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

NO. BHE/PW/PUR/GSEG HAZIRA-HRSG+PPE/613

FOR

RECEIPT/COLLECTION/ LOADING/ UNLOADING/ TRANSPORATION OF MATERIALS FROM BHEL/CLIENT'S STORES /STORAGE YARDS TO SITE OF WORK, ERECTION, TESTING, COMMISSIONING, FINAL PAINTING AND HANDING OVER OF 1X 292 TPH HEAT RECOVERY STEAM GENERATOR AND ITS AUXILIARIES, STEEL STACK WITH COMPLETE PLATFORMS ETC INCLUDING ELECTRICAL WORKS OF STACK, PIPING (POWER CYCLE PIPING, INTEGRAL, PIPING, REGENERATIVE CYCLE PIPING INCLUDING INSTRUMENT AIR & SERVICE AIR PIPING ETC.) WITH ASSOCIATED FITTINGS, VALVES, HANGERS & SUPPORTS, APPLICATION OF THERMAL INSULATION OF HRSG WITH AUXILIARIES, STEEL STACK, PIPINGS WITH VALVES & FITTINGS INCLUDING GAS TURBINE AND STEAM TURBINE SET EQUIPMENTS, HEATERS, DEAERATOR, TANKS, VESSELS & PIPINGS ETC FOR 1X350 MW COMBINED CYCLE POWER PLANT

AT

GUJARAT STATE ENERGY GENERATION LIMITED

NEAR HAZIRA, VILLAGE MORA

POST BHATHA, SURAT HAZIRA ROAD,
DISTT.-SURAT, PIN : 394510
GUJARAT

PART I - TECHNICAL BID

BOOK NO.

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

C O N T E N T S

SN	DESCRIPTION	SECTION/ APPENDIX NO.	NO. OF PAGES
	APPENDICES		
22	DETAILS OF QUANTITIES/SCOPE OF WORK	APPENDIX-I	10
23	DRAWINGS ATTACHED AS PART OF TENDER DOCUMENT	APPENDIX-II	1
24	LIST OF T&P TO BE PROVIDED BY BHEL FREE OF CHARGE ON SHARING BASIS	APPENDIX-III	1
25	MAJOR TOOL & PLANTS & MMD TO BE DEPLOYED BY THE CONTRACTOR	APPENDIX-IV	2
26	FORMAT FOR MONTHWISE MANPOWER DEPLOYMENT PLAN	APPENDIX-V	1
27	FORMAT FOR DEPLOYMENT PLAN FOR MAJOR TOOL & PLANTS OF CONTRACTOR	APPENDIX-VI	2
28	CONCURRENT COMMITMENTS	APPENDIX-VII	1
29	ANALYSIS OF UNIT RATE	APPENDIX-VIII	1
30	CUSTOMER'S SPECIFICATION FOR SURFACE PREPARATION AND FINAL PAINTING " SPEC. NO. TCE.4915A-H-500-001"	APPENDIX-IX.	13
31	DETAILS OF SIMILAR WORK DONE IN LAST SEVEN YEARS	APPENDIX-X	1
32	**RATE SCHEDULE** (PART-II: PRICE BID)		**@**

LEGEND:

$: Included in Tender Specifications Part-I. Hosted in BHEL web page (www.bhel.com) as file titled **"NIT+GCC-613".**

@: Issued as separate hard copy booklet 'Tender Specifications Part-II (Price Bid-613)'. Hosted in BHEL web page (www.bhel.com) as file titled **"PRICE BID-613"**

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-613"**

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

TENDER SPECIFICATION DOCUMENT ISSUE DETAILS

TENDER SPECIFICATION NO. **BHE/PW/PUR/GSEG HAZIRA-HRSG+PPE/613**

NAME OF THE WORK:

RECEIPT/COLLECTION/ LOADING/ UNLOADING/ TRANSPORATION OF MATERIALS FROM BHEL/CLIENT'S STORES /STORAGE YARDS TO SITE OF WORK, ERECTION, TESTING, COMMISSIONING, FINAL PAINTING AND HANDING OVER OF 1X 292 TPH HEAT RECOVERY STEAM GENERATOR AND ITS AUXILIARIES, STEEL STACK WITH COMPLETE PLATFORMS ETC INCLUDING ELECTRICAL WORKS OF STACK, PIPING (POWER CYCLE PIPING, INTEGRAL, PIPING, REGENERATIVE CYCLE PIPING INCLUDING INSTRUMENT AIR & SERVICE AIR PIPING ETC.) WITH ASSOCIATED FITTINGS, VALVES, HANGERS & SUPPORTS, APPLICATION OF THERMAL INSULATION OF HRSG WITH AUXILIARIES, STEEL STACK, PIPINGS WITH VALVES & FITTINGS INCLUDING GAS TURBINE AND STEAM TURBINE SET EQUIPMENTS, HEATERS, DEAERATOR, TANKS, VESSELS & PIPINGS ETC FOR 1X350 MW COMBINED CYCLE POWER PLANT

AT

GUJARAT STATE ENERGY GENERATION LIMITED

NEAR HAZIRA, VILLAGE MORA

POST BHATHA, SURAT HAZIRA ROAD,
DISTT.-SURAT, PIN : 394510
GUJARAT

EARNEST MONEY DEPOSIT: Please see Special Conditions of Contract.

LAST DATE FOR TENDER SUBMISSION: Please obtain updated information from web page "http://www.bhel.com" → Tender Notifications → View Corrigendum.

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

M/s. ……

…….

PLEASE NOTE:
THESE TENDER SPECS DOCUMENTS ARE NOT TRANSFERABLE.

For Bharat Heavy Electricals Limited

Dy. General Manager (Purchase)
Place: Nagpur
Date:

BHARAT HEAVY ELECTRICALS LIMITED
(A GOVERNMENT OF INDIA UNDERTAKING)
POWER SECTOR - WESTERN REGION
SHREEMOHINI COMPLEX
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:

- CONTRACTOR SHOULD HAVE ADEQUATE RESOURCES INCLUDING MAJOR T&PS AT HIS DISPOSAL FOR THIS JOB.
- CONTRACTOR SHOULD HAVE SOUND FINANCIAL STABILITY.
- TENDERER SHOULD MEET QUALITY REQUIREMENT REGARDING WORKMANSHIP, DEPLOYMENT OF PERSONNEL, ERECTION TOOLS AND NECESSARY INSPECTION, MEASUREMENT & TESTING INSTRUMENTS.
- ALL INFORMATION AS CALLED FOR IN VARIOUS APPENDICES AND CLAUSES OF TENDER SPECIFICATION SHOULD BE FURNISHED IN COMPLETENESS. PLEASE REFER THE CHECKLIST.
- CLARIFICATION ON TENDER IF ANY, SHALL BE OBTAINED BY THE TENDERER BEFORE SUBMITTING THEIR OFFER.
- OFFERS MUST BE SUBMITTED WITHOUT ANY DEVIATION.
- 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.
- **TENDERER SHALL NOTE THAT THEIR OFFER WILL BE CONSIDERED SUBJECT TO THE APPROVAL OF BHEL'S CUSTOMER.**

PROJECT INFORMATION

Sl.No.	Description	Details
1	Owner	Gujarat State Energy Generation Limited (GSEG)
2	Project Title	1x350 MW Combined Cycle Power Plant
3	Location	Hazira, next to existing GSEG's 156.1 MW CCPP, Near Hazira, Village Mora, Post Bhatha, Surat-Hazira Road, Hazira, Dist.-Surat-394510, Gujarat State, India
4	Power Station site Graded Level Elevation Above Mean Sea Level (MSL)	5.65 Meters above MSL
5	Latitude/ Longitude	72° 38' E/ 21° 08' N
6	Nearest Railway Station	Surat (distance about 30 Km)
7	Nearest Town	Surat (about 20 Km)
8	Nearest Airport	Surat- 20 Km, Mumbai– 300Km, by road
9	Road Approach	From State Highway NH08 running between Ahmedabad and Mumbai. The village –Mora in on NH08 and where the distance of plant is about 5 Km.
10	Site Ambient Conditions	
10.1	Highest ever temp recorded (Dry Bulb)	45.6 Deg C
10.2	Lowest ever temp recorded (Dry Bulb)	4.4 Deg C
10.3	Maximum Daily Average (Dry Bulb)	33.0 Deg C
10.4	Average Mean Dry Bulb Temp	33.0 Deg C
10.5	Average Mean Wet Bulb Temp	28.5Deg C
10.6	Relative Humidity	Max – 89%, Min – 10%, Average-70%
11.7	Basic Wind speed	8.1 Meter / Hr.
11.8	Average Rain fall	1203 mm.
11.9	Seismic Zone	Zone III

The bidder is advised to visit and examine the site of WORKS and its surroundings and obtain for himself on his own responsibility all information that may be necessary for preparing the bid and entering into the CONTRACT. All costs for and associated with site visits shall be borne by the bidder.

CHECK LIST

(VIDE PARA 1.3 OF SECTION-I OF GENERAL CONDITIONS OF CONTRACT)

1	NAME OF THE TENDERER WITH ADDRESS		
2	NATURE OF THE FIRM	LIMITED / PARTNERSHIP / PROPRIETARY	
3	EMD DETAILS (Rs. 2.0 LACS BY DD ONLY OR ONE TIME EMD)		
4	VALIDITY OF OFFER (REQUIRED 6 MONTHS FROM DUE DATE)		
5	MOBILIZATION TIME (NOT EXCEEDING 15 DAYS FROM FAX LOI)		
6	WHETHER NO DEVIATION CERTIFICATE FURNISHED	YES	NO
7	TENDERER HAS VISITED THE PROJECT SITE AND ACQUAINTED WITH THE SITE CONDITIONS	YES	NO
8	DETAILS OF CONCURRENT JOBS ARE FURNISHED (AS PER RELEVANT APPENDIX)	YES	NO
9	HEAD QUARTER'S ORGANISATION IS FURNISHED	YES	NO
10	PROPOSED SITE ORGANISATION IS FURNISHED	YES	NO
11	FINANCIAL STATUS OF THE COMPANY (RELEVANT ANNEXURE OF GCC) IS FURNISHED	YES	NO
12	PROFIT & LOSS ACCOUNT FOR PRECEDING THREE YEARS IS FURNISHED	YES	NO
13	LATEST SOLVENCY CERTIFICATE FROM THE BANKER IS FURNISHED	YES	NO
14	LATEST INCOME TAX CLEARANCE CERTIFICATE OR COPY OF PAN CARD ACCOMPANIED BY 'IT RETURN' COPY IS FURNISHED	YES	NO
15	MANPOWER DEPLOYMENT PLAN (AS PER RELEVANT APPENDIX) IS FURNISHED	YES	NO
16	MONTHWISE DEPLOYMENT PLAN FOR MAJOR T&P (AS PER RELEVANT APPENDIX) IS FURNISHED	YES	NO
17	ANALYSIS OF UNIT RATES QUOTED (AS PER RELEVANT APPENDIX) IS FURNISHED	YES	NO
18	POWER OF ATTORNEY ENCLOSED IN FAVOUR OF PERSON MAKING OFFER.	YES	NO

19	DETAILS OF SIMILAR WORK DONE IN LAST SEVEN YEARS (AS PER RELEVANT APPENDIX) AND SUPPORTING DOUCMENTS FURNISHED.	YES	NO
20	PROGRAMME FOR THE SUBJECT WORK FURNISHED	YES	NO
21	BIDDER HAS FMILIARIZED HIMSELF WITH ALL RELEVANT LOCAL LAWS & CONDITIONS.	YES	NO
22	WHETHER ALL THE PAGES OF THE TENDER DOCUMENTS ARE READ, UNDERSTOOD AND SIGNED	YES	NO
23	WHETHER THE FOLLOWING DETAILS PERTAINING TO YOUR BANK ACCOUNT DULY ENDORSED BY THE BANK HAVE BEEN FURNISHED {TO ENABLE BHEL RELEASE PAYMENTS THROUGH ELECTRONIC FUND TRANSFER (EFT/RTGS) AS SPECIFIED IN SECTION 12 } 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	YES	NO

NOTE: STRIKE OFF YES OR NO, AS APPLICABLE

DATE: SIGNATURE OF TENDERER

DECLARATION BY BIDDER'S AUTHORIZED SIGNATORY

I, HEREBY CERTIFY THAT ALL THE INFORMATION AND DATA FURNISHED BY ME WITH REGARD TO THIS TENDER SPECIFICATION NO.**BHE/PW/PUR/GSEG HAZIRA-HRSG+PPE/613** TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.I HAVE GONE THROUGH THE SPECIFICATION, CONDITIONS AND STIPULATIONS IN DETAIL AND AGREE TO COMPLY WITH THE REQUIREMENTS AND INTENT OF THE SPECIFICATION.I FURTHER CERTIFY THAT I AM DULY AUTHORISED REPRESENTATIVE OF THE UNDER MENTIONED TENDERER AND A COPY OF VALID POWER OF ATTORNEY TO THIS EFFECT IS ALSO ENCLOSED.

SIGNATURE OF TENDERER

DATE:

CERTIFICATE OF NO DEVIATION

TENDER SPECIFICATION: NO.BHE/PW/PUR/GSEG HAZIRA-HRSG+PPE/613

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

HEREBY CERTIFY THAT IN OUR OFFER I/WE HAVE NEITHER SET ANY TERMS AND CONDITIONS NOR THERE ANY DEVIATION TAKEN FROM THE CONDITIONS STIPULATED BY BHEL, EITHER TECHNICAL OR COMMERCIAL AND I/WE AGREE TO ALL THE TERMS AND CONDITIONS STIPULATED BY BHEL IN THE TENDER SPECIFICATION INCLUDING ASSOCIATED AMENDMENTS AND CLARIFICATIONS.

SIGNATURE OF THE TENDERER

DATE:

Section-3
Offer of the Contractor

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

Dear Sir,

I/we hereby offer to carry out the work detailed in tender specification no. **BHE/PW/PUR/GSEG HAZIRA-HRSG+PPE/613** for 1X350 MW CCPP HAZIRA, Gujarat, issued by Bharat Heavy Electricals Limited, Power Sector-Western Region, Nagpur, in accordance with the terms and conditions thereof.

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

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

I/WE HAVE DEPOSITED / FORWARDED HEREWITH THE EARNEST MONEY DEPOSIT FOR A SUM OF RS. 2,00,000/- (RUPEES TWO LAKH ONLY) DETAILS OF EMD PAYMENT ARE FURNISHED IN THE CHECK LIST.

EMD shall be refunded should our offer not be accepted / EMD **need not be refunded and the amount may be treated as "one time EMD" for erection and commissioning tenders of BHEL-PSWR, Nagpur**. Should our offer be accepted, i/we further agree to deposit security deposit for the work as provided for in the tender specification within the stipulated time as may be indicated by BHEL, Power Sector-Western Region, Nagpur.

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

Place: Signature of Bidder:

Date : Address:

Witnesses with Their Address

	Signature	Name	Address
1.			
2.			

SECTION– 4

SPECIAL CONDITIONS OF CONTRACT

4.0 GENERAL

THE SCOPE OF WORK COVERS THE COMPLETE WORK OF COLLECTION OF MATERIALS FROM BHEL/CLIENT'S STORES/STORAGE YARD INCLUDING LOADING, TRANSPORTATION TO ERECTION SITE/ SITE OF WORK, ERECTION, TESTING, COMMISSIONING, PROVIDING ASSISTANCE FOR COMMISSIONING AND HANDING OVER OF COMPLETE HRSG & ITS AUXILIARIES AND STEEL STACK INCLUDING ITS ELECTRICAL WORKS, POWER CYCLE PIPING INCLDING P-91 MATERIALS, REGENERATIVE SYSTEM PIPING WITH ASSOCIATED FITTINGS, VALVES, SUPPORTS INCLUDING TANKS & VESSELS, APPLICATION OF THERMAL INSULATION OF HRSG WITH AUXILIARIES, STEEL STACK, PIPINGS WITH VALVES & FITTINGS INCLUDING GAS TURBINE AND STEAM TURBINE SET EQUIPMENTS, HEATERS, DEAERATOR, TANKS, VESSELS & PIPINGS ETC. THE WORK IS MAINLY CATEGORISED AS FOLLOWS:

1) ERECTION, TESTING AND COMMISSIONING OF 1X292 TPH HRSG AND ITS AUXILIARIES

2) ASSEMBLY, ERECTION INLUDING WELDING & NDE ETC.OF STEEL STACK / CHIMNEY OF 75 M HEIGHT WITH ASSOCIATED ELECTRICAL WORKS OF AVIATION LIGHTS, EARTHING & LIGHTENING ARRESTORS ETC.

3) ERECTION, WELDING, TESTING AND COMMISSIONING WITH RADIOGRAPHY, NDE & HEAT TREATMENT ETC. OF POWER CYCLE PIPING INCLUDING P-91 MATERIAL PIPINGS WITH ASSOCIATED VALVES, HANGERS & SUPPORTS AND FITTINGS ETC.

4) ERECTION, WELDING, TESTING AND COMMISSIONING WITH RADIOGRAPHY, NDE & HEAT TREATMENT ETC. OF REGENERATIVE PIPING WITH ASSOCIATED VALVES, HANGERS & SUPPORTS, FITTINGS ETC.

5) PREPARATION & CHIPPING OF CIVIL FOUNDATIONS AND GROUTING OF FOUNDATIONS / PACKERS / FOUNDATION BOLTS / FRAMES ETC.

6) APPLICATION OF THERMAL INSULATION & LINING ON HRSG WITH ASSOCIATED AUXILIARIES / EQUIPMENTS, STEEL STACK, TANKS / VESSELS, PIPINGS WITH VALVES & FITTINGS INCLUDING GAS TURBINE AND STEAM TURBINE SET EQUIPMENTS, HEATERS, DEAERATOR, TANKS, VESSELS & PIPINGS ETC.

