IS PART 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. NO SEPARATE PAYMENT IS ENVISAGED FOR THESE ACTIVITIES.

4.5.6
DURING PRE-COMMISSIONING/ COMMISSIONING, REPLACING/CHANGING MECHANICAL/ OTHER SEALS OF EQUIPMENTS, PUMPS, REMOVAL AND CLEANING/REPLACING OF FILTERS ETC IS WITHIN THE SCOPE OF WORK.

4.5.7
IN CASE ANY DEFECT IS NOTICED DURING TESTS, TRIAL RUNS OF BOILER & ITS AUXILIARIES SUCH AS LOOSE COMPONENTS, UNDUE NOISE OR VIBRATION, STRAIN ON CONNECTED EQUIPMENT ETC., THE CONTRACTOR SHALL IMMEDIATELY ATTEND TO THESE DEFECTS AND TAKE NECESSARY CORRECTIVE MEASURES. IF ANY READJUSTMENT, REALIGNMENT, BALANCING ETC., ARE NECESSARY, THE SAME SHALL BE DONE AS PER BHEL ENGINEER'S INSTRUCTIONS.

4.5.8
CONTRACTOR SHALL CUT/OPEN WORK, IF NEEDED, AS PER BHEL ENGINEER'S INSTRUCTIONS DURING COMMISSIONING FOR INSPECTION, CHECKING AND MAKE GOOD THE WORKS AFTER INSPECTION IS OVER.

4.5.9
COMMISSIONING ACTIVITIES WILL CONTINUE TILL THE COMPLETION OF TRIAL RUN. DURING THIS PERIOD CONTRACTOR SHALL MAKE AVAILABLE THE SERVICES OF SEPARATE DEDICATED LABOR FORCE COMPRISING OF SUITABLY SKILLED AND SEMI/UN-SKILLED HANDS ALONGWITH NECESSARY TOOLS AND PLANTS, CONSUMABLES ETC.

4.5.10
IT SHALL BE SPECIFICALLY NOTED THAT THE CONTRACTOR MAY HAVE TO WORK ROUND THE CLOCK. THE CONTRACTOR'S OFFER SHALL BE INCLUSIVE OF THESE FACTORS.

4.5.11
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, CONSUMABLES ETC., REQUIRED FOR THIS SCOPE OF WORK SHALL BE PROVIDED BY THE CONTRACTOR. 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.

4.6.1.1

SPECIAL MAN POWER: IN ADDITION TO PROVIDING REGULAR MANPOWER, CONTRACTOR IS REQUIRED TO PROVIDE EXPERTS WHO HAVE WORKING EXPERIENCE OF MORE THAN 5 TO 10 YEARS IN THE RESPECTIVE AREA AS PER FOLLOWING TABLE:

S. NO.	AREA OF SERVICE
1	WELDING & PRESSURE PARTS
2	ROTATING MACHINES
3	ESP
4	ASSISTANCE FOR COMMISSIONING

VENDOR SHOULD DEPLOY ADEQUATE AND EXPERIENCED MANPOWER IN ABOVE WORK AREAS AS PER OUR REQUIREMENT. THE ABOVE ENGINEERS/SUPERVISORS ARE REQUIRED IMMEDIATELY AFTER MOBILIZATION OF SITE. IN CASE OF FAILURE OF DEPLOYMENT OF ABOVE ENGINEER/SUPERVISORS, A DEDUCTION OF **RS.1200/- PER DAY** FOR SHORTAGE OF PER EXPERT SUPERVISOR SHALL BE MADE BY BHEL. BHEL SHALL EXERCISE ITS DISCRETION IN ASCERTAINING THE SUITABILITY OF EXPERT SUPERVISION, REQUIREMENT AT PROJECT SITE AND ALSO IN PERMITTING THE ABSENCE OF SUCH SUPERVISION DUE TO ANY REASONS

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.

4.7

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 TRANSPORTATION 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.

ALL ARRANGEMENTS, INCLUDING PROVIDING & LAYING OF SLEEPER BEDS, BACKFILLING OF APPROACHES WHEREVER NECESSARY FOR SAFE MOVEMENT OF THE CRANES AS DIRECTED BY BHEL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. SLEEPERS FOR THIS PURPOSE SHALL BE PROVIDED BY THE CONTRACTOR.

5.2.15
ANY BOOM REDUCTION, EXTENSION FOR THE USE OF CRANES AND RESTORATION TO PREVIOUS STATE IS TO BE DONE BY THE CONTRACTOR AS PER THE REQUIREMENT OF JOB AND AS DIRECTED BY BHEL .

5.2.16
IN CASE OF RAIN WATER ACCUMULATION / WATER LOGGING DURING RAINY SEASON , CONTRACTOR HAS TO ARRANGE SUFFICIENT NUMBER OF D-WATERING PUMPS WITH FUEL TO CLEAR THE WATER FOR CARRYING OUT THE WORK. ALSO CONTRACTOR SHOULD ASSIT BHEL IN CLEARING THE ROADS FOR MATERIAL MOVEMENT.

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.

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 not provide paint & primer it is 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 on Chargeable basis as per the prevailing rate of M/s GESCL. 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

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

5.9.1

The contractor shall pay all (save the specific exclusions as enumerated in this contract) taxes, fees, license charges, deposits, duties, tools, royalty, commissions or other charges which may be levied on the input goods & services consumed and output goods & services delivered in course of his operations in executing the contract. In case BHEL is forced to pay any of such taxes, BHEL shall have the right to recover the same from his bills or otherwise as deemed fit.

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

5.9.2 Service Tax & Cess on Service Tax

Service Tax and Cess on Service Tax as applicable on output Services are excluded from contractor's scope; therefore contractor's price/rates shall be **exclusive** of Service Tax and Cess on Output Services. In case, it becomes mandatory for the contractor under provisions of relevant act/law to collect the Service Tax & Cess from

BHEL and deposit the same with the concerned tax authorities, such applicable amount will be paid by BHEL. Contractor shall submit to BHEL documentary evidence of Service Tax registration and remittance record of such tax immediately after depositing the tax with concerned authorities. Contractor shall obtain prior written consent from BHEL before billing the amount towards such taxes.

With introduction of Cenvat Credit Rules 2004, which came into force w.e.f. 10.09.2004, Excise Duty paid on Input Goods including Capital Goods and Service Tax paid on Input Services that are used for providing the output services can be taken credit of against the Service Tax payable on output services. However BHEL may opt for availing the abatement provision in which case cenvat credit may not be available on input duty.

5.9.3 VAT (Sales Tax /WCT)

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

5.9.4 Modalities of Tax Incidence on BHEL

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

5.9.5 New Taxes/Levies

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

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

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

5.10 UBMISSION OF PERIODICAL REPORTS

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

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

BHEL at site will suggest formats for these reports.