7) CHEMICAL CLEANING/ FLUSHING INCLUDING EDTA CLEANING, FLUSHING WITH AIR / WATER / OIL ETC., HYDRO TESTING, STEAM BLOWING INCLUDING LUBE OIL FLUSHING ETC. OF EQUIPMENTS, PIPINGS AND OTHER ASSOCIATED SYSTEMS COVERED UNDER THE SCOPE

8) FINAL PAINTING INCLUDING SURFACE PREPARATION, CLEANING, MARKING OF IDENTIFICATION MARKS, COLOUR BANDS, DIRECTION OF ROTATION / FLOW MARKS, LEGENDS ETC. AS PER SITE REQUIREMENT.

4.1 GENERAL RESPONSIBILITIES

4.1.1
THE INTENT OF SPECIFICATION IS TO PROVIDE ERECTION, TESTING AND COMMISSIONING 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.

4.1.2
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.

4.1.3
THE WORK SHALL BE EXECUTED UNDER THE USUAL CONDITIONS AFFECTING MAJOR POWER PLANT CONSTRUCTION AND IN CONJUNCTION WITH NUMEROUS OTHER OPERATIONS AT SITE. THE CONTRACTOR AND HIS PERSONNEL SHALL COOPERATE WITH PERSONNEL OF CUSTOMER'S CONTRACTOR'S, CO-ORDINATING HIS WORK WITH OTHERS AND PROCEED IN A MANNER THAT SHALL NOT DELAY OR HINDER THE PROGRESS OF WORK AS A WHOLE.

4.1.4
CONTRACTOR SHALL ERECT, TEST AND COMMISSION ALL THE EQUIPMENTS AND AUXILIARIES AS PER THE SEQUENCE & METHODOLOGY PRESCRIBED BY BHEL. THE BHEL ENGINEER DEPENDING UPON THE TECHNICAL REQUIREMENTS, AVAILABILITY OF MATERIALS, FRONTS AND KEEPING IN VIEW THE OVERALL PROJECT SCHEDULE, WILL DECIDE THIS. NO CLAIMS FOR EXTRA PAYMENT FROM THE CONTRACTOR WILL BE ENTERTAINED ON THE GROUND OF DEVIATION FROM THE METHODS ADOPTED IN ERECTION OF SIMILAR SETS ELSEWHERE.

4.1.5
THE WORK COVERED UNDER THIS SPECIFICATION IS OF HIGHLY SOPHISTICATED NATURE, REQUIRING THE BEST QUALITY WORKMANSHIP, ENGINEERING AND CONSTRUCTION MANAGEMENT. THE CONTRACTOR SHOULD ENSURE SUCCESSFUL AND TIMELY COMPLETION OF THE WORK. THE CONTRACTOR MUST DEPLOY ADEQUATE QUANTITY OF TOOLS, CONSTRUCTION AIDS, EQUIPMENT ETC. CONTRACTOR WILL HAVE TO ALSO DEPLOY ADEQUATE TRAINED, QUALIFIED AND EXPERIENCED SUPERVISORY STAFF AND SKILLED PERSONNEL.

4.1.6
ALL NECESSARY CERTIFICATES AND LICENSES, PERMITS & CLEARANCES REQUIRED TO CARRY OUT THIS WORK ARE TO BE ARRANGED BY THE CONTRACTOR EXPEDITIOUSLY AT HIS COST. CONTRACTOR SHALL SPECIFICALLY NOTE THAT THE PROJECT UNDER THIS TENDER SPECIFICATION IS IN THEIR EXISTING GAS BASED PLANT PREMISE WHICH IS IN OPERATION AND ALSO THIS IS LOCATED CLOSE TO SURAT CITY RANGE WHICH MAY NECESSITATE CERTAIN SPECIFIC CLEARANCES TO BE OBTAINED. CONTRACTOR SHALL OBTAIN ALL INFORMATIONS WITH REGARD TO APPLICABLE CLEARANCES REQUIRED FOR INSTALLATIONS CONVERED IN THIS SCOPE OF WORK AND OBTAIN SUCH CLEARANCES AND BEAR ALL COST & EXPENSES FOR THE SAME.

4.1.7
ALL TOOLS, TACKLES, FIXTURES, EQUIPMENTS, MATERIALS HANDLING AND TRANSPORTATION, 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 RESOURCES SHALL BE DONE ONLY ON THE APPROVAL OF BHEL. BHEL WILL BE PROVIDING THEIR T & P ON SHARING BASIS FOR ERECTION AND RELATED ACTIVITIES AT SITE AS PER DETAILS SPECIFIED IN SECTIONS-7.

4.1.8
DURING THE COURSE OF ERECTION, TESTING AND COMMISSIONING CERTAIN REWORK/ MODIFICATION/ RECTIFICATION/ REPAIR/ FABRICATION ETC, WILL BE NECESSARY ON ACCOUNT OF FEED BACK FROM VARIOUS POWER STATION UNITS ALREADY COMMISSIONED AND/ OR UNITS UNDER ERECTION AND COMMISSIONING AND ALSO ON ACCOUNT OF DESIGN DISCREPANCIES OR MANUFACTURING DEFECTS AND SITE OPERATION/ MAINTENANCE REQUIREMENTS. THIS WILL ALSO INCLUDE MODIFICATIONS/ RE-WORKS SUGGESTED BY FES/ OTHER INSPECTION GROUP. CONTRACTOR SHALL CARRY OUT SUCH REWORK/ MODIFICATION/ RECTIFICATION/ FABRICATION/ REPAIR ETC, PROMPTLY AND EXPEDITIOUSLY. DAILY LOG SHEETS SIGNED BY BHEL ENGINEER AND INDICATING THE DETAILS OF WORK CARRIED OUT, MAN-HOURS ETC SHALL BE MAINTAINED BY THE CONTRACTOR. CLAIM OF CONTRACTOR IF ANY, FOR SUCH WORKS WILL BE GOVERNED BY CLAUSES 13.1 TO 13.8.

4.1.9
ALL WORKS SUCH AS CLEANING, LEVELING, ALIGNING, TRIAL ASSEMBLY, DISMANTLING OF CERTAIN EQUIPMENTS/ COMPONENTS FOR CHECKING AND CLEANING, SURFACE PREPARATION, FABRICATION OF SHEETS, TUBES AND PIPES AS PER GENERAL ENGINEERING PRACTICE AND AS PER BHEL ENGINEER'S INSTRUCTIONS AT SITE, CUTTING, WELD DEPOSITING, GRINDING, STRAIGHTENING, CHAMFERING, FILING, CHIPPING, DRILLING, REAMING, SCRAPPING, LAPPING, FITTING UP ETC, AS MAY BE APPLICABLE IN SUCH ERECTION WORKS AND WHICH ARE TREATED INCIDENTAL TO THE ERECTION WORKS AND NECESSARY TO COMPLETE THE WORK SATISFACTORILY, SHALL BE CARRIED OUT BY THE CONTRACTOR AS PART OF THE WORK.

4.1.10
THE CONTRACTOR SHALL PROVIDE ALL REQUIRED FIXTURES, CONCRETE BLOCK SUPPORTS, WOODEN SLEEPERS, STEEL STRUCTURES REQUIRED FOR JIGS & FIXTURES, TEMPORARY SUPPORTS AND SCAFFOLDS, LADDERS ETC, ANCHORS FOR LOAD AND GUIDE PULLEYS REQUIRED FOR SUCCESSFUL COMPLETION OF WORK EXCEPTING THOSE WHICH ARE SPECIFICALLY IN BHEL SCOPE. ALL EXTRANEOUS STEEL AND SCAFFOLDING MATERIAL, LADDERS, STEPS ETC., WELDED ON THE STRUCTURAL OR OTHER COMPONENTS DURING ERECTION SHOULD BE CUT & REMOVED AND SUCH AREAS BE FINISHED PROPERLY AS PER BHEL ENGINEER'S INSTRUCTIONS.

4.1.11
NO MEMBERS OF THE STRUCTURE/PLATFORM, PIPES, GRILLS, PLATFORMS, OTHER SYSTEM COMPONENTS AND AUXILIARIES SHOULD BE CUT WITHOUT SPECIFIC APPROVAL OF BHEL ENGINEER. AFTER COMPLETION OF WORK, THE STRUCTURES/ PLATFORM / GRILLS CUT SHALL BE MADE GOOD NEATLY AS INSTRUCTED BY BHEL ENGINEER.

4.1.12
CONTRACTOR SHALL TAKE DELIVERY OF THE COMPONENTS, EQUIPMENTS, CHEMICALS, LUBRICANTS ETC FROM THE BHEL/CLIENT'S STORES/STORAGE AREA AFTER GETTING THE APPROVAL OF BHEL ENGINEER ON STANDARD REQUISITION FORMS TO BE SPECIFIED BY BHEL. COMPLETE AND DETAILED ACCOUNT OF THE EQUIPMENTS ERECTED AS WELL AS THE PROGRESS SHALL BE SUBMITTED TO THE BHEL ENGINEER AS DIRECTED.

4.1.13
CONTRACTOR SHALL PLAN AND TRANSPORT EQUIPMENTS, COMPONENTS FROM STORAGE YARD / STORES TO ERECTION SITE AND ERECT THEM IN SUCH A MANNER AND SEQUENCE THAT MATERIAL ACCUMULATION AT SITE DOES NOT LEAD TO CONGESTION AT SITE OF WORK. MATERIALS SHALL BE STACKED NEATLY, PRESERVED AND STORED IN THE CONTRACTOR'S SHED AND AT WORK AREAS IN AN

ORDERLY MANNER. IN CASE IT IS NECESSARY TO SHIFT AND RE-STACK THE MATERIALS KEPT AT WORK AREAS/ SITE TO ENABLE OTHER AGENCIES TO CARRY OUT THEIR WORK OR FOR ANY OTHER REASON, CONTRACTOR SHALL DO IT MOST EXPEDITIOUSLY. NO CLAIM FOR EXTRA PAYMENT FOR SUCH WORK WILL BE ENTERTAINED.

4.1.14
THE RATES QUOTED IN RATE SCHEDULE SHALL BE INCLUSIVE OF WELDING, BOLTING, FASTENING, JOINTING, RADIOGRAPHY, PRE-HEATING, POST WELD HEAT TREATMENTS/ STRESS RELIEVING, DESTRUCTIVE/NON-DESTRUCTIVE EXAMINATION (NDE) ETC AS APPLICABLE

4.1.15
THE CONTRACTOR SHALL HAVE TOTAL RESPONSIBILITY FOR ALL EQUIPMENTS AND MATERIALS IN HIS CUSTODY AT HIS STORES, LOOSE, SEMI-ASSEMBLED, ASSEMBLED OR ERECTED BY HIM AT SITE. CONTRACTOR SHALL EFFECTIVELY PROTECT THE FINISHED WORKS FROM ACTION OF ALL WEATHERS 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**.**

4.1.16 **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 / CHEMICALS, EXCEPTING THE PRIMER & PAINT, FOR THE ABOVE WORK SHALL BE PROVIDED BY BHEL.

4.1.17
THE CONTRACTOR SHALL MAKE SUITABLE SECURITY ARRANGEMENTS INCLUDING EMPLOYMENT OF SECURITY PERSONNEL AND ENSURE PROTECTION OF ALL MATERIALS/EQUIPMENT IN THEIR CUSTODY AND INSTALLED EQUIPMENTS FROM THEFT / FIRE / PILFERAGE AND ANY OTHER DAMAGES AND LOSSES.

4.1.18
CONTRACTOR SHALL COLLECT ALL SCRAP MATERIALS PERIODICALLY FROM VARIOUS AREA OF WORK SITE AND PRE- ASSEMBLY AREA, DEPOSIT THE SAME AT THE PLACE EARMARKED AT SITE OR SHIFT THE SAME TO A PLACE EARMARKED IN BHEL / CLIENT'S STORES. IN CASE OF FAILURE OF CONTRACTOR IN COMPLIANCE OF THIS REQUIREMENT, BHEL WILL MAKE SUITABLE ARRANGEMENT AT CONTRACTOR'S RISK AND COST.

4.1.19
THE ENTIRE SURPLUS, DAMAGED, SCRAP, UNUSED MATERIALS, PACKAGE MATERIALS / BOXES / CONTAINERS, SPECIAL TRANSPORTING FRAMES ETC, SHALL BE RETURNED TO BHEL STORES BY THE CONTRACTOR WITH PROPER RECORDS.

4.1.20
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 AFFECTED WITH DEPARTMENTAL CHARGES FROM THE CONTRACTOR. THE ALLOWANCE TOWARDS SUCH WASTAGE SHALL BE IN LINE WITH STANDARD ENGINEERING PRACTICES, STANDARDS/ CODES AS MAY BE APPLICABLE. DECISION OF BHEL ON THIS WILL BE FINAL AND BINDING ON THE CONTRACTOR. IN ADDITION TO ABOVE, THERE COULD BE INVISIBLE SCRAP/

WASTAGE I.E. WHICH CAN NOT BE SEEN PHYSICALLY AND LOST IN THE PROCESS. THE TOTAL OF INVISIBLE SCRAP/ WASTE SHALL NOT EXCEED 1%.

4.1.21
STRUCTURAL MATERIALS REQUIRED FOR THE SUPPORTING / OPERATING PLATFORMS REQUIRED FOR THE VALVES/EQUIPMENTS AT VARIOUS LEVELS FOR THE SAFE OPERATION WILL BE ISSUED IN RANDOM SIZES TO THE CONTRACTOR FREE OF COST. HOWEVER, THE CONTRACTOR'S QUOTED RATE SHALL INCLUDE FABRICATION AND ERECTION OF ALL SUCH OF PLATFORMS AT SITE AND NO EXTRA PAYMENTS SHALL BE ALLOWED FOR THIS AND ONLY TONNAGE RATE APPLICABLE WILL BE PAYABLE.

4.1.22
ALL TEMPORARY LINES INCLUDING CHEMICAL CIRCULATION PUMPS REQUIRED FOR CHEMICAL CLEANING / EDTA CLEANING, HYDRAULIC TESTING, STEAM BLOWING, ETC., SHALL BE SUPPLIED IN 'AS IS WHERE IS' CONDITION. THE CONTRACTOR SHALL ARRANGE TO CARRYOUT THE REQUIRED FABRICATION, DRESSING, GRINDING, CLEANING, CUTTING, EDGE PREPARATION, SERVICING / REVISIONING ETC., WHILE CARRYING OUT ERECTION. NO EXTRA CLAIM ON THIS ACCOUNT WILL BE ENTERTAINED.

4.1.23
ACTUATORS / DRIVES OF VALVES, GATES, ETC MAY HAVE TO BE SERVICED, LUBRICATED, BEFORE ERECTION, DURING PRE-COMMISSIONING & COMMISSIONING, INCLUDING CARRYING OUT MINOR ADJUSTMENTS REQUIRED AS INCIDENTAL TO THE WORK.

4.1.24
ALL ELECTRICAL MOTORS HAVE TO BE TESTED FOR IR & PI VALUES, DC RESISTANCE OF WINDING 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. BHEL SHALL PROVIDE THE MOTORIZED MEGGAR FOR THIS PURPOSE.

4.1.25
CONTRACTOR SHALL ARRANGE, EXCEPTING THOSE PROVIDED BY BHEL, SUITABLE CAPACITY EQUIPMENTS SUCH AS FILL PUMPS, PRESSURIZING PUMPS ETC WITH DRIVE MOTORS, STARTERS, CABLES & SWITCHES ETC FOR WATER FILLING, PRESSURE TESTING ETC.

4.1.26
ALL THE HEAT AFFECTED ZONE CREATED DURING FABRICATION AND WELDING HAVE TO BE PAINTED WITH RED OXIDE PRIMER MEETING CUSTOMER SPECIFICATION AFTER DUE COOLING AND CLEANING OF THE AREA. ALL PRIMER, CONSUMABLE ETC ARE IN CONTRACTOR'S SCOPE.

4.1.27
FOR ANY CLASS OF WORK FOR WHICH NO SPECIFICATIONS HAVE BEEN LAID DOWN IN THESE SPECIFICATIONS, WORK SHALL BE EXECUTED AS PER THE INSTRUCTIONS OF BHEL.

4.1.28
THE HRSG AND PIPING SHALL BE ERECTED AS PER RELEVANT PROVISIONS OF INDIAN BOILER REGULATIONS & LATEST AMENDMENTS/REVISIONS THEREOF.

4.1.29

THE SCHEDULE OF TENTATIVE WEIGHTS, ETC. IS MADE AVAILABLE IN THE APPENDIX – I FOR PROVIDING A GENERAL IDEA TO THE TENDERER ABOUT THE MAGNITUDE OF THE WORK INVOLVED HOWEVER, THE WORK SHALL BE EXECUTED AS PER THE DOCUMENTS/ DRGS ETC PROVIDED DURING THE COURSE OF WORK AT SITE.

4.2 PREPARATION OF FOUNDATIONS, AND GROUTING OF EQUIPMENTS

4.2.1
BUILDINGS, FOUNDATIONS AND OTHER NECESSARY CIVIL WORKS FOR SUPPORTING STRUCTURES, EQUIPMENTS ETC, WILL BE PROVIDED BY BHEL. THE CHECKING OF DIMENSIONAL ACCURACY, AXES, ELEVATION, LEVELS ETC, WITH REFERENCE TO BENCH MARKS OF FOUNDATIONS AND ANCHOR BOLT PITS AND ALSO ADJUSTMENTS OF FOUNDATION LEVEL, DRESSING AND CHIPPING OF FOUNDATION SURFACES OF ALL EQUIPMENTS CONTRACTOR/BHEL SHALL PREPARE PROTOCOLS BEFORE TAKING OVER THE FOUNDATIONS. DRESSING AND CHIPPING OF FOUNDATIONS UPTO 25MM FOR ACHIEVING PROPER LEVELS WILL BE WITHIN THE SCOPE OF WORK/SPECIFICATION.

4.2.2
ALL MINOR FOUNDATIONS AND ANCHOR POINTS REQUIRED FOR INSTALLING ERECTION EQUIPMENTS LIKE WINCHES, ANCHORS ETC. ARE TO BE CAST BY THE CONTRACTOR.