5.11

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

SECTION-6

SPECIAL CONDITIONS OF CONTRACT

6.0 CONTRACTOR'S OBLIGATION IN REGARD TO EMPLOYMENT OF SUPERVISORY 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.
- 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&P 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 and commissioning which shall be supplied under DU by units or Customer shall be handed over to contractor for which reconciliation shall be done at the end. All chemicals for chemical cleaning is in bidder scope.

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 authorized 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.

8.13 STATUTORY INSPECTION.

8.13.1

The scope includes getting the approvals from the statutory authorities (like Boiler Inspector, Factory Inspector, Electrical Inspector, P.F. Commissioner, Labour Commissioner and any other Authority connected to this project work). This includes arranging for inspection visits of 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 energized by electric power with supply voltage of more than 24 volts. For work in confined spaces, lighting shall be arranged with power source of not more than 24 volts.

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

9.2.1.8
Where it becomes necessary to provide and/or store petroleum products, explosives, chemicals and liquid or gaseous fuel or any other substance that may cause fire or explosion, the contractor shall be responsible for carrying out such provisions and/or storage in accordance with the rules and regulations laid down by the relevant government acts, such as petroleum act, explosives act, petroleum and carbides of calcium manual of the chief controller of explosives, Government of India etc. The contractor in all such matters shall also take prior approval of the 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 **<u>Emergency Response</u>**

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

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

9.6.2
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**:

SNo.	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 11833	1986		DRY POWDER FIRE EXTINGUISHERS FOR

IS No	YEAR	Amd upto	DESCRIPTION
			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. In case of forced shutdown of unit, BHEL will ask contractor to mobilize the site within one week of intimation of shutdown.

11.1.3

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

11.1.4 Start of Contract Period and Duration.

The total contract period for completion of entire work shall be **30 (Thirty) weeks** from the date of shutdown of unit. The date of start of work at site shall be reckoned as the date of shutdown of unit. 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.

Unit-1 work has to be completed in 30 weeks from the date of start of work and time schedule for completion of unit-2 is also for 30 weeks. Unit-2 shut down shall be given based on completion of unit-1 work and synchronization. Work of unit-2 has to start after one month there after.

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

In case of forced shutdown, BHEL will intimate for shutdown of unit and contractor has to mobilize the site within seven days from the date of intimation. In such case date of start of work shall be one week from the date of intimation of forced shutdown.

11.1.3.1 Grace Period

Grace period of **12 (Twelve) 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

11.8.1 VARIATION IN WORK QUANTITIES

EVENTHOUGH THE PRICE TO BE QUOTED BY BIDDER IS LUMPSUM FOR THE DETAILED LIST OF ITEMS OF WORK/ACTIVITY FURNISHED IN THIS TENDER SPECIFICATION, THESE QUANTITIES ARE LIKELY TO VARY. IN CASE THE QUANTITY OF ANY ITEM ACTUALLY EXECUTED IS INCREASED/REDUCED WITH RESPECT TO CORRESPONDING QUANTITITY INDICATED IN THIS TENDER SPECIFICATION, THE STANDARD RATES AS PER THE ANNEXURE-IIC SHALL BE OPERATED IN BOTH THE CASES FOR ADDITIONAL PAYMENT /RECOVERY.

11.8.2 VARIATION IN H.P. BUTT WELD JOINTS

THE QUANTITY OF HP BUTT WELD JOINTS IN PRESSURE PARTS AND IBR PIPING INDICATED ARE TERMINAL JOINTS OF RESPECTIVE PRESSURE PART/IBR PIPING AND IS RELATED TO THE WORK OF DISMANTLING AND REPLACEMENT OF PRESSURE PARTS & PIPING. THESE ARE ONLY ESTIMATED QUANTITIES AND MAY VARY (ON EITHER SIDE) DEPENDING UPON SITE CONDITION. THE VARIATION IN HP JOINTS QUANTITY IN DISMANTLING AND REPLACEMENT OF PRESSURE PARTS AND PIPING WILL BE TREATED AS UNDER:-

5.4.2.1
THE OVERALL NUMBER OF HP BUTT WELD JOINTS (INCLUDING ALL SYSTEMS OF PRESSURE PARTS AND IBR PIPING INVOLVING HP JOINTS TOGETHER) INDICATED VIDE VARIOUS APPENDICES MAY VARY. PHYSICAL QUANTITIES OF TENDERED AND ACTUALLY EXECUTED HP JOINTS SHALL BE CONVERTED TO EQUATED NUMBER OF JOINTS IN TERMS OF STANDARD JOINT SIZE OF DIA 63.5X6.3 mm THICKNESS AS PER THE METHOD AND TABULATION PROVIDED VIDE APPENDIX-4 VARIATION IN H.P. JOINTS SHALL BE WORKED OUT

AFTER ACTUAL EXECUTION OF WORK AS PER ONE OF THE APPLICABLE CASES DEFINED HEREUNDER.

CASE N0.1: WITH NO VARIATION IN TONNAGE OF PRESSURE PART & IBR PIPING: –

IN THIS CASE THE EQUATED QUANTITY OF ACTUALLY EXECUTED H.P. JOINTS SHALL BE COMPARED WITH THE EQUATED QUANTITY OF TENDERED HP JOINTS OVER WHICH VARIATION LIMITS AS ABOVE HAS BEEN APPLIED.

NOTE: VARIATION UPTO & INCLUDING +/- 2% OF TOTAL TENDERED WEIGHT OF PRESSURE PARTS & IBR PIPING WILL BE CONSIDERED AS CASE OF NO VARIATION IN TONNAGE FOR THE PURPOSE OF CALCULATING HP JOINTS VARIATION.

CASE NO.2: WITH VARIATION IN TONNAGE OF PRESSURE PART & IBR PIPING:-

IN CASE THERE IS A VARIATION IN H.P. JOINTS AND ALSO VARIATION IN WEIGHT OF PRESSURE PARTS AND IBR PIPING, FOLLOWING PROCEDURE WILL BE ADOPTED:-

THE EQUATED QUANTITY OF TENDERED H.P. JOINTS WILL BE CALCULATED AS IN THE CASE NO. 1 ABOVE, WHICH SHALL THEN BE ADJUSTED IN PROPORTION TO THE ACTUALLY EXECUTED TONNAGE IN PRESSURE PART & IBR PIPING WITH REFERENCE TO CONTRACTUAL TONNAGE OF PRESSURE PART & IBR PIPING. AFTER ARRIVING AT THE ADJUSTED NUMBER OF H.P. EQUIVALENT JOINTS BY ABOVE CALCULATION, VARIATION LIMITS AS PRESCRIBED ABOVE SHALL BE APPLIED ON THIS AND THEN THE EQUATED QUANTITY OF ACTUALLY EXECUTED HP JOINTS SHALL BE COMPARED.

IN BOTH THE CASES AS STATED ABOVE, COMPENSATION/RECOVERY WILL BE APPLICABLE ON THE VARIATIONS UP TO THE LIMITS OF (+/-) 2%. FOR THE VARIATIONS BEYOND PLUS 2% .

ALL-INCLUSIVE AVERAGE RATE FOR PAYMENT/RECOVERY OF HP JOINTS BEYOND VARIATION LIMITS (FOR ALL TYPES OF MATERIAL) WILL **BE Rs. 350/-** (RUPEES THREE HUNDRED FIFTY ONLY) PER EQUIVALENT JOINTS OF STANDARD SIZE OF DIA. 63.5 MM X 6.3 MM.

5.4.2.2
IT IS IMPORTANT TO NOTE THAT WHILE CALCULATING THE TOTAL NUMBER OF ACTUALLY EXECUTED HP JOINTS, ONLY THE PERMANENT HP JOINTS SHALL BE TAKEN INTO ACCOUNT. NO OTHER WELD JOINTS, LIKE ANY SOCKET / FILLET JOINTS, BUTT JOINTS OF DRAINS AND VENTS ON PERMANENT AND TEMPORARY PIPING SYSTEMS AND ALL BUTT JOINTS OF TEMPORARY PIPING SYSTEMS ETC,

5.4.2.3
HP JOINTS INVOLVED IN THE IMPULSE PIPING TAKING OFF FROM THE ROOT VALVES UP TO THE INSTRUMENT WILL NOT BE CONSIDERED ON EITHER SIDE FOR CALCULATION OF VARIATION IN HP JOINTS.

5.4.2.4
STANDARD OUTPUT LIST FOR HP WELD JOINTS OF VARIOUS SIZES IS PROVIDE VIDE APPENDIX-V FOR THE PURPOSE OF CALCULATION OF EQUATED (EQUIVALENT) HP JOINTS. WELD SIZES NOT FALLING IN THE GIVEN CATEGORIES CAN BE EXTRAPOLATED TO THE NEAREST SIZE.

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

12.0.1
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:

THE PERCENTAGES OF PAYMENT TERMS SHOWN HERE IS ONLY FOR THE CONVENIENCE OF PAYMENT AND SHOULD NOT BE USED FOR ASSESMENT OF SCOPE OF WORK.

THE PAYMENT WILL BE MADE TO THE CONTRACTOR SUBJECT TO THE PRESENTATION OF BILLS ALONG WITH THE SIGNED PROTOCOLS / WORK COMPLETION CERTIFICATES FROM THE RESPECTIVE AREAS OF GSECL AND BHEL AUTHORITIES.

IN CASE OF ANY ERROR / DEVIATION OBSERVED IN THE FOLLOWING PAYMENT PERCENTAGES, DECISION OF BHEL EXECUTIVE AT SITE WILL BE CONSIDERED AS FINAL.

12.1.1 STAGES OF PROGRESSIVE PRO-RATA PAYMENTS

Sl.No	Area	Billing Schedule as per contract %			
		A	B	C	A+B+C
		Dismtl	Erecn	Commg	Total%
1	Pressure Parts	5	10		15
2	Fuel firing	5	5		10
3	Structure materials , Duct & dampers	2	2		4
4	Linning and Insulation	2	3		5
5	Valves & soot blowers	2	2	1	5
6	Fans	2	5	1	8
7	Tubular air pre-heater	2	3	1	6
8	Piping and Hangers & supports, fuel oil piping rerouting	2	2	1	5
9	Electrical controls and instrumentation	2	5	1	8
10	Miscellaneous items like burner till shear pin, air filter, thermocouple etc	1	1	0	2
11	ESP	5	8	2	15
12	Completion Hydro Test of Boiler			2	2
13	Boiler light up			1	1

14	Chemical cleaning			5	5
15	Steam blowing of boiler			2	2
16	On First synchronisation of Unit			1	1
17	On completion of PG test			1	1
18	After completion of Defect liability period			5	5
TOTAL %		**30**	**46**	**24**	**100.0**

MEASUREMENT OF THE WORK COMPLETED

BHEL ENGINEER'S DECISION REGARDING STAGE OF PAYMENT CORRESPONDING TO PROGRESS OF WORK, CALCULATION OF WEIGHT ETC. WILL BE FINAL AND BINDING ON THE CONTRACTOR..

ABOVE % IS NOTIONAL AND SHALL BE SUB-BIFURCATED AT THE TIME OF EXECUTION AND SHALL BE DONE BY BHEL CONSTRUCTION MANAGER

..

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

13.0 EXTRA CHARGES FOR RECTIFICATION AND MODIFICATION

13.1
IF EXTRA WORKS (REQUIRING LESS THAN **100 MAN-HOURS**) FOR MODIFICATION, REWORK, REVAMPING, IN BRIEF, ANY WORK DONE TO CHANGE THE STATE EXISTING TO A STAGE DESIRED AND ALSO FABRICATION, ALL OR ANY, ARE NEEDED DUE TO ANY CHANGE IN OR DEVIATION FROM THE DRAWINGS AND DESIGN OF EQUIPMENT, OPERATION/ MAINTENANCE REQUIREMENTS, MISMATCHING, TRANSIT DAMAGES AND OTHER ALLIED WORKS WHICH ARE NOT VERY SPECIFICALLY INDICATED IN THE DRAWINGS, BUT ARE FOUND ESSENTIAL FOR SATISFACTORY COMPLETION OF THE WORK, ARE DONE, NO EXTRA CHARGES WILL BE PAID. THE TENDERERS ARE REQUESTED TO TAKE THIS ASPECT INTO ACCOUNT AND THE QUOTED RATE SHOULD INCLUDE ALL SUCH CONTINGENCIES.