4.2.3
THE COMPLETE WORK OF SECONDARY GROUTING OF EQUIPMENTS IS INCLUDED IN THE SCOPE OF WORK/SPECIFICATION. CONTRACTOR SHALL ARRANGE ALL MANPOWER, T&P, FORM WORK AND SHUTTERING MATERIALS, ALL GROUTING MATERIALS SUCH AS ORDINARY PORTLAND CEMENT, SAND, STONE CHIPS ETC & QUICK-SETTING-NON-SHRINK-FREE-FLOW SPECIAL GROUT MIX OF REQUIRED SPECIFICATION (LIKE CONBEXTRA-GP-2 OR EQUIVALENT).

4.2.3.1
THE QUICK-SETTING-NON-SHRINK-FREE-FLOW SPECIAL GROUT MIX SHALL BE PURCHASED ONLY FROM THE FOLLOWING BHEL APPROVED VENDORS:

1. M/S FOSROC CHEMICALS (INDIA) PVT LTD;
2. M/S SIKA INDIA PVT LTD;
3. M/S PAGEL CONCRETE TECHNOLOGIES PVT LTD;
4. M/S PIDILITE INDUSTRIES LTD.

IN ORDER TO ENSURE THE QUALITY, THE MAJOR GROUTING OF EQUIPMENTS USING ANY OF ABOVE GROUT MIXES SHALL ESSENTIALLY BE DONE AS PER THE RECOMMENDATIONS OF SUPPLIER WITH REGARD TO GROUT PREPARATION AND USE OF MACHINERY ETC UNDER THE SUPERVISION OF THE RESPECTIVE SUPPLIER. BHEL HAS ARRANGEMENT WITH ABOVE SUPPLIERS FOR SUPERVISION SERVICES AND THE SUPERVISION CHARGES FOR THE SAME WILL BE BORNE BY BHEL. HOWEVER, THE CONTRACTOR SHALL ENSURE READINESS OF EQUIPMENT FOR GROUTING IN ALL RESPECT BEFORE SUCH A SERVICE IS REQUISITIONED AND THE DURATION IS NOT PROLONGED UNDULY. ANY OVERSTAY REQUIRED DUE TO CONTRACTOR SHALL BE CHARGED TO THE CONTRACTOR WITH BHEL'S DEPARTMENTAL CHARGES. CONTRACT SHALL CONSULT BHEL ENGINEER BEFORE DECIDING UPON THE VENDOR FOR THE ABOVE.

4.2.3.2
CLEANING OF THE FOUNDATION SURFACES, POCKET HOLES, ANCHOR BOLT PITS AND DE-WATERING AND MAKING THEM FREE OF OIL, GREASE, SAND AND OTHER FOREIGN MATERIALS BY SODA WASHING, WATER WASHING, COMPRESSED AIR AND OTHER APPROVED METHODS WILL BE WITHIN THE SCOPE OF THIS WORK.

4.2.4
BHEL WILL PROVIDE ONLY SHIMS AND PACKER PLATES (EITHER MACHINED OR PLAIN), WHICH ARE RECEIVED FROM BHEL'S MANUFACTURING PLANTS AND GO AS PERMANENT PART OF THE EQUIPMENT. ADDITIONAL PACKER PLATES AND SHIMS IF REQUIRED WILL HAVE TO BE PREPARED BY THE CONTRACTOR OUT OF STEEL PLATES, STEEL SHEETS TO MEET SITE REQUIREMENTS. NECESSARY STEEL PLATES FOR THIS PURPOSE WILL BE PROVIDED BY BHEL FREE OF COST.

4.2.5
THE CONTRACTOR SHALL CARRY OUT SCRAPPING AND MATCHING OF EMBEDDED PLATES, PERMANENT SPACERS AND ALL THE MATCHING PARTS OF TURBINE, GENERATOR, PUMPS AND OTHER EQUIPMENTS WHEREVER REQUIRED. THE SUPPORT AND SOLE PLATES MATCHING AND CONCRETE SURFACE BEDDING IS ALSO COVERED IN THE SCOPE OF WORK. THE FINE DRESSING OF CONCRETE SHALL BE WITH PRUSSIAN BLUE-MATCH CHECKS.

4.2.6
PACKER PLATES SHALL NOT ONLY BE BLUE MATCHED WITH FOUNDATIONS BUT ALSO INTER-PACKER CONTACT SURFACES, CONTACT SURFACES BETWEEN PACKER AND PEDESTALS, CONTACT SURFACE BETWEEN PACKER AND FOUNDATION FRAME ETC. SHALL ALSO BE BLUE MATCHED AND REQUIRED PERCENTAGE CONTACT SHALL BE ACHIEVED BY CHIPPING AND SCRAPPING AS PER ENGINEER'S INSTRUCTIONS.

4.3) WELDING, HEAT TREATMENT AND NON DESTRUCTIVE EXAMINATION (NDE)

4.3.1 WELDING:

4.3.1.1
THE HRSG AND PIPING SHALL BE ERECTED IN CONFORMITY WITH THE PROVISION OF INDIAN BOILER REGULATIONS AND AS MAY BE DIRECTED AS PER OTHER STANDARD / SPECIFICATIONS / CODES IN PRACTICE. METHOD OF WELDING (VIZ) ARC, TIG OR OTHER METHODS AS INDICATED IN THE ERECTION WELDING SCHEDULE SHALL BE FOLLOWED; BHEL ENGINEER WILL HAVE THE OPTION TO CHANGE THE METHOD TO SUIT SITE CONDITIONS.

4.3.1.2
WELDING AND TACKING OF HIGH PRESSURE JOINTS SHALL BE DONE BY CERTIFIED HIGH PRESSURE WELDERS WHO POSSESS VALID CERTIFICATE OF CHIEF INSPECTOR OF BOILERS OF THE STATE IN WHICH BOILER IS BEING ERECTED. WELDER SHALL ALSO APPEAR IN ADVANCE, BEFORE CHIEF INSPECTOR OF BOILERS OF THE STATE FOR RE-QUALIFICATION TESTS BEFORE EXPIRY OF THE VALIDITY OF THE CERTIFICATE, AS PER THE PROVISIONS OF INDIAN BOILER REGULATIONS AND KEEP THE CERTIFICATE VALID TILL THE COMPLETION OF THE WORK. THE SERVICES OF SUCH WELDERS WHOSE VALIDITY OF CERTIFICATE IS EXPIRED SHOULD NOT BE ENGAGED ON THE WORKS.

4.3.1.3
IN THE CASE OF P-91 PIPE WELDING, CONTRACTOR SHALL DEPLOY WELDERS HAVING EXPERIENCE IN WELDING OF P-91 MATERIAL. BHEL, AT ITS DISCRETION, MAY EXTEND HELP IN TRAINING OF CONTRACTOR'S WELDERS, NOT QUALIFIED FOR P-91 WELDING, AT BHEL WELDING RESEARCH INSTITUTE (WRI) TRICHY. SUCH WELDERS WOULD BE ALLOWED TO WORK ONLY AFTER PASSING THE REQUIRED QUALIFYING TEST AND ACCEPTANCE BY ALL CONCERNED. ALL EXPENDITURES TOWARDS SUCH QUALIFICATION INCLUDING COST OF TRAINING, TRAVELING EXPENSES, STAY ETC SHALL BE BORNE BY THE CONTRACTOR.

4.3.1.4
ALL WELDERS SHALL BE TESTED AND APPROVED BY BHEL ENGINEER/CUSTOMER BEFORE THEY ARE ACTUALLY ENGAGED ON WORK THOUGH THEY MAY POSSESS THE REQUISITE EXPERIENCE CERTIFICATE. BHEL RESERVES THE RIGHT TO REJECT ANY WELDER WITHOUT ASSIGNING ANY REASONS.

4.3.1.5
ALL EXPENSES FOR WELDERS QUALIFICATION TESTING OF CONTRACTOR'S WELDERS INCLUDING DESTRUCTIVE AND NON-DESTRUCTIVE TESTS CONDUCTED BY BHEL AT SITE SHALL HAVE TO BE BORNE BY THE CONTRACTOR. BHEL WILL PROVIDE THE RAW PIPES AND PLATES FOR PREPARATION OF TEST COUPONS FREE OF CHARGES.

4.3.1.6
BHEL ENGINEER IS ENTITLED TO STOP ANY WELDER FROM HIS WORK IF HIS WORK IS UNSATISFACTORY FOR ANY TECHNICAL REASON OR IF THERE IS A HIGH PERCENTAGE OF REJECTION OF JOINTS WELDED BY HIM, WHICH IN THE OPINION OF BHEL ENGINEERS, WILL ADVERSELY AFFECT THE QUALITY OF WELDING THOUGH THE WELDER HAS EARLIER PASSED THE TESTS PRESCRIBED. THE FACTS THAT THE WELDERS HAVE PASSED THE TEST, DOES NOT RELIEVE THE CONTRACTOR FROM HIS CONTRACTUAL OBLIGATIONS TO CHECK THE PERFORMANCE OF THE WELDERS. CONTRACTOR SHALL SUBMIT A MONTHLY PERFORMANCE RECORD OF ALL WELDERS.

4.3.1.7
ALL WELDED JOINTS SHALL BE SUBJECT TO ACCEPTANCE BY BHEL ENGINEER WHOSE DECISION WILL BE FINAL AND BINDING.

4.3.1.8
THE HIGH PRESSURE WELDERS WHO POSSESS NECESSARY CERTIFICATE SHALL APPEAR WELL IN ADVANCE BEFORE EXPIRY OF THE VALIDITY OF HIS CERTIFICATE FOR RE-QUALIFICATION TEST AS PER RELEVANT PROVISION OF IBR AND KEEP THE CERTIFICATE VALID TILL THE COMPLETION OF WORK. THE SERVICES OF SUCH WELDERS, THE VALIDITY OF WHOSE CERTIFICATES HAVE EXPIRED SHALL HAVE TO BE TERMINATED FORTHWITH.

4.3.1.9
FOR PROTECTION OF ALL PIPE JOINTS AGAINST RUSTING BETWEEN THE FIT UP AND ACTUAL TIME OF WELDING, SUPPLY AND APPLICATION OF SPECIAL DE-OXIDISED WELDABLE ALUMINIUM PAINTING AS APPROVED BY SITE ENGINEER SHALL BE DONE AS PART OF WORK. PROVIDING SUCH PRESERVATIVE IS CONTRACTOR'S RESPONSIBILITY.

4.3.1.10
WELDING ELECTRODES HAVE TO BE STORED IN ENCLOSURES HAVING TEMPERATURE AND HUMIDITY CONTROL ARRANGEMENT. THIS ENCLOSURE SHALL MEET BHEL SPECIFICATIONS.

4.3.1.11
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 DURING SHIFING FROM BACKING AND HOLDING OVEN. CONTRACTOR HAS TO MAKE SUFFICIENT NUMBER OF BACKING OVENS TO MEET THE REQUIREMENT.

4.3.2 HEAT TREATMENT:

4.3.2.1
PRE-HEATING, POST HEATING AND STRESS RELIEVING ARE PART OF ERECTION WORK AND SHALL BE PERFORMED BY THE CONTRACTOR IN ACCORDANCE WITH INSTRUCTIONS OF BHEL ENGINEER. DURING PREHEAT AND STRESS RELIEVING OPERATIONS THE TEMPERATURE SHALL BE MEASURED AS PER THE INSTRUCTIONS OF BHEL ENGINEERS BY THERMOCOUPLES AND RECORDED GRAPHS FOR THE HEAT TREATMENT WORKS CARRIED OUT SHALL BE THE PROPERTY OF BHEL. THE CONTRACTOR HAS TO PROVIDE THERMO-CHALKS FOR CHECKING PREHEAT TEMPERATURE FOR WELDING OR FOR MONITORING TEMPERATURE OF METAL FOR HOT CORRECTION AS PER BHEL ENGINEER'S INSTRUCTIONS.

4.3.2.2
FOR THE PURPOSE OF STRESS RELIEVING, THERMOCOUPLES HAVE TO BE ATTACHED TO THE WELD JOINT. THE NUMBER OF TEMPERATURE MEASURING POINTS AND LOCATIONS SHALL BE AS PER THE STANDARDS OF BHEL. THERMOCOUPLES HAVE TO BE ATTACHED USING CAPACITOR DISCHARGE TYPE PORTABLE THERMOCOUPLE ATTACHMENT UNIT AND NOT BY MANUAL ARC WELDING. CONTRACTOR SHALL ARRANGE SUFFICIENT NUMBER OF THERMOCOUPLE ATTACHMENT UNITS.

4.3.2.3
WHEREVER NECESSARY, CONTRACTOR SHOULD PROVIDE TEMPERATURE INDICATOR / TEMPERATURE RECORDER AS REQUIRED BY BHEL ENGINEER FOR MEASURING HEAT TREATMENT TEMPERATURE FOR WELDING OR FOR CONTROLLING TEMPERATURE OF METAL FOR HOT CORRECTION ETC. THE TEMPERATURE RECORDERS SHOULD BE PREFERABLE OF SOLID STATE TYPE. DECISION OF BHEL ENGINEER ON METHOD AND OF CHECKING PREHEAT TEMPERATURE OF CONTROLLING TEMPERATURE FOR HOT CORRECTION AND WELDING SHALL BE FINAL AND BINDING ON CONTRACTOR.

4.3.2.4
HEAT TREATMENT MAY BE REQUIRED TO BE CARRIED OUT AT ANY TIME (DAY OR NIGHT) TO ENSURE THE CONTINUITY OF THE PROCESS. THE CONTRACTOR SHALL MAKE ALL NECESSARY ARRANGEMENTS INCLUDING LABOURER REQUIRED FOR THE SAME AS PER DIRECTIONS OF BHEL.

4.3.2.5
WHEREVER HEAT TREATMENT / STRESS RELIEVING IS NOT MENTIONED, BUT PRE-HEATING IS REQUIRED ON JOINTS, THE SAME SHALL BE CARRIED OUT AS PART OF THE WORK.

4.3.2.6
FOR WELD JOINTS OF HEAVY STRUCTURAL SECTIONS, IF HEAT TREATMENT IS REQUIRED, THE SAME SHALL BE CARRIED OUT AS PART OF THE WORK.

4.3.2.7
CHECKING EFFECTIVENESS OF STRESS RELIEVING BY HARDNESS TESTS (BY DIGITAL HARDNESS TESTER OR OTHER APPROVED TEST METHODS AS PER BHEL ENGINEER'S INSTRUCTION) INCLUDING NECESSARY TESTING EQUIPMENTS IS WITHIN THE SCOPE OF THE WORK / SPECIFICATION.

4.3.2.8
PREHEATING, INTER-PASS HEATING, POST WELD HEATING AND STRESS RELIEVING AFTER WELDING ARE PART OF ERECTION WORK AND SHALL BE PERFORMED BY THE CONTRACTOR IN ACCORDANCE WITH BHEL ENGINEER'S INSTRUCTIONS. WHERE THE ELECTRIC RESISTANCE HEATING METHOD IS ADOPTED CONTRACTOR SHALL MAKE ALL ARRANGEMENT INCLUDING 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.

BHEL WILL PROVIDE THE INDUCTION HEATING EQUIPMENT SET FOR SA 335 P 91 OR EQUIVALENT MATERIALS PIPING, VALVE, FITTINGS & SPECIALITIES ONLY. THE SET WILL COMPRISE OF FOLLOWING:

I. MAIN PANEL
II. CAPACITOR PANEL
II. INTERCONNECTION POWER & CONTROL CABLES BETWEEN ABOVE PANELS
IV. 185 SQ MM SPECIAL CONNECTING CABLE FROM CAPACITOR PANEL OUTPUT – 5M LENGTH.

CONTRACTOR SHALL PROVIDE THE INPUT ELECTRICAL POWER CONNECTION INCLUDING ARRANGEMENTS SUCH AS DB, CABLES ETC, THERMOCOUPLE PADS, THERMOCOUPLES AND COMPENSATING CABLES, INDUCTION HEATING ANNEALING CABLES (FROM THE CAPACITOR PANEL TO JOINT AND FOR WRAPPING AROUND THE WELD JOINT) (SPEC: SINGLE CORE 240 SQ MM, 1200A, 3KHZ), CERAMIC WOOL AND OTHER CONSUMABLES ETC AS MAY BE REQUIRED. QUANTUM OF ANNEALING CABLE REQUIREMENT WILL DEPEND ON MANY PARAMETERS E.G. WELD JOINT SIZE, HEAT INPUT, TYPE OF CONNECTION I.E. SERIES OR PARALLEL ETC.
LIKELY SUPPLIER: MANSFIELD CABLE CO, NOIDA (UP).

4.3.2.8
ALL THE RECORDED GRAPHS FOR HEAT TREATMENT SHALL BE HANDED OVER TO BHEL/ IBR AUTHORITIES AND DUE CLEARANCES OBTAINED.

4.3.2.9
DURING WELDING & POST WELD HEAT TREATMENT OF MAIN STEAM PIPING (P-91 MATERIAL), THE INDUCTION HEATING PROCESS SHALL CONTINUE UN-INTERRUPTED. THEREFORE, CONTACTOR SHALL ARRANGE DG SET FOR THE SAME TO TAKE CARE OF POWER FAILURES.

4.3.2.10
RESULTS OF THESE PROCESSES SHALL BE VERIFIED/ VALIDATED AS PER REQUIREMENTS OF BHEL/CLIENT.

4.3.3 NON DESTRUCTIVE EXAMINATION:

4.3.3.1
RADIOGRAPHIC INSPECTION OF WELDS SHALL BE ARRANGED BY THE CONTRACTOR INCLUDING ALL CONSUMABLES LIKE ISOTOPE CAMERA, FILM, CHEMICALS ETC. SCAFFOLDING AND APPROACHES FOR TAKING RADIOGRAPHS. THE NECESSARY SKILLED TECHNICIAN AND LABOURERS FOR TAKING THE RADIOGRAPHS SHALL BE PROVIDED BY THE CONTRACTOR. WHILE TAKING RADIOGRAPHS, THE CONTRACTOR HAS TO USE PROPER PENETRAMETER / IMAGE QUALITY INDICATORS AS INSTRUCTED BY THE BHEL ENGINEER. ALL THE PROCESSED AND ACCEPTED FILMS WILL BE THE PROPERTY OF BHEL. IN THIS REGARD, THE CONTRACTOR HAS TO ADHERE TO THE SAFETY RULES / REGULATIONS LAID BY BARC AUTHORITIES FROM TIME TO TIME. IT MAY PLEASE BE NOTED THAT INVARIABLY THE RADIOGRAPHIC WORK WILL BE CARRIED AFTER THE NORMAL WORKING HOURS.