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

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

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

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

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

13.7
EXTRA WORKS THAT ARISE ON ACCOUNT OF CONTRACTOR'S FAULT WILL HAVE TO BE CARRIED OUT BY THE CONTRACTOR FREE OF COST INCLUDING THE SUPPLY OF MATERIAL AND CONSUMABLES

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

MAN-DAY RATE FOR ELIGIBLE EXTRA WORKS :

SINGLE AVERAGE MAN-DAY RATE, INCLUDING OVERTIME IF ANY, AND OTHER SITE EXPENSES AND INCIDENTALS, INCLUDING CONSUMABLES, TOOLS AND TACKLES, FOR CARRYING OUT ANY MAJOR REWORK/ REPAIRS/ RECTIFICATION/ MODIFICATION/ FABRICATION OF 8 HOURS AS MAY ARISE DURING THE COURSE OF ERECTION. (REFER CLAUSES 13.1 TO 13.8 AND 14.2.1 TO 14.2.10) WILL BE **RS. 320/- (RUPEES THREE HUNDRED AND TWENTY ONLY)**

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

SECTION-14
SPECIAL CONDITIONS OF CONTRACT

INSURANCE

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

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

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

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

14.5
IN CASE OF THEFT / DAMAGE / LOSS OF MATERIALS DUE TO NEGLIGENCE OR FAILURE ATTRIBUTABLE TO THE CONTRACTOR, THE EXPENSES INCURRED ON ACCOUNT OF REPAIR/ REPLACEMENT OF SUCH COMPONENTS INCLUDING BHEL'S OVERHEAD EXPENSES AS APPLICABLE (PRESENTLY @ 30%) IN EXCESS OF THE AMOUNT REALIZED FROM THE UNDERWRITERS SHALL BE RECOVERED FROM THE CONTRACTOR. RECOVERY WILL BE LIMITED TO NORMAL DEDUCTIBLE FRANCHISE (DF) / EXCESS AS PER APPLICABLE INSURANCE TARIFF (TAC) GUIDELINES. HOWEVER, IN CASE SUCH INSURANCE CLAIM IS SUMMARILY REJECTED BY THE UNDERWRITERS DUE TO **WILFUL** DAMAGE/LOSS ON THE PART OF THE CONTRACTOR, THE TOTAL COST OF REPAIR/ REPLACEMENT SHALL BE RECOVERED FROM THE CONTRACTOR.

14.6 INSURANCE BY THE CONTRACTOR AND INDEMNIFICATION OF BHEL

BHEL HAVE TAKEN A THIRD PARTY LIABILITY INSURANCE, INDICATING IN THE PROPOSAL FOR SUCH INSURANCE THAT SUB-CONTRACTORS WILL BE TAKING PART IN THE ERECTION WORK DETAILED IN THIS TENDER. HOWEVER, THE TENDERER HAS TO BEAR ANY EXPENSES/ CONSEQUENCES OVER AND ABOVE THE AMOUNT THAT MAY BE REIMBURSED TO BHEL BY SUCH COVERAGE OF THIRD PARTY LIABILITY INSURANCE TAKEN BY BHEL.

SUCH ADDITIONAL LIABILITY WILL BE TO COVER AND INDEMNIFY BHEL AND ITS CUSTOMER OF ALL LIABILITIES WHICH MAY COME UP AND CAUSE HARM/DAMAGE TO OTHER CONTRACTORS/ CUSTOMER/BHEL PROPERTIES/PERSONNEL OR ALL OR ANYBODY RENDERING SERVICE TO BHEL/CUSTOMER OR IS CONNECTED WITH BHEL / CUSTOMER'S WORK IN ANY MANNER WHATSOEVER. THE TENDERER'S SPECIFIC ATTENTION IS ALSO INVITED TO CLAUSE 2.10 OF GENERAL CONDITIONS OF CONTRACT.

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:

EMD for this tender is Rs. 2,00,000/- (Rupees two lakh only). Bidders who have already deposited One Time EMD of Rs. 2.00 lakh will be exempted from submission of any EMD now for this tender.

EMD is to be paid in **cash** (as permissible under Income Tax Act), Pay order or **Demand Draft** only in favour of Bharat Heavy Electricals Limited and payable at Nagpur. **No other form of EMD is acceptable**.

15.1.1 EMD by the Tendered will be forfeited as per Tender Documents if

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

ii) The tendered 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.

15.2 SECURITY DEPOSIT

15.2.1 The successful bidder shall furnish security Deposit. The rate of Security Deposit shall 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 based on award value shall be furnished before start of the work by the Contractor. Amount of Security Deposit shall be aligned with the actual executed value at appropriate stages of the contract period if there is variation from the award value.

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 furnished in the form of BG/DD/Securities from Post Office/FDR by the Contractor before start of the work and the balance 50% may be recovered from the running bills.

viii) EMD of the successful tendered shall be converted as Security Deposit, excepting those bidders who have remitted One Time EMD.

ix) The Security Deposit shall not carry any interest.

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

15.2.2
Security Deposit shall not be refunded to the Contractor except in accordance with the terms of the contract.

APPENDIX-I
SCOPE OF WORK FOR
BOILER & AUXILIARIES including ESP

1.0 SCOPE OF REPLACEMENT, SERVICING AND REFURBISHMENT.

The scope of work is identical for both unit 1 & 2 until otherwise specifically mentioned. The quantity mentioned is per boiler. The quantity is to be multiplied by 2 for both the units.

1.1 Pressure Parts
(All one to one replacement except for the specifically indicated)

(i) Replacement of 50% WW tubes of full length.

(ii) WW around wall blower area for 1.5 meter radius.
(iii) Bolted type seal arrangement for the Water wall "S" Panel.

(iv) Modification of WW tubes at the opening of GR duct for closure. Dismantling of GR duct and modifying the cat house suitably along with supply of required matl.

(v) Provision of Bigger size Manhole door on LHS Bottom WW

(vi) Seal boxes for OBD

(vii) Replacement/alignment of steam cooled wall tubes – 600 RM.

(viii) Wear bar arrangement for the Water wall "S" Panel.

(ix) LTSH terminal coils (For one unit-1 only).

(x) REPLACEMENT OF SH DESH system.

(xi) Replacement of RH DESH system.

(xii) Replacement of Erosion shields for the leading tubes of LTSH for 8 assys (4 assy per side for full depth coverage).

(xiii) Replacement of Erosion shields for the leading tubes of economizer for 8 assys(4 assy per side for full depth coverage).

(xiv) Replacement of Protective shields for the SHH8- SHH9 Header (LTSH supply tubes).

(xv) Final superheater outlet header with links.

(xvi) Pent house sealing replacement for complete sealing of furnace and pent house.

(xvii) Buckstay replacement /strengthening with required channels and beams .All the damaged wall supporting channels shall be replaced.

(xviii) Drum internals – 25%.

(xix) Replacement of floor grills for boiler. For mill area this is excluded since the mill modification has been already carried out by GSECL thro' other vendors.

(xx) Pent house complete revamping along with Skin Casing.

(xxi) Replacement of Re-heater outlet Header.

(xxii) Wherever eroded bends at peep holes are beyond limit the bends will be replaced otherwise these peep hole assemblies will be replaced to make them air tight.

(xxiii) Replacement of required material for the alignment of steam cooled wall tubes / supporting beams wherever required. Replacement of Steam cooled wall tubes as supplied by manufacturing unit.