4.3.3.2
TENDERER SHALL NOTE THAT 100% RADIOGRAPHY SHALL BE TAKEN ON ALL HIGH PRESSURE WELDING TILL SUCH TIME THE WELDERS' PERFORMANCE IS FOUND BY BHEL ENGINEERS TO BE SATISFACTORY. SUBSEQUENTLY, SUBJECT TO CONSISTENCY IN WELDER'S PERFORMANCE, THE PERCENTAGE OF RADIOGRAPHY

WILL BE BASED ON BHEL'S STANDARD PRACTICE/CODE REQUIREMENT. THE DEFECTS SHALL BE RECTIFIED IMMEDIATELY AND TO THE SATISFACTION OF BHEL ENGINEER. THE DECISION OF BHEL ENGINEER REGARDING ACCEPTANCE / REJECTING THE JOINTS WILL BE FINAL AND BINDING ON THE CONTRACTOR.

4.3.3.3
WHEREVER RADIOGRAPHS ARE NOT ACCEPTED, ON ACCOUNT OF BAD SHOT, JOINTS SHALL BE RE-RADIOGRAPHED AND RE-SHOTS SUBMITTED FOR EVALUATION. RADIOGRAPHS SHALL BE TAKEN ON JOINTS AFTER CARRYING OUT REPAIRS. HOWEVER, IF DEFECT PERSISTS AFTER FIRST REPAIR, AS PER RADIOGRAPH, CARRYING OUT REPAIRS AND RADIOGRAPHY SHALL BE REPEATED TILL JOINT IS MADE ACCEPTABLE. IN CASE, THE JOINT IS NOT REPAIRABLE, THE SAME SHALL HAVE TO BE CUT AND REPAIRED AT CONTRACTOR'S COST. DECISION OF BHEL ENGINEER IN ALL THESE MATTERS IS FINAL AND BINDING ON THE CONTRACTOR. PAYMENT IS CONSIDERED ONLY FOR RADIOGRAPHY AFTER CLEARING ALL DEFECTS.

4.3.3.4
100% RADIOGRAPH OF CERTAIN SIZES IN PIPING HAVE TO BE TAKEN AS PER BHEL STANDARDS/ DRAWINGS.

4.3.3.5
ALL FIELD-WELDED JOINTS SHALL BE SUBJECTED TO DYE-PENETRANT EXAMINATION AS SPECIFIED IN RESPECTIVE DRAWINGS AND SHALL HAVE TO BE ACCEPTED BY BHEL ENGINEER. ANY RECTIFICATION REQUIRED SHALL HAVE TO BE DONE BY THE CONTRACTOR AT HIS COST.

4.3.3.6
FOR CARRYING OUT ULTRASONIC TESTING OF WELDING JOINTS, LARGE SIZE TUBES AND PIPES, IT WILL BE NECESSARY TO PREPARE SURFACE BY GRINDING AND BUFFING A SMOOTH FINISH AND CONTOUR AS NECESSARY. THE CONTRACTOR'S SCOPE OF WORK INCLUDES SUCH PREPARATION AND NO EXTRA CHARGE IS PAYABLE FOR THIS.

4.3.3.7
IT MAY ALSO BECOME NECESSARY TO ADOPT INTER LAYER RADIOGRAPHY/MPT/UT AND FINAL NDE COMBINING 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.

4.3.3.8
ALL THE WELDED JOINTS OF STEAM ADMISSION PIPELINES TO HPT, IPT AND LPT SHALL HAVE TO BE SUBJECTED TO NON-DESTRUCTIVE TESTS VIZ. MAGNETIC PARTICLE TEST, DYE PENETRATION TEST AND HARDNESS TEST IN ADDITION TO RADIOGRAPHY AND ULTRASONIC TESTING. ALL THE WELD SEAMS SHALL BE PROPERLY GROUND AND SUBJECTED TO 100% RADIOGRAPHIC EXAMINATION.

4.3.3.9
CONTRACTOR MAY HAVE TO UNDERTAKE RADIOGRAPHY WITH COBALT-60 ISOTOPE CAMERA. IN CASE DUE TO UNAVOIDABLE CIRCUMSTANCES COBALT-60 IS NOT POSSIBLE TO BE USED, THOSE JOINTS SHALL BE CHECKED BY 'ULTRASONIC TEST'. AFTER COMPLETION OF SUITABLE PART OF THE THICKNESS, RADIOGRAPHY WITH IR–192/COBALT 60 OR OTHER SUITABLE SOURCE AS ACCEPTABLE TO BARC TO BE DONE IN CASE COBALT-60 SOURCE CANNOT BE USED, SUBSEQUENTLY AFTER COMPLETING THE JOINT UT TO BE DONE. CONTRACTOR SHALL DEPLOY LEVEL–II OPERATOR CERTIFIED BY BARC FOR THIS PURPOSE.

4.3.3.10
IN THE CASE OF P-91 PIPING NDT REQUIREMENT, SINCE NO RADIOGRAPHY IS POSSIBLE, ALTERNATIVELY ULTRASONIC TEST HAS TO BE CARRIED OUT APART FROM OTHER NDE.

4.3.3.11
FOR PIPING OF THICKNESS LESS THAN 25 MM NO RADIOGRAPHY PLUGS WILL BE PROVIDED. RADIOGRAPHY SHOTS TO BE TAKEN BY DOUBLE WALL TECHNIQUE OR ANY OTHER METHOD TO BE ADOPTED IN CONSULTATION WITH BHEL ENGINEER AT SITE.

4.3.3.12
NO SEPARATE PAYMENT FOR ANY NDE ACTIVITIES IS ENVISAGED. THE QUOTED PRICE SHALL INCLUDE ALL THE NDE ACTIVITIES.

4.4 ERECTION OF HRSG, ITS AUXILIARIES

4.4.1 HRSG

4.4.1.1 RECEIPT, UNLOADING, STACKING AND ERECTION OF MODULES:

4.4.1.1 ERECTION OF HEAT TRANSFER MODULES:

THE HEAT TRANSFER MODULES WILL BE SENT LOOSE, 2-3 NOS WITH INTERMEDIATE WOODEN PACKING, IN LIGHT CRATING-CUM-ARRESTOR ARRANGEMENT WELDED TO THE TRAILER BED. THE CRATE-ARRESTOR HAS TO BE CUT AT SITE FOR UNLOADING THE MODULES ONE-BY-ONE. FOR UNLOADING THE MODULES SPECIAL UNLOADING FRAMES HAVE TO BE USED AS THE MODULES BEING FLEXIBLE HAVE PROPENSITY TO BENDING. UTMOST CARE IS, THEREFORE, ESSENTIAL WHILE UNLOADING THE MODULES AND A SPECIAL FRAME WILL HAVE TO BE USED FOR UNLOADING SUPPLIED BY BHEL, MU.

THESE MODULES WILL BE UNLOADED DIRECTLY AT SITE AND ONLY 2-3 MODULES, WITH WOODEN PACKING BETWEEN THEM AT APPROPRIATE LOCATIONS, SHALL BE KEPT IN EACH STACK.

FOR ERECTION OF THESE MODULES YET ANOTHER FRAME, FOR MAKING THE MODULE VERTICAL, WILL BE REQUIRED. FRAME WILL BE PROVIDED BY BHEL MU.

IN ALL THESE HANDLING OF MODULES POLYESTER FLAT WEBBING SLING MAY HAVE TO BE USED. CONTRACTOR SHALL PROVIDE THE SAME.

THERE ARE 327 MODULES OF BOTH CARBON STEEL AND ALLOY STEEL PUT TOGETHER. THE APPROXIMATE DIMENSION OF EACH MODULE IS 4MX23 M MAX, AND EACH MODULE WEIGHS 10 MT APPROX.

4.4.1.2 ERECTION OF BOILER DRUMS:

THERE ARE TOTAL 3 BOILER DRUMS ONE EACH FOR HP, IP AND LP CIRCUIT. THE TENTATVE WEIGHT AND DIMENSIONS RESPECTIVELY ARE AS UNDER:

HP DRUM - 1 NO- WEIGHT - 156 TONS, LENGTH- 19.2 M, HEIGHT 3.1 M
IP DRUM - 1 NO- WEIGHT - 41 TONS , LENGTH- 16.45 M, HEIGHT 2.45M
LP DRUM - 1 NO - WEIGHT - 22 TONS , LENGTH 16.45 M , HEIGHT 2.45 M

THESE HAVE TO BE ERECTED WITH THE HELP OF ADEQUATE CAPACITY CRANE FROM THE SIDE OF HRSG AFTER THE ERECTION OF CASING AND HEAT TRANSFER MODULES OF RESPECTIVE CIRCUITS.

4.4.1.3
IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE TEMPORARY LADDERS ON COLUMNS, CHIMNEY ETC IN A MANNER PRESCRIBED BY BHEL USING THEIR OWN MATERIAL TILL SUCH TIME AS PERMANENT STAIRWAYS ARE COMPLETED.

4.4.1.4
PRESSURE PARTS COMPONENTS LIKE HEADERS, MODULES, LOOSE TUBES ETC. HAVE TO BE CHECKED FOR DIMENSIONAL ACCURACY AND CONFIGURATION AND MINOR RECTIFICATIONS, IF NECESSARY WILL HAVE TO BE DONE BEFORE ERECTION. THIS WILL INVOLVE MAKING APPROPRIATE BED OF STEEL STRUCTURES OVER THE CONCRETE BLOCKS. STEEL, IN RANDOM SIZES, FOR THIS PURPOSE WILL BE PROVIDED BY BHEL FROM THE PACKING MATERIALS / SCRAPS ETC., WHERE AS NECESSARY CONCRETE BLOCKS SHALL BE ARRANGED BY THE CONTRACTOR. BED SHALL BE FABRICATED AS PER REQUIREMENT. THESE SHALL BE DISMANTLED & RETURNED TO BHEL AT APPROPRIATE STAGE. NO SEPARATE PAYMENT FOR MAKING / DISMANTLING SUCH BED IS ENVISAGED.

4.4.1.5
NORMALLY THE HIGH PRESSURE VALVES WILL HAVE PREPARED EDGES FOR WELDING. BUT, IF IT BECOMES NECESSARY, THE CONTRACTOR SHALL PREPARE NEW EDGES OR RECONDITION THE EDGES BY GRINDING OR CHAMFERING TO MATCH THE CORRESPONDING TUBES AND PIPES. ALL FITTINGS LIKE “T” PIECES, WELD NECK FLANGES, REDUCERS, ETC., SHALL BE SUITABLY MATCHED WITH PIPES FOR WELDING (THIS IS APPLICABLE TO PIPING WORK ALSO).

4.4.1.6
TUBES OR PIPES WHEREVER DEEMED CONVENIENT, WILL BE SENT IN RANDOM LENGTHS. TUBES / PIPES SENT IN STANDARD/ RANDOM LENGTH SHALL BE CUT AND EDGE PREPARED TO SUIT THE SITE CONDITIONS AND THE LAYOUTS. BENDS OF TUBES UPTO OD 65 MM WILL HAVE TO BE FORMED AT SITE AS INCIDENTAL TO THE WORK. THIS IS APPLICABLE TO PIPING WORK ALSO.

4.4.1.7
WELDING OF ALL ATTACHMENTS, INCLUDING THOSE OF STAINLESS STEEL HOOKS/ PINS ON CASING & INLET DUCT, NON-PRESSURE PARTS, PRESSURE PARTS/ PIPING INCLUDING THOSE REQUIRED FOR INSULATION WORK OF HRSG WITH AUX, STEEL STACK AND EQUIPMENTS, TANKS / VESSELS, HEATERS, DEAERATOR ETC. OF STEAM TURBINE & GAS TURBINE SET, PIPINGS IS IN THE SCOPE OF WORK.

4.4.1.8
FURNACE AREA AND HEAT RECOVERY AREA OF FLUE GAS PASSAGE HAS TO BE MADE LEAK PROOF BY SEAL WELDING. AIR LEAK TEST BY PRESSURIZATION HAS TO BE CONDUCTED TO PROVE EFFECTIVENESS OF THE SEAL WELD AND BUBBLE/ SOAP TEST WILL HAVE TO BE CARRIED OUT FOR THE ENTIRE SEAL WELDS TO ASCERTAIN THE EFFECTIVE SEALING IS ACHIEVED. THE TESTS MAY HAVE TO BE REPEATED TILL SATISFACTORY RESULT ACHIEVED.

4.4.1.9
IF REQUIRED, THE PRESSURE PARTS, AFTER INITIAL ERECTION AND TESTS, WILL HAVE TO BE PRESERVED BY EITHER DRY OR WET PRESERVATION PROCEDURE. CONTRACTOR SHALL RENDER ALL ASSISTANCE FOR THIS AND ERECT TEMPERORY PIPING WITH VALVES WHEREVER NECESSARY. REQUIRED MATERIAL WILL BE PROVIDED BY BHEL.

4.4.1.10
THE DRUM INTERNALS, IF ALREADY INSTALLED, MAY HAVE TO BE REMOVED TO FACILITATE TUBE EXPANSION, INSPECTION BY STATUTORY AUTHORITIES AND CHEMICAL CLEANING. THE DRUM INTERNALS ARE TO BE PRESERVED PROPERLY AND REFITTED AFTERWARDS AS PART OF WORK.

4.4.2 PIPING (POWER CYCLE PIPING, INTEGRAL PIPING, REGENERATIVE PIPING INCLUDING INSTRUMENT AIR & SERVICE AIR PIPING ETC.)

4.4.2.1
THE WORK ON VARIOUS PIPING SYSTEMS WILL INCLUDE CUTTING TO REQUIRED LENGTH, EDGE PREPARATION, LAYING, FIXING & WELDING OF THE PIPES / ELBOWS / FITTINGS/ VALVES ETC. IN THE PIPELINE, FIXING & ADJUSTMENT OF SUPPORTS / ANCHORS / SHOCK ABSORBERS AND CARRYING OUT ALL OTHER ACTIVITIES / WORK TO COMPLETE THE ERECTION AND ALSO CARRYING OUT ALL PRE-COMMISSIONING / COMMISSIONING OPERATIONS MENTIONED IN THE SPECIFICATION AS PER BHEL ENGINEERS INSTRUCTIONS AND / OR AS PER APPROVED DRAWINGS / DOCUMENTS.

4.4.2.2
LAYING OF PIPELINES AS PER THE SPECIFICATIONS, BETWEEN EQUIPMENTS CONSTITUTING TERMINAL POINT, WHETHER THE TERMINAL EQUIPMENTS FALL WITHIN THE SCOPE OF THE WORK / SPECIFICATION OR NOT, IS WITHIN THE SCOPE OF THE WORK / SPECIFICATION. THE CONTRACTOR SHALL COMPLETE TERMINAL JOINTS AT BOTH ENDS FOR ALL THE PIPING SCHEMES COVERED IN THE SPECIFICATION.

4.4.2.3
ALIGNING, MATCHING AND WELDING OF PIPING TO THE TERMINAL POINTS (SUCH AS STUBS, ON TERMINAL EQUIPMENTS, STUBS ON HEADERS, BATTERY LIMITS ETC), EVEN IF THESE TERMINAL EQUIPMENT/POINT DO NOT FORM PART OF THIS SCOPE OF WORK / SPECIFICATION, AND STRESS RELIEVING AND NDE OF JOINTS SO MADE IS ALSO WITHIN THE SCOPE OF WORK / SPECIFICATION. ALSO, WHERE THE PIPING CONNECTION TO THE TERMINAL POINTS INVOLVES FLANGED JOINTS, MOUNTING AND WELDING OF FLANGES ON PIPING AS WELL AS TERMINAL EQUIPMENT MATCHING OF FLANGES AS SPECIFIED ELSEWHERE HEREIN, FIXING OF GASKETS, BOLTING AND TIGHTENING AS PER BHEL ENGINEER'S INSTRUCTION IS ALSO IN THIS SCOPE OF WORK / SPECIFICATIONS. REQUIRED FASTENERS AND GASKETS WILL BE SUPPLIED BY BHEL FREE OF COST.

4.4.2.4
FOLLOWING ITEMS OF WORK SHALL ALSO FORM PART OF PIPING ERECTION:

1.
INSTALLATION & REMOVAL, AS APPLICABLE, OF ISOLATING DEVICES/ NRVS AND REMOVAL & RE-FIXING OF INTERNALS REQUIRED FOR HYDRAULIC TESTING, PRE-COMMISSIONING AND COMMISSIONING ACTIVITIES. REQUIRED GASKETS WILL BE SUPPLIED BY BHEL FREE OF COST.

2.
MATCHING OF FLANGES FOR ACHIEVING PARALLELISM AND ALIGNMENT RESORTING TO HEAT CORRECTION OR OTHER SUITABLE METHODS AS PER INSTRUCTIONS OF BHEL ENGINEERS.

3.
TO LOCATE THE CAUSE OF VIBRATIONS IN PUMPS OR OTHER AUXILIARIES AND TO CARRY OUT NECESSARY CORRECTIONS IN PIPING AND ITS SUPPORTS. THIS MAY INVOLVE CUTTING, FRESH EDGE PREPARATION, WELDING, RADIOGRAPHY, STRESS RELIEVING, ETC., OF SUCTION, DISCHARGE, RE-CIRCULATING AND OTHER CONNECTED PIPING AND ITS SUPPORTS AT NUMBER OF PLACES.