(xxiv) Providing refractory at the ends of SHH-8 headers.

(xxv) Replacement/ erection of ww tubes and ascertain the formation of proper fireball in firing zone.

1.2 Fuel Firing:

E&C of following is in the scope of contractor.

(i) Air cooled oil guns

(ii) HEA ignitor.

(iii) SADC system:
Installation of power cylinder drives and auxiliaries.

(iv) Burner tilt control:

Existing burner tilt control mechanism is motor operated servo drives. Feedback is not available. New power cylinders are to be introduced.

(v) Gun cooling and scanner air system.

(vi) Replacement of steam traps, insulation of HFO piping. Complete replacement of steam tracing lines and its drains, vents, traps, valves etc for to and fro lines from firing floor to fuel pump house as well as pipes connected to fuel oil tanks.

(vii) Refurbishment of all fuel oil pumps, Heaters, Strainers, Valves of HFO / LDO system.

(viii) Refurbishment of all trip valves and hydro motor valves like atomising air / steam, FO / LDO etc and connected lines at the boiler corners shall be replaced to interface with forth coming new control system. Atomising steam line from PRDS to burner panel is also to be replaced. It is also required to provide boiler main oil FCV along with corner valves.

(ix) Re-routing , E&C of HFO pipe lines along with all the connected accessories are to be done as per site requirements.

1.3 E&C/Replacement of Structural items, Duct & Dampers

(i) Replacements Platform wherever damage is observed and corresponding structures.

(ii) Flue gas duct from APH outlet to ESP inlet.

(iii) Flue gas duct from ESP outlet to ID fan inlet with interconnecting duct & isolation gate.

(iv) Flue gas duct from ID fan outlet to chimney inlet.

(v) APH FG outlet dampers complete replacement. All the existing dampers in the flue gas path including inter connecting are to be replaced. Moreover dampers at FD fan outlet are also to be replaced.

(vi) Wind box connecting expansion joints complete replacement.

(vii) Guillotine gates with motorized actuators shall be replaced at inlet & outlet of ESP and outlet of ID fans. Replacement of interconnecting ducting its dampers / gates at inlet of ESP and ID fans to isolate the individual pass for its maintenance.

(viii) Hot air/gas interconnecting ducts of TAPH:

Replacement of interconnecting ducting its dampers / gates at inlet of ESP and ID fans to isolate the individual pass for its maintenance.

(ix) Expansion joints in gas/air paths:

Racement of expansion joints adjacent to Air heater gas and air paths.

(x) Metallic Expansion bellows:

All expansion bellows in both flue gas duct & air duct. Metallic expansion joints as per existing arrangement one to one replacement is considered.

Dismantling of all mechanical items like mech. ESP, ID fans, Ducting with Connected supports and related systems, existing ESP and its control room etc are in the scope of contracter.

1.4 Lining & Insulation

Due to tangent tube construction, the complete insulation and cladding to be replaced for the first pass and second pass of the pressure parts for effective arresting of air ingress into the system. The duct insulation between air pre heater to ESP and ID fan outlet chimney are to be replaced.100% replacement in main boiler, air duct, flue gas duct and all items recommended for replacement whichever applicable. Complete replacement of insulation cladding & refractory etc for outside + inside of boiler along with supply of required material.

Note: *Above scope of work will retaining the same layout and replacement on one to one basis. The material specification/size for the replacement will be compatible for the design parameter depending on latest sizes and availability with BHEL.*

1.5 Valves

(i) List of Valves to be replaced – As supplied by BHEL as follows:

Sl. No.	Valve Details	Tag No.	Remarks
1.	ERV MS line dresser – 2 ½ " 2500 CLASS	S4	Valve to be replaced
2.	Direct water level gauge/ open end hood 19-3/4" vision Clarke reliance mirror reflection.	B3 B4	All bock valves, isolation valves and the water level gauges to be replaced with new ones.
3.	a) Steam line – 2 nos. SVI" C1500- b) HRH L/R Nos. 4SV 25.250 ata. c) CRH L/R 2 NOS. SV25 100 ata d) Reheater drain valve - 2 nos	100 ata and 250 ata design R 28 to R32	To be replaced by Cl. 1500 and CL 2500 valves. SV 40 - 100 ata
4.	SH Drain valves	SH header drain valve SV 250 ata SHH - 4L, 4R& 5 S-28 - 4L, 4R & 5 SHH - 11, 12 SHH - 14 L & 14 R	Most of the valves are of various makes. The replaced SH drain valves (AIL make 1 – ½" class 1500) not working. All the valves may be replaced with class 2500.
5.	Low load loop lines / SV .65.250 ata III RV 65.250 ata III	250 ata valves HW – 2 Nos. MO 2 Nos.	To be replaced with Class 1500 valves.
6.	SH spray control system isolation valve	250 ata valves S35/GV 150. 250 ata III.	To be replaced with class 1500 valves. Covered under SH-DESH system.
7.	SH spray control system isolation valve	S36/PL NRV 150. 250 ata III	As these 250 ata valves are of old/obsolete design, same to be replaced with class 1500 valves. Covered under SH-DESH system.
8.	SH sampling valves	2 Nos. SV 10. 250 ata	To be replaced with SV 3/8:CL 2500 valve.
9.	Air vent to drum SV 25.250 ata III-4 nos. Air vent to Eco. 2 nos. SV 25.250 ata III – 4 nos. Air vent to SH 12 nos.	250 ata design B42, B43, E 13 S9, S17, S18, S29,	To be replaced with class 2500 valves

Sl. No.	Valve Details	Tag No.	Remarks
	SV 25.250 ata IX – 4 Nos.	S30	
10.	ECO vent & Drain valves / SV 40.250 ATA III	E 7 - 2 nos. 250 ata valves	To be replaced with class 2500 valves.
11.	Phosphate dosing line NRV Globe	25.250 ata III SV 25.250 ata III	Valves to be replaced with class 2500 valves.
12.	CBD & Isolation Valves	250 ata Design	To be replaced with class 2500 SV 1" valves.
13.	Silencer	3+1(Start up vent) Nos (start up vent for one unit only)	Start up vent silencer for unit no 1- one number For the lowest set Safety Valves in MS, HRH lines and drum Silencers are considered. For other Safety Valves, it is not recommended as per the general practice. Start up vent silencer for one unit is available with GSECL.
14.	Fuel atomising system valves	The atomizing block valve is not working due to instrumentation problem. The Pr. Control valve is reported OK.	The lay out is congested and the valves are not approachable for maintenance. The atomizing block valve may be put in operation by attending the instrumentation problem. Re-Lay out may be done to make the valve approachable for service.
15.	Soot blower control valve		1-no
16.	SB MO isolating valve		1-no
17.	SB manual isolating valve		1-no
18.	SB safety valve		1-no
19.	Main steam stop valve(MO)-Actuator		1-no
20.	Main steam by pass valve(MO)- Actuator		1-no
21.	Start up vent valve(MO) - Actuator		1-no

(ii) List of valves needing servicing as per specification requirement:

Sl. No.	Valve Details	Tag No.	Recommendation
1.	Main steam stop valve /GV	S1 (2 nos.) 1 with MOV and second	Overhauling

Sl. No.	Valve Details	Tag No.	Recommendation
	12”C1500 WC9 BW MO	HW.	
2.	Start up vent valve SV-100-250 ata	S6	Overhauling and lapping to be carried out.
3.	Start up vent valve GV-100-250 ata	S5	Valve already replaced with AIL valve - Overhauling.
4.	Superheater outlet safety valve	S2	Overhauling
5.	Drum safety valve / Dresser	B1, B2	Overhauled
6.	CRH Pr. Relief safety valve Dresser – 6” CL 600	R1, R2	Overhauling and tested for popping.
7.	HRH Pr. Relief valve Dresser make 4: CL 600	R3, R4	Overhauling and tested for popping.
8.	Feed check valve / Eco. Inlet valve / PL NRV250-250Ata	E1	Valve replaced with AIL make SCNRV-10” CL 1500 3 years back, Overhauling.
9.	Feed stop valve / GV 250. 250 actual	E2	Overhauling
10.	Feed control valve/ 10” CL1500 with linear actuator MIL make	2 nos.	Overhauling
11.	Feed control isolation valves/GV 250. 250 ata III BW MO with HW operated BPV	4 nos.	Overhauling.
12.	Emergency Blow down valve / SV 65.250 ata III RV 65.250 ata III	B41-HW-2 Nos. B42-MO 2 NOS.	Overhauling.
13.	SH spray control system L/R Isolating valve MOV-2 Nos.	SV-2-1/2” CL1500	Overhauling. . Covered under SH-DESH system
14.	SH spray control isolating valve – 6 nos. HW	SV-2-1/2” CL1500	Overhauling. . Covered under SH-DESH system
15.	SH spray control valve – 2 nos.	1-1/2” CL-1500	Overhauling. . Covered under SH-DESH system
16.	RH spray control ISOLATING valves 6 nos.	R25, R26,R27 SV 25.100 ATA III	Overhauling . . Covered under SH-DESH system
17.	RH spray control valve L/R	1-1/2”cl 600	Overhauling . . Covered

Sl. No.	Valve Details	Tag No.	Recommendation
	2 nos.		under SH-DESH system

BHEL scope of OH of valves covers the supply of all the spares and also if required the supply of spindles and casing etc.

1.6 Soot Blowers

(i) WALL BLOWERS:
35 Blowers are to be replaced with new one. (See point no iii)

(ii) LRSB:

All 24 Nos of LRSB are to be replaced with new one. (See point no iii)

(iii) Piping re-designing for Wall blowers & LRSB and layout changing to have thermal drain system with necessary thermal drain valves and fittings.

(iv) Relocation of Soot Blower control station at 40.3 m Elevation and re- Routing of steam supply lines.

(v) Replacement of soot blowing system valves as specified in clause 3.5 (I) sl no 15-18.

1.7 Fans

(i) ID Fan:

Two number of axial fans per boiler. The ID fans are provided with inlet guide vane control.

Scope of assembly of ID fan:
Following are to be assembled and erected in position.

(a) Fan impeller with shaft and bearings.

(b) Suction box, impeller housing, OGV, diffuser with access doors, drain plugs, lifting hooks,

(c) Inlet guide vane (IGV) control

(d) Foundation sole plates, shims and packers with fasteners

(e) Duplex RTD for remote indication and for alarm / trip contacts

(f) Temperature gauge (mist) for local indication

(g) Flexible coupling with guard

(h) Special tool-bearing cum coupling puller

- All the structures for fans like platforms, staircase, handrailing, canopy etc. are to be renovated / replaced as per requirement.
- Fan handling equipment as per BHEL standard practice.

- Modification of other components like dampers, gates, ducts etc.(Covered in clause 3.3 – v, 3.3 – vii)

(ii) FD fan:

There are two numbers of BHEL make FD fans 'DL-2-52-5' with motor rating of 630kw /1000 rpm in each boiler. Technical specification part-A, chapter 3.1, Cl. 16.00.00, calls for overhauling and servicing of the existing FD fans. For overhauling and servicing, the following items are considered for replacement as supplied for each FD fan:

(a) Shaft assembly	1 set
(b) Impeller assembly	1 set
(c) Bearings	1 set
(d) Shaft seals	1 set
(e) Expansion joints	1 set
(f) IGV assy	1 set (Link operated control mechanism as per GSECL requirement)
(g) Coupling	1 No

(1 set refers to one fan requirement)

- All the structures for FD fans like platforms, staircase, hand railing, canopy etc. are to be renovated / replaced as per requirement.

1.8 Tubular Air Preheater

(i) AIRHEATER – Top blocks – 4 Nos/Boiler: No replacement only repair if any.
Unit 1 - existing retained. Unit 2 – existing retained.

(ii) AIR HEATER – Middle Block ; Twin pass – 4 Nos/Boiler :
Unit 1 – Rplacement with Fresh Supply. Castable Refractory to be applied.
Unit 2 - existing retained only repaired if any.
Existing blocks in Unit 1 will be used as Bottom Blocks for both Unit 1 & 2.

(iii) AIRHEATER – Bottom block – 4 Nos/Boiler – No Fresh supply for replacement.
Unit 1 – 50% of removed Middle Blocks of Unit 1 to be refitted as the bottom blocks.
Unit 2 - 50% Removed Middle Blocks of Unit 1 to be refitted as the bottom blocks.
Castable refractory to be applied for both the units.

Castable refractory for the APH block and Cleaning with water jet

1.9 Piping and Hangers & Supports, fuel oil piping rerouting

Scope of replacement wherever new Supplied:

The following piping systems are specifically included under BHEL's scope of engineering, manufacture and supply of steam generator package has to be re-routed/replaced.

(i) BFD control station piping.

(ii) Aux. PRDS control station piping.

(iii) PRDS spray control station & piping

(iv) Re -routing of FO system piping, AS line & steam tracing piping

(v) Valves associated with above mentioned piping systems.

(vi) Hangers and supports required for the MS,HRH & CRH piping.

(vii)Auxiliary steel structures for the above mentioned piping systems. Auxiliary steel structures (for hangers) mean those structures, which are connected to main columns, auxiliary columns, main beams, secondary beams, floor and wall beams, etc.