4.
INCREASE OR DECREASE IN LENGTH OF PIPING INCLUDING CHANGE IN LAYOUT TO SUIT SITE CONDITIONS.

5.
FABRICATION AND ERECTION OF RACKS AND STEEL SUPPORTS FOR ALL THE PIPING INCLUDING OF SYSTEM PIPING. STEEL FOR THIS PURPOSE WILL BE SUPPLIED BY BHEL IN RANDOM SIZES.

6.
ERECTION, WELDING, NDE AND STRESS RELIEVING OF CERTAIN EQUIPMENTS, E.G. FLOW NOZZLES, CONTROL VALVES ETC, AFTER COMPLETION OF CERTAIN ACTIVITIES E.G. CHEMICAL CLEANING, STEAM BLOWING ETC IS PART OF WORK. THIS MAY INVOLVE REMOVAL OF PORTIONS FROM THE ALREADY ERECTED PIPELINES IN ORDER TO INTRODUCE THESE EQUIPMENTS AND RESULTANT EDGE PREPARATION ETC SHALL BE INCIDENTAL TO WORK. NO SEPARATE/ ADDITIONAL PAYMENT IS ENVISAGED FOR CUTTING, WELDING AND EDGE PREPARATION IN THIS REGARD. THE REMOVED PIECES OF PIPES SHALL BE RETURNED TO BHEL STORES WITH PROPER CLEANING, DRESSING AND IDENTIFICATION MARKING.

7.
MATCHING OF ALL FITTINGS LIKE TEES, BENDS, FLANGES, REDUCERS, VALVES, SOCKET FITTINGS, ETC WITH PIPES FOR WELDING. THIS MAY INVOLVE WELD BUILD UP, EDGE PREPARATION, ETC.

8.
CLEANING OF ALL PIPES AS PRESCRIBED, FLUSHING BY COMPRESSED AIR ETC.

9.
WELDING OF ROOT VALVES WITH SMALL LENGTH OF PIPING TO THE PRESSURE, FLOW AND LEVEL TAPPING POINTS ON PIPING OR FLOW NOZZLES / ORIFICES / METERING ELEMENTS FIXED ON PIPING.

10.
WELDING OF WELD BLANKS WITH DUE NDE & PWHT, IF REQUIRED, ON A TEMPORARY BASIS.

11.
OPENING OF VALVE ACTUATORS, DISMANTLING OF ACTUATORS FROM THE VALVES, REFITTING AND RENDERING ASSISTANCE CONNECTED WITH THE ELECTRICAL AND MECHANICAL PROBLEMS.

12.
FIXING AND WELDING INCLUDING DUE NDE & PWHT ETC OF CARRIER PLATES ON TO THE PIPES.

4.4.2.5
ON ALL STEAM PIPING, WATER PIPING, OIL PIPING, AIR PIPING, ETC, WHERE BUTT WELDING IS INVOLVED, ROOT TIG WELDING AND SUBSEQUENT ARC WELDING SHALL BE ADOPTED AS INSTRUCTED BY BHEL ENGINEER. THE DECISION OF BHEL ENGINEER REGARDING WELDING PROCEDURE FOR WELDING OF ABOVE LINES WILL BE BINDING ON THE CONTRACTOR.

4.4.2.6
PIPES / TUBES / STRUCTURAL MATERIALS, WHICH ARE ISSUED IN RUNNING METERS, MAY NOT BE SENT IN STANDARD LENGTHS. THESE HAVE TO BE CUT TO SUIT SITE CONDITIONS.

4.4.2.7
CERTAIN PIPE LINES OF OIL, AIR, STEAM AND WATER WILL BE FIELD ROUTED AS PER SCHEMES APPROVED AT SITE OR AS PER THE INSTRUCTIONS OF BHEL ENGINEER, AND WILL BE SUPPLIED IN RANDOM LENGTHS / RUNNING LENGTHS. THE CONTRACTOR SHALL LAY THE PIPING ACCORDING TO INSTRUCTIONS AT SITES, AFTER CARRYING OUT THE NECESSARY FABRICATION, EDGE PREPARATION, ROUTING, SUPPORTING ETC, IN BEST PROFESSIONAL MANNER AND AS PER INSTRUCTIONS. THE SUPPORTS FOR FIELD-ROUTED PIPING SHALL BE FABRICATED AND ERECTED AS PER THE REQUIREMENT OF THE WORK. THE STEEL REQUIRED FOR THE SUPPORTS WILL BE PROVIDED BY BHEL FREE OF COST AT THEIR STORES.

4.4.2.9
ALL WELD JOINTS ON PIPING SHALL BE GROUND OR FILED ON COMPLETION OF WELDING AND BEFORE RADIOGRAPHY AS PER INSTRUCTIONS BHEL ENGINEER SO AS TO ACHIEVE SMOOTH SURFACE FREE OF NOTCHES, RIPPLES, UNDULATIONS, ETC. AND TO LIMIT THE REINFORCEMENT AS PER THE CODES.

4.4.2.10
CONTRACTOR SHALL ERECT THE PIPING BY DOING PRE-ASSEMBLE ON GROUND IF POSSIBLE AT THE FIRST INSTANCE. THE PIPE LAYING SHALL BE CARRIED OUT FROM THE AVAILABLE TERMINAL POINT / POINTS OR ANY OTHER AREA BETWEEN THE TERMINAL POINTS. THE ERECTION CAN BE CARRIED OUT ON TEMPORARY SUPPORTS TO OBTAIN PROPER ALIGNMENT AND WELDING. AFTER FIXING THE PERMANENT SUPPORTS, ALL THE TEMPORARY SUPPORTS SHALL BE REMOVED. THE ALIGNMENT, DISTANCES AND LOADING OF THE SUPPORTS SHALL BE CHECKED AND THE REQUIRED SPRING COMPRESSION ACHIEVED IN THE CASE OF SPRING HANGERS.

4.4.2.11
CONTRACTOR SHALL CARRYOUT EDGE PREPARATIONS FOR WELDS JOINTS IN ACCORDANCE WITH BHEL DRAWINGS / BHEL STANDARDS / BHEL ENGINEER'S INSTRUCTION.

4.4.2.12
THE LOCATION OF DRAIN HEADERS, VALVES, STATIONS, STEAM TRAPS OF PIPING AS INDICATED IN THE BHEL DRAWINGS ARE SUGGESTIVE ONLY. THE FINAL LOCATION AND ROUTINGS SHALL BE DECIDED TO SUIT THE SITE CONDITIONS. WHILE ROUTING SUCH LINES AND FIXING THE STATIONS, IT HAS TO BE ERECTED SO AS TO PROVIDE EASY ACCESSIBILITY AND FREE PATH FOR THE PURPOSE OF EASY OPERATION AND MAINTENANCE. THESE LOCATIONS SHALL BE ACCEPTABLE TO THE CLIENT. SOMETIMES, THE LOCATIONS OF STATIONS AND ROUTING OF LINES MAY HAVE TO BE CHANGED AS PER THE SITE CONDITIONS. ALL SUCH WORKS SHALL BE CARRIED OUT EXPEDITIOUSLY AS PER THE INSTRUCTIONS OF BHEL ENGINEER. THE DECISION OF BHEL ENGINEER IS FINAL AND BINDING ON THE CONTRACTOR.

4.4.2.13
THE RATE QUOTED IN RATE SCHEDULE IS ALSO INCLUSIVE OF PRE-HEATING, WELDING, RADIOGRAPHY, POST HEATING, POST WELD HEAT TREATMENT/ STRESS RELIEVING AND NDE.

4.4.2.14
HANGER RODS SHOWN IN THE PIPING ARRANGEMENT DRAWING MAY HAVE TO CUT AND WELDED TO SUIT SITE CONDITION. THE CONTRACTOR SHALL DO CUTTING AND WELDING OF THESE HANGER RODS. THE NDE & STRESS RELIEVING REQUIRED ON WELDED HANGER RODS SHALL BE CARRIED OUT. THE HANGER FOR PIPING WILL BE TESTED FOR EVEN DISTRIBUTION OF LOAD WITH THE HELP OF TORQUE WRENCH.

4.4.2.15
THE PIPING MAY BE PROVIDED WITH HAND HOLES. THE HAND HOLES WILL BE OPENED UP FOR INSPECTION AND SEAL WELDED PRIOR TO OPERATION.

4.4.2.16
STRUCTURAL MATERIALS REQUIRED FOR THE SUPPORTING / OPERATING PLATFORMS REQUIRED FOR THE VALVES/EQUIPMENTS AT VARIOUS LEVELS FOR THE SAFE OPERATION WILL BE ISSUED IN RANDOM SIZES TO THE CONTRACTOR FREE OF COST. HOWEVER, THE CONTRACTOR'S QUOTED RATE SHALL INCLUDE FABRICATION AND ERECTION OF ALL SUCH OF PLATFORMS AT SITE AND NO EXTRA PAYMENTS SHALL BE ALLOWED FOR THIS AND ONLY TONNAGE RATE APPLICABLE FOR STRUCTURES ONLY WILL BE PAYABLE.

4.4.2.17
ERECTION OF PIPING SYSTEMS SHALL BE COORDINATED BY THE CONTRACTOR AS REQUIRED, WITH THE ERECTION OF THE GAS TURBINE, STEAM TURBINE, GT & STG GENERATORS, CONDENSER, BOILER FEED PUMPS AND OTHER MAJOR EQUIPMENTS, APPROVAL MUST BE OBTAINED FROM THE CONCERNED BHEL ENGINEER AND OTHER AGENCIES CONCERNED PRIOR TO MAKING PIPING INTERFACE CONNECTIONS TO THE AFOREMENTIONED EQUIPMENTS. SEQUENCE OF WORK SHALL BE CAREFULLY PLANNED TO MINIMIZE INTERFERENCE WITH OTHER GROUPS WORKING IN THE SAME AREA. ACTUAL SEQUENCE TO BE FOLLOWED SHALL BE SUBJECT TO THE APPROVAL OF ENGINEER AND ENGINEERS MAY, AT TIME, DIRECT THE CONTRACTOR TO RESCHEDULE HIS WORK AS PER STATUS OF THE SITE WORK.

4.4.2.18
WHILE ERECTING THE FIELD RUN PIPES, THE CONTRACTOR SHALL CHECK THE ACCESSIBILITY OF VALVES, INSTRUMENTS TAPPING POINTS AND MAINTAIN MINIMUM HEAD ROOM REQUIREMENT AND OTHER NECESSARY CLEARANCE FROM THE ADJOINING WORK AREAS TO AVOID INTERFERENCES.

4.4.2.19
ALL PIPELINES SHALL BE GIVEN PROPER SLOPE TOWARDS THE DRAIN POINTS DURING ERECTION.

4.4.2.20
ALL PIPE LINES SHALL BE PROVIDED WITH SUITABLE VENT AND THE DRAIN POINTS WITH VALVE (S) ON THE HIGHEST AND LOWER POINTS OF THE PIPE RUN ALTHOUGH MAY NOT BE SPECIFICALLY MENTIONED IN THE DRAWING AS PER THE INSTRUCTIONS OF BHEL ENGINEER.

4.4.2.21
FOR INSTRUMENT CONNECTIONS, PIPE STUBS INCLUDING THE INSTRUMENT TUBING UP TO THE ROOT VALVE(S) SHALL BE INSTALLED BY THE CONTRACTOR. ROOT VALVES SHALL BE LOCATED IN THE CONVENIENT LOCATION / PLACE AS REQUIRED BY THE CUSTOMER TO FACILITATE EASY OPERATION AS PER THE DECISION / INSTRUCTION OF BHEL ENGINEER.

4.4.2.22
THE CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECT ORIENTATION OF ALL VALVES SO THAT FLOW DIRECTION, SEATS, STEM AND HAND WHEEL ARE IN DESIRED LOCATIONS. INFORMATION REGARDING ORIENTATION OF VALVES, NOT FULLY LOCATED ON DRAWINGS, MAY BE OBTAINED FROM THE BHEL ENGINEERS.

4.4.2.23
THE PIPING SYSTEMS, WHICH COME UNDER THE PURVIEW OF IBR, SHOULD MEET THE REQUIREMENT OF IBR. THE CONTRACTOR SHALL BE WELL VERSED WITH ALL THE LATEST AMENDMENTS OF INDIAN BOILER REGULATIONS.

4.4.2.24
ALL PIPING SHALL BE GROUPED WHEREVER PRACTICABLE AND SHALL BE ROUTED TO PRESENT A NEAT APPEARANCE.

4.4.2.25
FOR FIELD RUN PIPING, CONTRACTOR SHALL FABRICATE AND ERECT ALL HANGERS AND SUPPORTS AS REQUIRED WITH DUE REGARD TO GENERAL ARRANGEMENT LAYOUT OF OTHER PIPES, HANGERS, CABLE TRAYS, DUCTING, STRUCTURAL MEMBERS, ETC.

4.4.2.26
FOR MAINTAINING THE SLOPES AS GIVEN IN THE DRAWINGS FOR LARGER THICKNESS AND LARGER DIA PIPELINES, EDGE PREPARATION FOR WELDING MAY HAVE TO BE ALTERED SUITABLY TO ACHIEVE THE SLOPE.

4.4.2.27
IT MAY BECOME NECESSARY TO MAKE & INSTALL TEMPORARY SPOOL PIECES FOR CERTAIN PROCESS REQUIREMENTS. CONTRACTOR'S SCOPE SHALL INCLUDE PREPARATION, ERECTION, FIT-UP, WELDING, NDE ETC AND DISMANTLING OF SUCH SPOOL PIECES AT APPROPRIATE STAGE WITHOUT ANY ADDITIONAL PAYMENT.

4.4.2.28
IN PIPELINES LIKE REHEATER LINES, CRH LINES, EXTRACTION LINES, HP/IP & LP BYPASS LINES ETC., THE NRVS AND VALVES WILL ALSO BE ERECTED BY CONTRACTOR UNDER THIS TENDER SPECIFICATIONS. THOUGH THESE NRVs & VALVES MAY BE SUPPLIED FROM DIFFERENT UNITS / DIFFERENT SOURCES, THE ERECTION, ALIGNMENT, WELDING, NDE TEST, HEAT TREATNENT, RADIOGRAPHY, SUPPORTING ETC. ALONG WITH THEIR CONTROL/ GOVERNING OIL SYSTEM PIPING WITH TANKS, PUMPS, POWER CYLINDERS ETC. INLUDING THE OIL FLUSHNG & COMMISSIONING OF THESE VALVES SHALL BE CARRIED OUT BY CONTRACTOR AS PER INSTRUCTION OF BHEL ENGINEER AND DRAWINGS / DOCUMENTS REQUIREMENT. SIMILARLY ERECTION / FIXING, WELDING ETC. OF STRAINERS, DUMMY DEVICES IN VARIUOS LINES, VALVES AND THEIR SUBSEQUENT REMOVAL & RE-FIXING DURING PRE-COMMISSIONING / COMMISSIONING STAGES OF STEAM BLOWING, FLUSHING ETC. SHALL BE CARRIED OUT BY CONTRACTOR UNDER THESE TENDER SPECIFICATIONS.

4.4.2.29
ALL TEMPORARY LINES REQUIRED FOR CHEMICAL CLEANING, HYDRAULIC TESTING, STEAM BLOWING, ETC., SHALL BE SUPPLIED IN 'AS IS WHERE IS' CONDITION. THE CONTRACTOR SHALL ARRANGE TO CARRYOUT THE REQUIRED FABRICATION, DRESSING, GRINDING, CLEANING, CUTTING, EDGE PREPARATION ETC., WHILE CARRYING OUT ERECTION. NO EXTRA CLAIM ON THIS ACCOUNT WILL BE ENTERTAINED. FOR HUMAN PROTECTION, TEMPORARY INSULATION OVER PIPING TO BE APPLIED AT NO EXTRA COST.

4.4.2.30
BEFORE LAYING THE PIPING ON SUPPORTS, THE COORDINATES AND ELEVATIONS OF ALL SUPPORTS SHALL BE CHECKED BY THE CONTRACTOR FOR CORRECTNESS. DISCREPANCIES FROM THE EXECUTION DRAWINGS, IF ANY, SHALL BE PROMPTLY BROUGHT TO THE NOTICE OF BHEL ENGINEER IN WRITING AND CORRECTION SHALL BE CARRIED OUT AS PER HIS INSTRUCTIONS.

4.4.2.31
NORMALLY, HANGERS SETTING IN COLD CONDITION ARE DONE BY SIMULATION ADDING ADDITIONAL TEMPORARY WEIGHT, WHICH WILL BE ROUGHLY EQUAL TO THE WEIGHT OF THE INSULATION. ATTACHMENT OF TEMPORARY WEIGHTS AND FLOATING OF THE JOINTS IN THE SIMULATION TEST TO BE TREATED AS PART OF JOB. HANGER SETTINGS HAVE TO BE REPEATED FOR ACHIEVING FREE-FLOATING JOINTS. HANGER ADJUSTMENTS TO BE REPEATED FOR STEAM BLOWING BY RESETTING HOT AND COLD VALUES IF REQUIRED. THIS MAY HAVE TO BE REPEATED SEVERAL TIMES AFTER STEAM BLOWING AND SYNCHRONIZATION. THE WEIGHTS WILL BE SUPPLIED BY BHEL. CONTRACTOR HAS TO TRANSPORT FROM BHEL STORES AND RETURN THE SAME AFTER COMPLETION OF WORK. NO EXTRA CLAIM ON THIS ACCOUNT WILL BE ENTERTAINED.

4.4.2.32
ALL THE INSTRUMENTATION TAP-OFF POINTS LIKE THERMOWELLS, ROOT VALVES, IMPULSE LINES, NIPPLES ETC., SHALL ALSO BE ERECTED AND WELDED BY THE CONTRACTOR IRRESPECTIVE OF WHETHER SUCH MATERIALS ARE SUPPLIED BY BHEL OR ANY OTHER AGENCY.