(viii) TIG wire for root welding of above piping systems is in the scope of contracter.

(ix) List of Flow nozzles specifically included are Main steam line - 1No

(x) Insulation and lagging for the above piping.

(xi) Replacement of all drain lines, vent lines, impulse piping, all drain vent valves, traps with new one.

2.0 Scope of servicing, replacement, of Electrostatic Precipitator (ESP)

- The general layout of the proposed precipitator is as shown in our drawing.
- The precipitators have been designed to handle a wet gas volume of 211.0 m3/sec. at a temperature of 165 o C.
- The design of the precipitator installation proposed for one boiler is as follows:
  Two (2) electrostatic precipitators each of type FAA-5x37.5M-2x76150-2 comprising five (5) fields in the direction of gas flow and two bus section perpendicular to the gas flow.

The scope of replacement for each boiler is limited to as follows:

2.1. 2 sets of slide support to take care of casing thermal expansions.

2.2. 2 sets of precipitator supporting structure consisting of pre-fabricated columns cross ties, footplates and foundation bolts.

2.3. 2 independently operated single chamber casing consisting of prefabricated wall and roof-panels fabricated from 6 mm mild steel plate adequately reinforced with vertical columns and intermediate stiffeners to withstand the negative pressure and earth quake. The casing is provided with access door.

2.4. 20 sets of insulators each set consisting of 4 support insulators for each emitting system, 1 shaft insulator for each emitting rapping mechanism and one bushing insulator for direct connecting to the transformer/rectifier.

2.5. 20 sets of insulator housings complete with ducting to each transformer. The insulator compartments are of double-walled construction with thermal insulation and are provided with access doors for inspection and service of support insulators of the emitting system.

2.6. 2 sets of Gas distribution screens consisting of double screen arrangement at the inlet and a single screen arrangement at the outlet of each casing. The inlet screen is provided with rapping system.

2.7. 2 sets of Gas screening plates for casing and the hoppers.

2.8. 20 sets of High voltage emitting system consisting of frame work supported from insulators, emitting electrodes of spiral type made out of stainless steel wires and rapping mechanism including rapping shafts, shaft insulators, angularly displaced tumbling hammers, drive arrangements and geared motor.

2.9. 10 sets of Collecting electrode system consisting of supporting arrangement, collecting electrodes fabricated from roll formed sheets of 18 BWG (1.2 mm) thick mild steel, rapping mechanism including shock bars, rapping shafts, angularly displaced tumbling hammers, drive arrangement and geared motor.

2.10. 20 numbers of pyramidal ash collection hoppers made of 6 mm mild steel, complete with level indicators, thermostatically controlled tubular type heating elements of not less than 6 kW per hopper, outlet flanges, poke holes, access doors, walkways beneath the hopper

2.11. 2 sets of 5 mm thick chequer plate outer roofs forming a convenient inspection floor on top of each casing.

2.12. Stairs and walkways for the precipitator.

2.13. 2 sets of Inlet and outlet funnels of 6 mm mild steel plate reinforced with beams and stiffeners and complete with splitters, guide vanes etc.,

2.14. 2 sets of thermal insulation made of lightly bonded mineral wool mattress of insulation of 100 Kg/m3 density for the precipitator walls, roof panels, hoppers and connecting funnels with plain aluminium sheet cladding material.

2.15. 2 sets of test connections of standard size for installation in the duct work for the measurement of the velocity, temperature and dust concentration at the inlet and outlet of the precipitator,

2.16. 10 numbers of Mineral oil immersed transformer rectifier units with associated control cubicles, rated at 95 KV (peak) voltage and 1200 mA (mean) Dc current. Each transformer rectifier set is installed with one number of the latest version of Microprocessor based BHEL Advanced Precipitator Controller(BAPCON)

2.17. One set of BHEL in house developed, PC based, Precipitator Integrated Operating System (NT-IOS) to enable UCB operator to access the ESP controls for control, monitoring and data acquisition functions. This IOS consist of 1 number of PC based controller (IOS-PC), printer, 1 set of microprocessor based rapper controller (RAPCON). The IOS-PC and printer be kept at the UCB. The rapper control panel housing RAPCON will be kept at the ESP control room.

2.18. 2 sets of tubular type heating elements for hopper and support insulator with thermostats and tubular type heaters for shaft insulators.

2.19. 2 sets of electrically operated lifting and handling arrangement for the transformer rectifier sets mounted on the precipitator roof.

2.20. 1 number of LT distribution boards of double front, draw-out type for distributing power to ACPs, ECs, and RAPCON Panel.

2.21. 2 numbers of Auxiliary control panel of double front, draw-out type for providing power to rapping motors, controlling electrical heating elements and other associated electrical equipment on the precipitator.

2.22. 2 sets of Interlock system consisting of key exchange boxes and interlocks for personnel protection arranged so that access to any high voltage equipment is prevented until the high voltage system is de-energised and grounded.

2.23. All the LT power and control cable of type FRLS PVC armoured, ladder type cable tray and tray supports required between :

(a) ESP LT distribution board and ACPs/ ECs/RAPCON panels

(b) Auxiliary control panels and field mounted components in ESP.

(c) Electronic controllers and transformer rectifier sets.

(d) Inter connection cables of RAPCON panels and EC panels.
(For cable estimation, ESP control room location is considered at 10 m distance adjacent to ESP).

2.24. Complete above ground level ESP earthing system.

2.25. High voltage bus duct connections between the transformer rectifier and the high voltage emitting system complete with bushing insulator and disconnecting switches.

2.26. Ash level indicators of RF type for high level and low level in hoppers (Two number n each for one hopper)

2.27. Support services for Conductance of GD Test.

2.28. Support services for Conductance of performance guarantee test at site. The method of conducting the PG test will be based on EPA method 17.

3.0 EXCLUSIONS & TERMINAL POINTS

The following are excluded from Contractor's Scope of Work:

3.1 MAIN BOILER

1.0 Feeding system, milling system, coal piping.

2.0 Chimney with inside flues.

3.0 Elevator, elevator columns, interconnecting platforms between boiler and elevator.

4.0 Piping and valves beyond LDO/HFO Day tank outlet pertaining to Fuel oil tanks, transfer pumps.

3.2 FANS

1.0 PA fans

2.0 Vibration monitoring system for ID & FD fan.

3.3 CRITICAL PIPING

1.0 MS piping, HRH and CRH piping, CBD / IBD Tanks are excluded. However assessment will be carried out and work shall be done at extra price, if required.