4.4.2.33
THE WELD GROOVES OF MS LINE, HRH LINE, CRH LINE, BFD LINES AND OTHER PIPES WILL BE AS PER BHEL STANDARD SPECIFICATIONS. FURTHER, THE EDGE PREPARATION SHALL BE DONE AS PER INSTRUCTION OF BHEL SITE ENGINEER AND SAME SHALL BE BINDING ON THE CONTRACTOR.

4.4.2.34
ALL EQUIPMENTS / WORKS SHALL BE PRESERVED AND PROTECTED PROPERLY DURING AND AFTER ERECTION. INSTRUCTIONS / DIRECTIONS GIVEN BY BHEL IN THIS CONNECTION WILL HAVE TO BE OBSERVED BY THE CONTRACTOR.

4.4.2.35
THE LOCATION OF TANKS, VESSELS, VALVES, STATIONS ETC IN THE PIPELINES INDICATED IN THE BHEL DRAWINGS MAY BE INDICATIVE ONLY. THE FINAL LOCATION AND ROUTINGS SHALL BE DECIDED TO SUIT THE SITE CONDITIONS. WHILE ROUTING SUCH LINES AND FIXING THE STATIONS, THEY HAVE TO BE ERECTED SO AS TO PROVIDE EASY ACCESSIBILITY AND FREE PATH FOR THE PURPOSE OF EASY OPERATION AND MAINTENANCE. THESE LOCATIONS SHALL BE ACCEPTABLE TO THE CLIENT. SOMETIMES, THE LOCATIONS OF STATIONS AND ROUTING OF LINES MAY HAVE TO BE MODIFIED AS PER THE SITE CONDITIONS. ALL SUCH WORK SHALL BE CARRIED OUT EXPEDITIOUSLY AS PER THE INSTRUCTIONS OF BHEL ENGINEER. THE DECISION OF BHEL ENGINEER IS FINAL AND BINDING ON THE CONTRACTOR.

4.4.2.36
ALL G.I. PIPELINES SHALL BE JOINED BY THREADED (SCREWED) JOINTS. PIPES AND FITTINGS WILL BE SUPPLIED BY BHEL AS COMMERCIALLY AVAILABLE. CONTRACTOR SHALL ARRANGE TO CHECK AND CLEAN AND REAM THE EXISTING THREADS IF NECESSARY, BY RUNNING THREAD CLEANING DIE/TAP OR BY MACHINING. FRESH THREADING SHALL BE DONE IN CASE EXISTING THREAD IS FOUND DAMAGED BEYOND REPAIR AFTER CUTTING OFF THE DAMAGED PORTION WITHIN THE QUOTED RATES. FRESH THREADING SHALL ALSO BE DONE IN G.I. PIPE ENDS CUT TO SUIT SITE LAYOUT.

4.4.2.37
BOTH MALE AND FEMALE THREADS SHALL BE CLEANED OF OIL, GREASE ETC, WITH APPROPRIATE SOLVENT ETC. PRIOR TO JOINTING. JOINTS SHALL BE SEALED BY APPLYING TEFLON TAPE ON MALE THREAD. ALL JOINTS SHALL BE TIGHTENED ADEQUATELY SO AS TO ACHIEVE LEAK-PROOF JOINT. EXPOSED PORTION OF THE

EXTERNAL THREADS SHALL BE COATED WITH ZINC SILICATE PAINT. CONTRACTOR SHALL ARRANGE ALL CONSUMABLES FOR CLEANING, SEALING AND PAINTING.

4.4.2.38
PRESSURE TESTING WITH COMPRESSED AIR AND EXTERNAL APPLICATION OF SOAP SOLUTION OR FLAME OR ANY OTHER BHEL-APPROVED METHOD SHALL BE DONE ON ALL JOINTS. SUCH TESTS MAY HAVE TO BE REPEATED SEVERAL TIMES TO ENSURE A LEAK PROOF SYSTEM. LEAKAGES IF ANY, SHALL BE REPAIRED BY THE CONTRACTOR PROMPTLY ACCORDING TO THE BHEL-APPROVED PROCEDURE/METHOD. ANY ADDITIONAL EXPENSES FOR REPAIR ATTRIBUTABLE TO CONTRACTOR SHALL BE BORNE BY THE CONTRACTOR.

4.4.3 OTHER PRODUCTS AND SYSTEMS

4.4.3.1
DUCTS / EXPANSION BELLOWS ARE NORMALLY SUPPLIED IN LOOSE WALL PLATES / 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 BY LPI AND MADE LEAK PROOF AS PER TECHNICAL INSTRUCTION / REQUIREMENT.

4.4.3.2
CERTAIN STRUCTURAL ITEMS LIKE SILENCER SUPPORTS, ROOF CLADDING STRUCTURE, PLATFORM ETC., WILL BE SUPPLIED IN RUNNING LENGTHS WHICH SHALL BE CUT TO REQUIRED SUITABLE SIZES AND ADJUSTED/TRIMMED AS PART OF WORK.

4.4.3.3
ADDITIONAL PLATFORMS OF PERMANENT NATURE FOR APPROACHING DIFFERENT EQUIPMENTS LIKE ACTUATORS, VALVES, INSTRUMENTS ETC. AS PER SITE / BHEL CLIENT'S REQUIREMENTS, WHICH MAY NOT BE INDICATED IN DRAWINGS, BUT ESSENTIAL FOR SAFE ACCESS, SHALL BE MADE BY THE CONTRACTOR FROM STRUCTURAL STEEL / MATERIALS SUPPLIED IN RANDOM LENGTHS / SIZES. THE CONTRACTOR WILL BE PAID FOR THIS WORK ON ACCEPTED ERECTION TONNAGE RATE FOR STRUCTURES.

4.4.4 LINING & INSULATION

4.4.4.1
HRSG CASING, INLET AND OUTLET DUCTS HAVE TO BE FULLY INSULATED AT SITE WITH CERAMIC WOOL AND SS CLADDING ON GAS FLOW PATH SIDE.

4.4.4.2
APPLICATION OF WOOL INSULATION, SHEET METAL CLADDING, WELDING OF HOOKS/SUPPORTS TO HOLD INSULATION COVERED UNDER THIS CONTRACT, SHALL INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING :-

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

B)
WOOL INSULATIONS ARE RECEIVED AT SITE AS BONDED AND UNBOUNDED MATTRESSES IN STANDARD SIZES. THESE ARE TO BE DRESSED/CUT TO SUIT WORK BY THE CONTRACTOR.

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

D)
OUTER SHEET CLADDING BY FABRICATION OF ALUMINUM 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.

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

F)
PAINTING THE INNER SIDE OF ALUMINUM/GI/STEEL CLADDING, WITH ANTI-CORROSIVE PAINT AS SPECIFIED. THE REQUIRED PAINT AND THINNER IS IN THE CONTRACTOR'S SCOPE. ALSO, ALL OTHER ACCESSORIES CONSTUMABLES FOR PAINTING, CLEANING THE SURFACES ETC SHALL ALSO BE ARRANGED BY THE CONTRACTOR.

G)
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 CUT OPEN 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.

H)
THE SKIN CASING PLATES SCALLOPED BARS AND OTHER MATERIALS THAT ARE TO BE MATCHED WITH THE ERECTED COMPONENTS HAVE TO BE CUT AND RE-WELDED FROM THE FABRICATED PIECES AS INCIDENTAL TO WORK.

I)
WASTAGE ALLOWANCE FOR THE MATERIALS ISSUED SHALL BE AS UNDER :-

(i) REFRACTORY	2%
(ii) WOOL INSULATION	2%
(iii) CLADDING SHEETS V	2%

J)
THE CLADDING INSIDE THE INLET DUCT, CASINGS ETC ARE OF STAINLESS STEEL MATERIAL. SOME TRIMMING/ FINISHING REQUIRED AT SITE DURING FIXING SHALL ALSO BE DONE AS PART OF WORK.

4.4.4.3
APPLICATION OF LINING AND INSULATION ON ALL PIPING COVERED UNDER THIS SPECIFICATION IS ALSO THE PART OF THIS WORK. SIMILARY, IT IS APPLICABLE FOR LINING AND INSULATION OF TG SIDE AUXILIARIES SUCH AS HEATERS, DE-AERATORS ETC. HOWEVER, APPLICATION OF SPRAY INSULATION ON TURBINE & ISOLATION VALVES IS NOT IN THE SCOPE OF WORK.

4.4.5 STEEL STACK/ CHIMNEY

1.
THE DETAILS OF CHIMNEY IS AS FOLLOWS:

CHIMNEY INNER DIAMETER	: 6.5 M
CHIMNEY TOTAL HEIGHT	: 75 M
TOTAL CHIMNEY ESTIMATED PGMA WEIGHT	: 450 MT
TOTAL NUMBER OF SHELLS	: 30
CHIMNEY BASE	: 50 mm Thick

SHELL THICKNESS VARIOUS AS FOLLOWS :

40mm Thick Shell	:	2nos
36mm Thick Shell	:	3nos
32mm Thick Shell	:	3nos
28mm Thick Shell	:	3nos
25mm Thick Shell	:	4nos
20mm Thick Shell	:	4nos
16mm Thick Shell	:	2nos
14mm Thick Shell	:	9nos

TOTAL SHELL WEIGHT : 350 MT Approx.

EACH SHELL WILL BE 2.5 M HIGH AND SHELLS ARE SENT IN TWO HALVES.

TOP TWO SHELLS FOR A HIGHT OF 5mm WILL HAVE 1.6mm THICK SS LINING.
ALL SHELLS ARE TO BE WELDED AS PER ERECTION DETAIL.FLANGE HOLES ARE GIVEN FOR LOCATING/ ERECTION/ ALIGNMENT PURPOSE ONLY.
2.
WELDING OF CHIMNEY JOINTS SHALL BE CARRIED OUT BY CERTIFIED WELDER. WHEREVER NECESSARY, RADIOGRAPHY HAVE TO BE TAKEN TO MEET THE BHEL/STATUTORY REQUIREMENTS.

3.
CHIMNEY HAS TO BE INSULATED UPTO FULL HEIGHT AND APPROXIMATE . INSULATION THICKNESS: IS 80mm LRB WOOLMATTRESS, HOWEVER ACTUAL INSULATION THICKNESS SHALL BE AS PER DRAWINSG WHICH WILL BE PROVIDED DURING EXECUTION OF WORK AT SITE.

4.
HELICAL STRAKES AS INDICATED IN THE ERECTION DRAWINGS ARE TO BE WELDED ONTO THE CHIMNEY.

5.
CHIMNEY BASE WILL BE SUPPLIED IN TWO HALVES, WHICH WILL HAVE TO BE ASSEMBLED AT SITE.

6.
PAINTERS TROLLEY WILL BE SUPPLIED IN PARTS AND WILL HAVE TO BE ASSEMBLED.

7.
ALL ELECTRICAL WORKS SUCH AS LIGHTENING ARRESTORS, EARTHING AND AVIATION LIGHTS ETC IS IN THE SCOPE OF WORK.

8.
STACK/ CHIMNEY HAS TO BE PAINTED AS PER THE REQUIREMENT OF AVIATION / RELEVANT BIS STANDARDS.

9.
STEEL MAIN STACK IS INSULATED FOR FULL HEIGHT

10.
TYPICAL INPUT FOR CHIMNEY ELECTRICAL WORKS OF AVIATION LIGHTING, LIGHTENING ARRESTORS AND EARTHING ETC. SHALL BE CARRIED OUT AS PER DRAWING REQUIREMENT.

11.
THERE WILL BE STAINLESS STEEL LINING OF 1.6 MM THICK FOR TOP 5 METERS HEIGHT OF CHIMNEY SHELL.

4.6.0
TESTING, PRE-COMMISSIONING, COMMISSIONING AND POST COMMISSIONING

4.6.1
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, WATER, OIL/LUBE OIL, GAS, STEAM AS THE CASE MAY BE; CHEMICAL CLEANING/EDTA CLEANING OF VARIOUS SYSTEMS & PIPING; STEAM BLOWING OF THE PIPE LINES; FLOATING OF SAFETY VALVES ETC ARE SOME OF THESE ACTIVITIES LEADING TO COMBINED CYCLE OPERATION, TRIAL OPERATION AND RELIABILITY RUN OF COMPLETE SET. ALL THE ACTIVITIES FOR COMMISSIONING OF THE SET, AS INFORMED BY BHEL FROM TIME TO TIME SHALL BE COMPLETED.

4.6.2
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.

4.6.3
CONTRACTOR SHALL LAY / INSTALL NECESSARY TEMPORARY PIPING, TANKS, PUMPS, VALVES, BLANKS, GAUGES, CABLES, SWITCHES ETC., FOR CONDUCT OF HYDRAULIC / PRESSURE TEST, CHEMICAL CLEANING/ EDTA CLEANING, STEAM / AIR BLOWING ETC. THIS MAY INVOLVE CUTTING OF SOME PORTION OF EXISTING PIPING / VALVES, PLACING OF RUBBER WEDGES / BLANKS IN THE VALVES AND OTHER OPENINGS. WHERE REQUIRED, BENDS HAVE TO BE FABRICATED / FORMED AT SITE FROM RANDOM LENGTH / SIZE OF PIPES / STRUCTURAL STEEL. TEMPORARY INSTALLATION ITSELF HAS TO BE TESTED, TRIED, AND SUBJECT TO NON-DESTRUCTIVE EXAMINATIONS AS PER THE INSTRUCTIONS OF BHEL AS PART OF WORK.

4.6.4
FOR THE INSTALLATION OF TEMPORARY SYSTEM AS ABOVE BHEL WILL PROVIDE ONLY THE PIPING, CHEMICAL CIRCULATION PUMPS WITH MOTORS, STRUCTURAL ITEMS FOR SUPPORTS AND ACCESS PLATFORMS, TANKS/ PLATES FOR FABRICATION OF TANK, VALVES, GAUGES AND THEIR FITTINGS, AND THERMAL INSULATION. THESE WILL BE SUPPLIED IN RANDOM SIZES / LENGTHS. HOWEVER, 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. ALL ABOVE WORKS SHALL BE CARRIED OUT AS PART OF SCOPE OF WORK. CONTRACTOR SHALL MAKE THE FOUNDATION FOR

BHEL SUPPLIED CHEMICAL CIRCULATION PUMPS AS PER REQUIREMENT AND AS SCOPE OF WORK.

4.6.5
FABRICATION, FIT-UP, PRE-HEATING, WELDING, AND POST-WELD-HEAT TREATMENT IF ANY, OF REQUISITE BLANKS FOR CONDUCT OF HYDRAULIC TEST / LEAKAGE TEST IS PART OF WORK. SIMILARLY, REMOVAL OF BLANKS, RESTORATION AND NORMALIZATION OF THE CONCERNED SYSTEM / LINE IS TO BE DONE AS PART OF WORK. BHEL WILL PROVIDE THE MATERIAL FOR BLANKS FREE OF CHARGE. NO SEPARATE PAYMENT IS ENVISAGED FOR THESE ACTIVITIES.

4.6.6
CLEANING, SERVICING OF TANKS, VALVES, PUMPS, EQUIPMENTS ETC DURING VARIOUS STAGES OF ERECTION, TESTING AND COMMISSIONING ARE IN THE SCOPE OF WORK. GASKETS, PACKING & SPARES FOR REPLACEMENT WILL BE PROVIDED FREE OF CHARGES BY BHEL.

4.6.7
FOR VARIOUS PRE-COMMISSIONING / COMMISSIONING ACTIVITIES / PROCESSES MENTIONED IN VARIOUS CLAUSES, TRANSPORT OF CHEMICALS FROM BHEL/ CUSTOMER'S STORES, CHARGING OF CHEMICALS INTO THE SYSTEM AND RETURNING OF REMAINING CHEMICALS AND THE EMPTY CONTAINERS OF THE CHEMICALS TO CUSTOMER / BHEL STORES IS THE RESPONSIBILITY OF THE CONTRACTOR.

4.6.8
DURING TRIALS/ TESTS, PRE-COMMISSIONING / COMMISSIONING, REPLACING / CHANGING MECHANICAL / OTHER SEALS OF EQUIPMENTS LIKE PUMPS, REMOVAL AND CLEANING / REPLACING OF FILTERS ETC IS WITHIN THE SCOPE OF WORK. SPARES SHALL BE PROVIDED BY BHEL.

4.6.9
IN CASE ANY DEFECT IS NOTICED DURING TESTS, TRIAL RUNS OF ALL EQUIPMENTS AND THEIR AUXILIARIES, SUCH AS INTERFERENCES, RUBBING, LOOSE COMPONENTS, ABNORMAL NOISE OR VIBRATION, STRAIN ON CONNECTED EQUIPMENT ETC., THE CONTRACTOR SHALL IMMEDIATELY ATTEND TO THESE DEFECTS AND TAKE NECESSARY CORRECTIVE MEASURES. IF ANY READJUSTMENT AND REALIGNMENT ARE NECESSARY, THE SAME SHALL BE DONE AS PER BHEL ENGINEER'S INSTRUCTIONS. CLAIM, IF ANY, FOR THESE WORKS FROM THE CONTRACTOR SHALL BE GOVERNED BY CLAUSES 13.1 TO 13.8.

4.6.10
CONTRACTOR SHALL CUT / OPEN / DISMANTLE WORK, IF NEEDED, AS PER BHEL ENGINEER'S INSTRUCTIONS DURING COMMISSIONING FOR INSPECTION, CHECKING AND MAKE GOOD THE WORKS AFTER INSPECTION IS OVER.

SIMILARLY, DURING THE COURSE OF ERECTION, IF CERTAIN PORTION OF EQUIPMENTS ERECTED BY THE CONTRACTOR HAS TO BE UNDONE FOR ENABLING OTHER CONTRACTORS / AGENCIES OF BHEL / CUSTOMER TO CARRY OUT THEIR WORK, CONTRACTOR SHALL CARRY OUT SUCH JOBS EXPEDITIOUSLY AND PROMPTLY AND MAKE GOOD THE JOB AFTER COMPLETION OF WORK BY OTHER CONTRACTORS / AGENCIES OF BHEL / CUSTOMER AS PER BHEL ENGINEER'S / AGENCIES OF BHEL / CUSTOMERS INSTRUCTIONS. CLAIMS, IF ANY, IN THIS REGARD SHALL BE GOVERNED AS PER CLAUSES 13.1 TO 13.8.

4.6.11
DURING THIS PERIOD, THOUGH BHEL/ CLIENT'S STAFF WILL ALSO BE ASSOCIATED IN THE WORK, THE CONTRACTOR'S RESPONSIBILITY WILL BE TO ARRANGE FOR COMPLETE REQUIREMENT OF MEN AND REQUIRED TOOLS AND PLANTS,

CONSUMABLES, SCAFFOLDING AND APPROACHES ETC., TILL SUCH TIME THE UNIT IS TAKEN OVER.

4.6.12
COMMISSIONING ACTIVITIES WILL CONTINUE TILL THE COMPLETION OF TRIAL OPERATION AND RELIABILITY RUN. DURING THIS PERIOD CONTRACTOR SHALL MAKE AVAILABLE THE SERVICES OF SEPARATE DEDICATED WORKFORCE COMPRISING OF SUITABLE SKILLED AND SEMI-SKILLED / UN-SKILLED WORKMEN AND SUPERVISORY STAFF ALONG WITH NECESSARY TOOLS AND PLANTS, CONSUMABLES ETC AS PART OF WORK.

4.6.13
IT SHALL BE SPECIFICALLY NOTED THAT THE CONTRACTOR MAY HAVE TO WORK ROUND THE CLOCK DURING THE PRE-COMMISSIONING AND COMMISSIONING PERIOD ALONG WITH BHEL ENGINEERS AND HENCE CONSIDERABLE OVERTIME PAYMENT IS INVOLVED. THE CONTRACTOR'S QUOTED RATES SHALL BE INCLUSIVE OF ALL THESE FACTORS.

4.6.14
THE CONTRACTOR SHALL CARRY OUT ANY OTHER TESTS AS DESIRED BY BHEL ENGINEER ON ERECTED EQUIPMENT COVERED UNDER THE SCOPE OF THIS CONTRACT DURING TESTING, PRE-COMMISSIONING AND COMMISSIONING, TO DEMONSTRATE THE COMPLETION OF ANY PART OR WHOLE OF WORK PERFORMED BY THE CONTRACTOR.

4.7 FINAL PAINTING

GSEG's SPECIFICATION **NO.TCE.4915A-H-500-001** WITH REGARD TO SURFACE PREPARATION AND FINAL PAINTING WITH COLOUR CODES / SCHEME FOR SURCACE PREPARATION AND FINISH PAINTS COATING INCLUDING PRIMER COATING FOR SHOP AND FIELD PAINTING IS ATTACHED SEPARATELY ALONG WITH THIS TENDER SPECIFICATION FOR READY REFERENCE. CONTRACTOR SHALL CARRY OUT SURFACE PREPARATION AND FINAL PAINTING WORKS AS PER CUSTOMER SPECIFICATION AND INSTRUCTION OF BHEL ENGINEER AT SITE.

4.7.1
BHEL WILL PROVIDE THE PRIMER, THINNER & PAINTS FOR FINAL PAINTING. ALL OTHER CONSUMABLES LIKE BRUSH, CLEANING AGENTS ETC AND ALL T&P INCLUDING SCAFOLDING MATERIALS, MANPOWER, SUPERVISION IS CONTRACTOR'S SCOPE.

4.7.2
COMPONENTS OF THE BOILER & AUXILIARIES WILL IN GENERAL BE SUPPLIED PAINTED BY BHEL MANUFACTURING UNITS AS PER THEIR STANDARD APPLICABLE PAINTING SCHEMES. CONTRACTOR SHALL CARRY OUT PRIMER AND FINISH PAINTING COATS AND DFT REQUIREMENT WITH COLOUR CODES & SPECIFICATIONS AS PER REQUIREMENT OF CUSTOMER..

ALL EXPOSED METAL PARTS OF THE EQUIPMENT INCLUDING PIPING, SUPPORTS, STRUCTURES, RAILING, TANKS/VESSELS, STEEL STACK, ETC., AS APPLICABLE SHALL BE PAINTED AFTER THOROUGHLY CLEANING THE SURFACE TO MAKE IT FREE FROM DUST, RUST, GREASES, OILS, SCALES, ETC, BY WIRE BRUSH, SCRAPPING, MECHANICAL MEANS ETC; AS SPECIFIED IN RELEVANT DOCUMENTS.

4.7.3
IN ADDITION TO COMPONENTS/EQUIPMENT AS ABOVE, THERE COULD BE FEW OTHERS WITHOUT ANY PROTECTIVE COATING. SUCH COMPONENTS SHALL FIRST BE THOROUGHLY CLEANED OF ALL DIRT, RUST, SCALES, GREASES, OILS AND OTHER FOREIGN MATERIALS BY WIRE BRUSHING, SCRAPING, WASHING, WIPING WITH SOLVENT OR ANY APPROPRIATE METHOD AND THE SAME BEING INSPECTED

AND APPROVED BY BHEL FOLLOWED BY APPLICATION OF PRIMER COAT AND FINAL FINISH PAINTS COATS OF REQUIRED DFT SHALL BE AS PER CUSTOMER REQUIREMENT & ROCEDURE PRESCRIBED BY THE PAINT MANUFACTURER.

4.7.4
WHERE THE SHOP PAINTING HAS PEELED OFF, THE AFFECTED AREA SHALL BE CLEANED THOROUGHLY BY THE SPECIFIED METHOD AND THEN APPLY PRIMER COATS AND FINISH PAINT COATS.

4.7.5
IN ADDITION, MARKING OF COLOUR BANDS, LEGENDS AND IDENTIFICATION MARKS, DIRECTION OF FLOW/ROTATION MARKS ETC IN VARIOUS AREAS AS SPECIFIED IS PART OF WORK.

4.7.6
THIS WORK REQUIRES WORKING AT HIGHER ALTITUDES FROM GROUND LEVEL TO AS HIGH AS 75 M. THE WORK SPREAD IS ALSO SUBSTANTIAL INVOLVING SUBSTANTIAL RUN OF STRUCTURES AND PIPING. CONTRACTOR SHALL TAKE SUFFICIENT PRECAUTIONS TO AVOID ANY ACCIDENT AND HAZARD IN ALL RESPECTS. THE ROPES, LADDERS, SCAFFOLDING MATERIALS, CLAMPS ETC AND CLIMBER USED SHOULD BE OF APPROPRIATE QUALITY FOR SAFE AND SMOOTH EXECUTION OF WORK.

4.7.7
CONTRACTOR SHALL CARRY OUT THE WORK IN SUCH A WAY THAT OTHER ERECTED EQUIPMENT, STRUCTURE, CIVIL FOUNDATIONS AND OTHER PROPERTY ARE NOT DAMAGED. FOR DAMAGES IN ANY OF SUCH CASES DUE TO LAPSES BY CONTRACTOR, BHEL SHALL HAVE THE RIGHT TO RECOVER THE COST OF SUCH DAMAGES FROM THE CONTRACTOR.

4.7.8
CONTRACTOR SHALL TAKE DUE CARE TO COVER/PROTECT THE EQUIPMENT WHICH ARE ALREADY PAINTED WHILE CARRYING OUT THE PAINTING OF OTHER ADJACENT EQUIPMENT. IF SO HAPPENS, IT SHALL BE CLEANED AND REPAINTED BY THE CONTRACTOR WITHOUT ANY EXTRA CHARGES.

4.7.9
IN GENERAL, PAINTING OF STRUCTURAL PARTS AND COLOUR BANDS, LETTERING, MARKING OF DIRECTION OF FLOW/ROTATION ETC WILL BE CARRIED OUT BY BRUSH PAINTING. HOWEVER, AREAS/ EQUIPMENT INACCESSIBLE FOR MANUAL PAINTING HAVE TO BE PAINTED BY SPRAY PAINTING. THE DECISION OF BHEL ENGINEER, IN THIS REGARD, SHALL BE FINAL AND BINDING ON THE CONTRACTOR. FOR THE PURPOSE OF SPRAY PAINTING CONTRACTOR WILL HIS OWN COMPRESSED AIR ARRANGEMENT, SPRAY EQUIPMENTS ETC. INCLUDING LAYING OF AIR PIPELINE, HOSE AND ANY OTHER LINE REQUIRED SHALL BE DONE BY CONTRACTOR AT HIS COST.

4.7.10
THE CONTRACTOR SHALL PROVIDE ALL THE NECESSARY SCAFFOLDING MATERIALS, TEMPORARY STRUCTURES AND NECESSARY SAFETY DEVICES ETC, DURING EXECUTION OF THE WORK.

4.7.11
FINAL PAINTING WORK SHALL BE STARTED AFTER OBTAINING CLEARANCE FROM BHEL ENGINEERS AND AS PER HIS INSTRUCTIONS.

4.8
FOR ANY CLASS OF WORK FOR WHICH NO SPECIFICATIONS HAVE BEEN LAID DOWN IN THESE SPECIFICATIONS, WORK SHALL BE EXECUTED AS PER THE INSTRUCTIONS OF BHEL.

4.9
ERECTION, INSTALLATION, TESTING AND COMMISSIONING OF HP AND LP DOSING SYSTEM WITH RELATED PIPING (S.S.), VALVES, FITTINGS ETC. WHICH WILL BE SUPPLIED FROM DIFFERENT SOURCES, SHALL BE CARRIED OUT BY CONTRACTOR UNDER THESE TENDER SPECIFICATIONS AS PER INSTRUCTION OF BHEL ENGINEER.

4.10
INSTRUMENT AIR AND SERVICE PIPING WORK INCLUDED UNDER THESE TENDER SPECIFICATION IS FOR COMPLETE HRSG, GT & GTG, ST&STG AND BALANCE OF PLANT EQUIPMENTS & AUXILIARIES. CONTRACTOR SHALL CARRYOUT THE WORK AS PER SEQUENCE, ROUTING AND PRIORITY DECIDED BY BHEL ENGINEER AT SITE. WORK SHALL INCLUDE THE THREADS CUTTING, ERECTION & INSTALLATION, CONDUCTANCE OF LEAK TEST & PRESSURE TEST AS PART OF WORK. ERECTION & INSTALLATION OF MOISTURE TRAPS, DRAIN POTS, VALVES, SUPPORTING ETC. SHALL BE CARRIED OUT AS SCOPE OF WORK. REQUIRED SEALING COMPOUND / CONSUMABLES SHALL BE PROVIDED BY CONTRACTOR.

4.11 EXCLUSIONS
THE FOLLOWING WORKS ARE SPECIFIC EXCLUSIONS FROM THE SCOPE OF WORK / SPECIFICATION: -

I) SOME SUB - DELIVERY ITEMS AND ELECTRICAL COMPONENTS SUCH AS PUSH BUTTONS, JUNCTION BOXES ETC.

II) E&C WORK OF CABLE TRAYS, CABLES AND EARTHING EXCEPT SPECIFICALLY MENTIONED.

III) ERECTION OF CONTROL PANELS (EXCEPT THAT OF STACK ELECTRICAL WORK IF ANY), MCC ETC, CALIBRATION OF INSTRUMENTS.

IV) ALL ELECTRICAL AND CONTROL & INSTRUMENTATION ITEMS EXCEPT THOSE SPECIFIED HEREIN.

V) CIVIL WORKS EXCEPT TO THE EXTENT SPECIFICALLY INDICATED ELSEWHERE IN THIS TENDER.

VI) PNEUMATIC COPPER TUBING AND FITTINGS THEREOF.

SECTION-5

SPECIAL CONDITIONS OF CONTRACT

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

5.1
ACCOMMODATION, DRINKING WATER & LOCAL TRANSPORTATION FOR THE LABOUR OTHER EMPLOYEES

BHEL/CLIENT IS NOT PROVIDING ANY SPACE FOR LABOUR COLONY. CONTRACTOR SHALL MAKE HIS OWN ARRANGEMENTS FOR ACCOMODATION WITH NECESSARY FACILITIES OF LIGHTING, SANITATION, MEDICAL FACILITY ETC WITH ALL HYGIENE'S FOR HIS WORKMEN AND THE STAFF OUT SIDE THE PROJECT PREMISES. 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
THE CONTRACTOR SHALL PROVIDE ALL (EXCEPTING THOSE INDICATED 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. PLEASE REFER RELEVANT APPENDIX FOR THE LIST OF T&P BEING PROVIDED BY BHEL FREE OF CHARGES ON SHARING BASIS.

5.2.2
ALL TOOLS AND TACKLES TO BE DEPLOYED BY THE CONTRACTOR FOR THE WORK SHALL HAVE THE PRIOR APPROVAL OF BHEL ENGINEER WITH REGARD TO BRAND, QUALITY AND SPECIFICATION. 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 NECESSARY FOR TIMELY AND SATISFACTORY COMPLETION OF THE WORK IN SCOPE.

5.2.3
AS REGARDS THE HYDRAULIC TEST PUMPS, WATER FILL PUMPS AND CHEMICAL FILLING PUMPS ETC WHICH HAVE TO BE USED IN TEMPORARY INSTALLATIONS FOR THE RESPECTIVE PURPOSE HAVE TO BE ARRANGED BY THE CONTRACTOR. BHEL WILL PROVIDE CHEMICAL CIRCULATION PUMPS WITH MOTOR AS INDICATED APPENDIX-III.

5.2.4
TIMELY DEPLOYMENT OF ADEQUATE QUANTITY OF T&P IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BE PREPARED TO AUGMENT THE T&P AT SHORT NOTICE TO MATCH THE PLANNED PROGRAMME AND TO ACHIEVE THE MILESTONES.

5.2.5
CONTRACTOR SHALL MAINTAIN AND OPERATE HIS TOOLS AND PLANTS IN SUCH A WAY THAT MAJOR BREAKDOWNS ARE AVOIDED. IN THE EVENT OF MAJOR BREAKDOWN, CONTRACTOR SHALL MAKE ALTERNATIVE ARRANGEMENTS EXPEDITIOUSLY SO THAT THE PROGRESS OF WORK IS NOT HAMPERED.

5.2.6
IN THE EVENT OF CONTRACTOR FAILING TO ARRANGE THE REQUIRED TOOLS, PLANTS, MACHINERY, EQUIPMENT, MATERIAL OR NON-AVAILABILITY OF THE SAME OWING TO BREAKDOWN, BHEL WILL MAKE THE ALTERNATIVE ARRANGEMENT AT THE RISK AND COST OF THE CONTRACTOR.

5.2.7
THE T&P TO BE ARRANGED BY THE CONTRACTOR SHALL BE IN PROPER WORKING CONDITION AND THEIR OPERATION SHALL NOT LEAD TO UNSAFE CONDITION. THE MOVEMENTS 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.

5.2.8
USE OF WELDING GENERATORS/ RECTIFIERS FOR WELDING ONLY SHALL BE PERMITTED. USE OF WELDING TRANSFORMERS WILL BE SUBJECT TO SPECIFIC APPROVAL OF BHEL ENGINEER.

5.2.9
THE CONTRACTOR AT HIS COST SHALL CARRY OUT PERIODICAL TESTING OF HIS CONSTRUCTION EQUIPMENTS AND CALIBRATION OF MEASURING & 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.**

5.2.10
CONTRACTOR SHALL TRANSPORT BHEL'S 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 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. CONTRACTOR SHALL PROVIDE ALL ENABLING SERVICES WITH TOOLS AND TACKLES FOR ASSEMBLY/DISMANTLING AS ABOVE.

5.2.11
CRANES FOR ERECTION OF HRSG STRUCTURES, DUCTS & CASING, HEAT TRANSFER MODULES, BOILER DRUMS AND STEEL STACK/CHIMNEY ETC.

CONTRACTOR SHALL PROVIDE CRAWLER CRANES OF ADEQUATE CAPACITY FOR ERECTION OF HRSG STRUCTURES, DUCTS & CASING, STEEL STACK/CHIMNEY SHELLS, HEAT TRANSFER MODULES AND HP, IP AND LP CIRCUIT BOILER DRUMS.

(1)
IT IS ANTICIPATED THAT WITH 75 T CAP CRAWLER CRANE INITIAL ERECTION OF STRUCTRUES, CASING ETC AND CHIMNEY UP TO CERTAIN HEIGHT CAN BE CARRIED OUT. THIS CRANE WILL ALSO BE REQUIRED FOR UPRIGHTING OF HEAT TRANSFER MODULES AS TRAILING CRANE (REFER CLAUSE 4.4.1.1). THIS CRANE WILL BE REQUIRED FROM START OF ERECTION TILL THE COMPLETION OF WORK.

(2)
FOR ERECTION OF HEAT TRANSFER MODULES AND ALMOST FULL HEIGHT OF CHIMNEY IT IS EXPECTED THAT A CRAWLER CRANE OF 150-180 T CLASS CRANE MAY BE ADEQUATE. THIS CRANE MAY BE REQUIRED FROM THE START OF ERECTION OF HEAT TRANSFER MODULES (SAY FROM 3RD MONTH) TILL THE COMPLETION OF

STEEL STACK/ CHIMNEY ERECTION WITH ALL PLATFORM AND PAINTER'S TROLLEY ETC.

(3)
FOR ERECTION OF ALL BOILER DRUMS, WITH HP DRUM BEING THE HEAVIEST, IST IS EXPECTED THAT A CRANE OF CLASS 400-600 T WITH SUPERLIFT ATTACHMENT MAY BE REQUIRED. THIS MAY BE REQUIRED FOR A SHORTER DURATION AND SPECIFIC PURPOSE. THIS MAY ALSO BE REQUIRED FOR COMPLETION OF ERECTION ANY COMPONENTS/ ITEMS OF STEEL STACK / CHIMNEY WHICH IS BEYOND THE CAPACITY OF 150-180 T CLASS CRANE MENTIONED ABOVE.