3.4 Controls & Instrumentation

1.0 Gravimetric feeder control systems.

2.0 GSECL modified the Mills and feeder controls. Hence GSECL to provide the logic and NTPC to review and provide the sequence to BHEL EDN .for further implementation in DDCMIS after vetting from BHEL Trichy.

3.5 ESP

1.0 Fire extinguishers and illumination at ESP area.

3.6 General

1.0 Comments on tender part B & C may please be read along with this offer for the respective equipment

APPENDIX – II
QUANTIFICATION OF TOTAL WORK

A. **APPROX. QUANTITY OF MATERIAL TO BE DISMANTLED & ERECTED FOR EACH UNIT:**

DISMANTLING OF PRESSURE PARTS : 1850 **MT APPROX**

OTHER THAN PRESSURE PARTS **:** **2200 MT**

ERECTION QUATITY SHALL BE AS FOLLOWS

PRESSURE PARTS **:** **2200 MT APPROX**

OTHER THAN PRESSURE PARTS **:** **2600 MT APPROX**

(OTHER THAN PRESSURE PARTS INCLUDE ESP, FANS, APH, DUCTS,CONTROL & INSTRUMENTATION AND INSULATION ETC.)

APPENDIX-III

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

NO T&P WILL BE PROVIDED BY BHEL TO THE CONTRACTOR FOR THIS PROJECT EXCEPT SOME SPECIAL TOOLS BEING SUPPLIED BY THE MANUFACTURING UNIT AS PART OF REGULAR SUPPLY.

ANNEXURE -IV

LIST OF TOOLS AND PLANTS TO BE ARRANGED BY CONTRACTOR

Guidelines for contractor:

Crawler cranes – 90Mt and above

Tire mounted Hydra cranes

Trailers

Feeler gauge sets, feeler strips of 0.03 to 0.10 mm size.

Dial indicators with magnetic bases (at least 2 dials of diameter 40 mm travel - 5 mm).

Micrometers (inside and outside upto 300 mm, 450mm, 600mm & 1000mm).

Try square.

Set of parallel blocks/ V blocks.

Vernier calipers, (150 and 300 mm), measuring steel tapes and 5 meters steel rulers.

Precision spirit level.

2 sets of D.E. and Ring spanners (6-36mm).

2 sets of Box spanners (6 to 20mm and 22-50mm).

Allen keys of various sizes (from 2mm. Onwards).

U.T. and D.P.Test Kit (with consumables)

Complete kit for carrying out Radiography and evaluating aids

Crowbars tin cutters, pliers (cutting plier, nose plier grip plier circlip-outside and inside).

Screwdrivers and sledge hammers – 10 lbs – 1 lbs.

Adjustable wrenches, pipe wrenches and heck saws.

Single ended spaners (36 Mm and above).

Flat, half round, triagular bearing scrappers-8", to 12".

Files flat round, half round and square, rough and smooth (sizes6", 9" and 12").

Bench Grinders, straight grinders GQ4 and GQ6, Angle grinders.

Reamers upto 30 mm. Taper reamers.

Drilling machine with magnetic stand upto –30 mm with drill bits.

Flexible grinders with grinding stones and cutters of different Shapes and sizes, Angles Grinders and Sander machine.

Number punch, letter punch, centre punch and hole punches etc.

Steel wire brushes, wire brush wheels, nylon wire brushes and Painting bushes.

Lifting devices eye bolts, D-shackles, slings of various sizes Guide rods etc.

Chain pulley blocks 10T, 5 tons, 2 tons pull/lift.

Copper/Brass rods dia ½" to 1 ½"X450 mm.

Tap and die sets 6 to 36 mm.

Surface plate 450 X 450 mm.

Torch light/hand lamps with cables, 230/24 V transformer.

Torque wrench and torque multiplier.

Wooden mallet, Nylon Mallet.

Hand glover-asbestos, Manila rope, asbestos cloth leather and Rubber gloves.

Set of needle files.

Air blower – electric.

Electric drills – ¼", ½", 5/8" etc

Ball pen hammer of various sizes.

Gas cutting and heating set with torches regulators, hoses and cylinder minimum two sets).

Arc welding generator/rectiformers with regulator, cables, Electrode holders and shields, TIG welding holders.

Huck bolting machine.

Tube bending machine.

Pneumatic – grinders.

Hose pipes for compressed air.

Bench vices.

Hydraulic jacks 5, 10, 25 & 50, 100 tons capacity, screw jack 5 to 10 tons.

Ash blasting nozzles with hose pipes and tarpaulin for covering And covering arrangement while carrying out blasting so that dust does not fly off.

Hydraulic pump for testing coolers.

Electric switchboards and flood light arrangements with fuse boxes and isolating switches, plugs and sockets.

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.

Pedestal fans/air coolers.

Wooden sleepers..

Magnifying glass.

Fibre helmet.

Gas cutting/welding goggles, Grinding goggles.

Bearing pullers.

Tarpaulin.

Generator wedging tools.

Small Portable air compressors

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.

APPENDIX – V

ANALYSIS OF UNIT RATES

SL. NO.	DESCRIPTION	% OF QUOTED RATE	REMARKS
01	SITE FACILITIES VIZ., ELECTRICITY, WATER OTHER INFRASTRUCTURE.		
02	SALARY AND WAGES + RETRENCHMENT BENEFITS		
03	CONSUMABLES		
04	T&P DEPRECIATION & MAINTENANCE		
05	ESTABLISHMENT & ADMINISTRATIVE EXPENSES		
06	OVERHEADS		
07	PROFIT		
TOTAL		100%	

SIGNATURE OF THE TENDERER

DATE:

APPENDIX-VII

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

SL. NO.	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											
SO ON												
	MONTH WISE TOTAL											

SIGNATURE OF TENDERER

DATE:

APPENDIX–VIII

FORMAT FOR DEPLOYMENT PLAN FOR MAJOR TOOLS AND PLANTS

SL. NO.	DESCRIPTION & CAPACITY OF T&P	MONTHS										
		1	2	3	4	5	6	7	8	9	10	SO ON
01												
02												
03												
04												
05												
06												
07												
08												
09												
10												
SO ON												

SIGNATURE OF THE TENDERER

DATE:

APPENDIX-IX
CONCURRENT COMMITMENTS

SN	FULL POSTAL ADRESS OF CLIENT AND NAME OF OFFICER IN-CHARGE	DESCRIPTION OF THE WORK	VALUE OF THE CONTRACT	COMMENC-EMENT DATE	SCHEDU-LED COMPLE-TION	% COMPL-TD. AS ON DATE	ANTICIPA-TED COMPLN. DATE	REMARKS

DATE

SIGNATURE OF THE TENDERER

APPENDIX–X

DETAILS OF SIMILAR WORK DONE DURING THE LAST SEVEN YEARS

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

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