THE ABOVE ARE ONLY INDICATIVE AND CONTRACTOR SHALL MAKE HIS OWN ASSESSMENT AND CONFIRM FROM HIS END. THE HRSG ELEVATION AND PLAN DRAWINGS ATTACHED AS PART OF THESE SPECIFICATIONS MAY BE REFERRED.

5.2.12
CONTRACTOR SHALL PROVIDE THE FUEL, LUBRICANTS AND ALL OTHER CONSUMABLES FOR ALL THE CRANES DEPLOYED BY HIM. FURTHER, HE SHALL PROVIDE THE OPERATORS AND OTHER CREW FOR ALL THE CRANES.

5.2.13 SCAFFOLDING MATERIALS

CONTRACTOR SHALL PROVIDE ALL THE NECESSARY SCAFFOLDING MATERIALS, TEMPORARY STRUCTURES AND NECESSARY SAFETY DEVICES ETC, DURING ALL STAGES TILL SUCCESSFUL COMPLETION OF WORK. SCAFFOLDING MATERIALS (MS PIPES, GRATINGS ETC) SHALL BE OF LIGHT WEIGHT CONSTRUCTION. CONTRACTOR SHALL ARRANGE STEEL PIPES & CLAMPS WITH ACCESSORIES LIKE BASE PLATE ATTACHMENT, FIXING PINS, STRUTS ETC FOR SCAFFOLDING REQUIRED FOR THIS WORK. IT IS TO BE SPECIFICALLY NOTED THAT NO WOOD OR ANY SUCH OTHER INFLAMMABLE MATERIAL WILL BE PERMITTED TO BE USED FOR ABOVE APPLICATIONS. ANY SUCH USE ON EACH OCCASSION SHALL INVITE LEVY OF PENALTY AS DEEMED FIT BY BHEL ENGINEER.

5.3 CONSUMABLES

5.3.1
THE CONTRACTOR SHALL PROVIDE ALL CONSUMABLES REQUIRED FOR CARRYING OUT THE WORK COVERED UNDER THESE SPECIFICATIONS EXCEPTING THOSE 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

ALL PRESERVATION PRIMERS WITH PAINTS FOR ENTIRE WORKS IS IN THE CONTRACTOR'S SCOPE UNLESS PROVIDED OTHERWISE IN BHEL SCOPE AS FREE ISSUE.

5.3.4 CONSUMABLES FOR BHEL SUPPLIED EQUIPMENTS (CRANES, T &P ETC)

REFER RELEVANT CLAUSE OF SECTION-7 SPECIAL CONDITIONS OF CONTRACT IN THIS REGARD.

5.4 WELDING ELECTRODES, FILLER WIRES FOR TIG WELDING AND GASES

5.4.1

FILLER WIRES, FOR TIG WELDING OF PIPING, TO THE EXTENT SUPPLIED BY THE MANUFACTURING UNITS OF BHEL ALONGWITH THE COMPONENTS / EQUIPMENTS ONLY SHALL BE PROVIDED (PROPORTIONATELY WHERE CERTAIN PIPING WORK ARE BEING DONE BY OTHER AGENCY) BY BHEL AS FREE ISSUE. CONTRACTOR SHALL AT HIS COST MEET REQUIREMENTS OF TIG FILLER WIRES, IF ANY, BEYOND THESE FREE ISSUES BY BHEL. **SIMILARLY, BHEL WILL PROVIDE AS FREE ISSUE THE WELDING ELECTRODE FOR WELDING OF T-91/P-91 MATERIAL TUBES/PIPES RELEASED AS PART OF SUPPLY FROM MANUFACTURING UNIT OF BHEL.**

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. ARGON GAS FOR P-91 PIPE JOINTS WELDING PROCESS SHALL BE CONFORMING TO GRADE–3 OF IS:5760-1998 WITH OXYGEN AND WATER VAPOUR RESTRICTED TO MAXIMUM 6 PPM EACH AND WITH ARGON PURITY LEVEL OF MINIMUM 99.99%. THE SUPPLY SHOULD ACCOMPANY TEST CERTIFICATE FOR THE BATCH INDICATING INDIVIDUAL ELEMENT 'PPM' LEVEL AND OVERALL PURITY LEVEL.

5.4.3

IT IS TO BE SPECIFICALLY NOTED THAT CONTRACTOR SHALL ALL THE REQUIRED WELDING ELECTRODES AS APPROVED ONLY BY BHEL SHALL BE PERMITTED FOR USE. 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.

5.4.4

GASES LIKE ARGON, OXYGEN, AND ACETYLENE ETC THAT ARE REQUIRED FOR ERECTION RELATED ACTIVITIES SHALL BE ARRANGED BY THE CONTRACTOR AT HIS COST.

5.4.5

NITROGEN GAS, IF REQUIRED, FOR PRESERVATION OF BOILER AND NITROGEN CAPPING DURING CHEMICAL CLEANING PROCESS, WILL BE PROVIDED BY BHEL FREE OF CHARGE. CONTRACTOR SHALL ARRANGE NECESSARY CONNECTOR, NIPPLE, REGULATOR, HEADER AND PIPING FOR USAGE OF SUCH GAS FROM CYLINDERS.

5.4.6

FOR WELDING OF SS JOINTS, IF ANY, PURGING GASES, PAPER DAMS ETC SHALL BE ARRANGED BY THE CONTRACTOR AS HIS SCOPE.

5.5 FIELD OFFICE AND STORES, LOCALIZED LIGHTING, LABOUR COLONY ETC

5.5.1

THE CONTRACTOR SHALL MAKE HIS OWN ARRANGEMENTS FOR FIELD OFFICE CUM STORES. ONLY SMALL OPEN SPACE AS PER AVAILABILE LOCATION WILL BE PROVIDED BY CUSTOMER FREE OF CHARGE. **AS SUCH THERE IS LIMITATION /**

SHORTAGE OF OPEN SPACE IN SIDE THE PROJECT PREMISE AND LOOKING TO THIS ASPECT CONTRACTOR WILL PLAN HIS SMALL PORTABLE TYPE (PORTA CABIN) OFFICE CUM T&P STORAGE ARRANGEMENT AT SITE. AFTER THE COMPLETION OF WORK, CONTRACTOR SHALL DISMANTLE HIS STRUCTURES/ INSTALLATIONS AND HANDOVER THE VACANT LAND TO BHEL/CUSTOMER.

5.5.2
ON COMPLETION OF WORK, ALL THE TEMPORARY BUILDINGS, STRUCTURES, PIPELINES, CABLES, ETC SHALL BE DISMANTLED AND LEVELED AND DEBRIS SHALL BE REMOVED AS PER INSTRUCTION OF BHEL BY THE CONTRACTOR AT HIS COST. IN THE EVENT OF HIS FAILURE TO DO SO, THE SAME WILL BE ARRANGED TO BE REMOVED AND EXPENDITURE THEREOF WILL BE RECOVERED FROM THE CONTRACTOR. THE DECISION OF BHEL ENGINEER IN THIS REGARD SHALL BE FINAL. HOWEVER, THE SCOPE OF DISMANTLING AND LEVELING THE AREA IS LIMITED ONLY TO THE CONTRACTOR'S SITE OFFICE, YARD AND OTHER SPACES OCCUPIED BY THE CONTRACTOR.

5.5.3
LABOUR COLONY
CUSTOMER/BHEL SHALL NOT PROVIDE ANY LAND / SPACE FOR CONSTRUCTION OF LABOUR COLONY. CONTRACTOR SHALL MAKE HIS OWN ARRANGEMENTS FOR ACCOMMODATION OF LABOUR & STAFF INCLUDING THE PROVIDING THE OPEN SPACE, CONSTRUCTION OF LABOUR COLONY ETC. INCLUDING LIGHTING, WATER, SANITATION ETC WITH HYGIENE AND COMPLY WITH ALL REQUIREMENTS.

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, SWITCH-BOARDS ETC. BHEL/CLIENT WILL NOT PROVIDE ANYTHING IN THIS REGARD.

5.7 CONSTRUCTION POWER & WATER

5.7.1
CONSTRUCTION POWER (THREE PHASE, 415V / 440V) WILL BE PROVIDED AT ONE POINT NEAR THE SITE APPROXIMATLY 300 METERS FROM ERECTION SITE FREE OF CHARGE. HOWEVER THE CONTRACTOR SHALL PROVIDE ENERGY METER (CALIBRATED) FOR MEASURING THE CONSUMPTION OF POWER IN THEIR WORKS. 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 AND FURTHER DISTRIBUTION SHALL BE ARRANGED BY THE CONTRACTOR.OBTAINING APPROVALS, PAYMENT OF NECESSARY FEES, DUTIES ETC TOWARDS THE CLEARANCE OF SUCH INSTALLATIONS, PRIOR TO THESE BEING PUT TO USE OR AS MAY BE SPECIFIED, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

BHEL SHALL NOT BE RESPONSIBLE FOR ANY LOSS OR DAMAGE TO THE COTRACTOR'S EQUIPMENT AS A RESULT OF VARIATIONS IN VOLTAGE OR FREQUENCY OR INTERRUPTIONS IN POWER SUPPLY.

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 ANY TAXES, DUTIES, LEVIES, CHARGES SHALL BE BORNE BY THE CONTRACTOR. ALL ARRANGEMENTS FOR FURTHER DISTRIBUTION WITH NECESSARY METER AND METERING ARRANGEMENT HAS TO BE MADE BY THE CONTRACTOR.

5.7.4
CONTRACTOR SHALL BE WELL EQUIPPED WITH BACK-UP POWER SUPPLY ARRANGEMENT LIKE DG SET AND DIESEL OPERATED WELDING MACHINE ETC. TO TACKLE SITUATIONS ARISING DUE TO FAILURE OF CUSTOMER SUPPLIED POWER, SO AS TO ENSURE CONTINUITY AND COMPLETION OF CRITICAL PROCESSES THAT ARE UNDERWAY AT THE TIME 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.

5.8 RESPONSIBILITIES WITH REGARD TO LABOUR EMPLOYMENT ETC.

REFER CLAUSE 2.8 OF GENERAL CONDITIONS OF CONTRACT ALSO IN THIS REGARD.

5.8.1
CONTRACTOR SHALL ALSO COMPLY WITH THE REQUIREMENTS OF LOCAL AUTHORITIES/ STATUTORY AUTHORITIES / PROJECT AUTHORITIES CALLING FOR POLICE VERIFICATION OF ANTECEDENTS OF THE WORKMEN, STAFF ETC.

5.8.2
BHEL / CUSTOMER MAY INSIST FOR WITNESSING THE REGULAR PAYMENT TO THE LABOUR. THEY MAY ALSO LIKE TO VERIFY THE RELEVANT RECORDS FOR COMPLIANCE WITH STATUTORY REQUIREMENTS. CONTRACTOR SHALL ENABLE SUCH FACILITIES TO BHEL / CUSTOMER.

5.8.3
IT IS THE RESPONSIBILITY OF CONTRACTOR TO ARRANGE GATE PASS FOR ALL HIS EMPLOYEES, T&P ETC FOR ENTERING THE PROJECT PREMISES. NECESSARY COORDINATION WITH CUSTOMER OFFICIALS IS THE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTOR TO FOLLOW ALL THE PROCEDURES LAID DOWN BY THE CUSTOMER FOR MAKING GATE PASSES. WHERE PERMITTED, BY CUSTOMER / BHEL, TO WORK BEYOND NORMAL WORKING HOURS, THE CONTRACTOR SHALL ARRANGE NECESSARY WORK PERMITS FOR WORKING BEYOND NORMAL WORKING HOURS.

5.8.4.
CONTRACTOR SHALL PROVIDE AT DIFFERENT ELEVATION SUITABLE ARRANGEMENT FOR URINAL AND DRINKING WATER FACILITY WITH NECESSARY PLUMBING & DISPOSAL ARRANGEMENT INCLUDING CONSTRUCTION OF SEPTIC TANK. THESE INSTALLATIONS SHALL BE MAINTAINED IN HYGIENIC CONDITION AT ALL TIMES.

5.9
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 THEREON SHALL BE RECOVERED FROM THE CONTRACTOR.

5.10 TAXES, DUTIES, LEVIES

5.1

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

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.

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.

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.

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.

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.

5.11
SUBMISSION OF PERIODICAL REPORTS

CONTRACTOR SHALL SUBMIT PERIODICAL REPORTS IN RESPECT OF FOLLOWING ASPECTS OF OPERATION:

1) CONSUMPTION OF WELDING ELECTRODES AND GASES
2) CONSUMPTION OF CONSTRUCTION POWER
3) MANPOWER REPORTS-DAILY
4) PROGRESS REPORTS – DAILY & PERIODICALLY
5) FIELD CALIBRATION REPORTS
6) CALIBRATION REPORTS OF INSTRUMENTS
7) ACCIDENT REPORT (IF ANY) WITHIN 24 HRS.
8) SAFETY REPORTS AS SPECIFIED IN SECTION-9 OF SCC

BHEL AT SITE WILL INFORM FORMATS FOR THESE REPORTS.

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SECTION-6
SPECIAL CONDITIONS OF CONTRACT

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

6.1 SUPERVISORY STAFF AND LABOUR

6.1.1
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 APPENDIX-V. ALSO THE ACTUAL DEPLOYMENT WILL BE SO AS TO SATISFY THE ERECTION AND COMMISSIONING TARGETS SET BY BHEL.

6.1.2
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.

6.1.3
CONTRACTOR SHALL DEPLOY ONLY QUALIFIED AND EXPERIENCED ENGINEERS/ SUPERVISORS. THEY SHALL HAVE PROFESSIONAL APPROACH IN EXECUTING THE WORK.

6.1.4
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.

6.1.5
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.

6.1.6
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.

6.2 INDUSTRIAL RELATIONS AND LABOUR LAWS

6.2.1
AN INDUSTRIAL RELATIONS SUPERVISOR SHALL COORDINATE FOR THE IMPLEMENTATION OF LOCAL LABOUR LAWS, MAINTENANCE OF RECORDS AS REQUIRED BY CONTRACT LABOUR (REGULATION AND ABOLITION ACT) AND ALSO COORDINATE WITH THE LOCAL LABOUR AUTHORITIES. CONTRACTOR HAS TO ENSURE MINIMUM WAGES PAYMENT TO THEIR LABOURS AS PER THE RULE OF THE STATE AND THEY HAVE TO PRODUCE DOCUMENTARY EVIDENCE TO THAT EFFECT TO BHEL.

6.2.2
CONTRACTOR SHALL PROVIDE THE NAMES AND DETAILS OF ENGINEER/ SUPERVISORS AT THE TIME OF MOBILIZATION TO BHEL AS PER THE PROPOSED ORGANIZATION CHART.

6.2.3
IN CASE AT ANY TIME THE CONTRACTOR IS NOT IN A POSITION TO DEPLOY THE REQUIRED ENGINEERS/SUPERVISORS DUE TO ANY REASON, BHEL SHALL HAVE THE OPTION TO DEPLOY THEIR ENGINEERS/SUPERVISORS. THE EXPENDITURE INCURRED WITH OVERHEADS ON THIS ACCOUNT WILL BE RECOVERED FROM THE CONTRACTOR'S BILLS.

6.2.4
THE CONTRACTOR'S SUPERVISORY STAFF SHALL EXECUTE THE WORK IN THE MOST SUBSTANTIAL AND WORKMANLIKE MANNER IN THE STIPULATED TIME. ACCURACY OF WORK AND AESTHETIC FINISH ARE ESSENTIAL PART OF THIS CONTRACT. THEY SHALL BE RESPONSIBLE TO ENSURE THAT THE ASSEMBLY AND WORKMANSHIP CONFORM TO DIMENSIONS AND TOLERANCES GIVEN IN THE DRAWINGS/ INSTRUCTIONS GIVEN BY BHEL ENGINEER FROM TIME TO TIME.

6.2.5
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 AND IN GENERAL, 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.

6.2.6
CONTRACTOR WILL DEDUCT THE NECESSARY AMOUNT FROM HIS EMPLOYEES TOWARDS PROVIDENT FUND AND CONTRIBUTE THE EQUAL AMOUNT AS PER GOVERNMENT OF INDIA RULES. THIS AMOUNT WILL BE DEPOSITED REGULARLY TO THE PROVIDENT FUND COMMISSIONER AND AN ACCOUNT CODE OBTAINED. CONTRACTOR SHALL SUBMIT THE ABOVE ACCOUNT CODE DULY CERTIFIED BY PF COMMISSIONER TO BHEL PROJECT IN-CHARGE. ALSO ALL OTHER EMPLOYEES' BENEFITS ARE TO BE BORNE BY THE CONTRACTOR AS PER STATUTORY LAWS.

6.2.7
THE CONTRACTOR SHALL OBTAIN INDEPENDENT LABOUR LICENSE UNDER THE CONTRACT LABOUR (REGULATION AND ABOLITION) ACT FROM THE CONCERNED AUTHORITIES BASED ON THE CERTIFICATE (FORM-V) ISSUED BY THE PRINCIPAL EMPLOYER/CUSTOMER.

6.2.8
THE CONTRACTOR SHALL PAY FOR ALL TAXES, FEES, LICENSE CHARGES, LOCAL BODY CLEARANCE, DUTIES, TOOLS, ROYALTY, COMMISSIONS AND OTHER

CHARGES, GATE PASSES WHICH MAY BE LEVIABLE ON ACCOUNT OF HIS OPERATION IN EXECUTING THE CONTRACT. IN CASE BHEL IS FORCED TO MAKE ANY SUCH PAYMENTS, BHEL SHALL HAVE THE RIGHT TO RECOVER THE SAME FROM CONTRACTOR'S BILLS.

6.3
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 FROM TIME TO TIME:

6.3.1 OVERALL PLANNING, MONITORING & CONTROL
6.3.2 QUALITY CONTROL AND QUALITY ASSURANCE
6.3.3 MATERIALS MANAGEMENT
6.3.4 SAFETY, FIRE & SECURITY
6.3.5 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
WELDER'S TEST MATERIALS (ONLY TUBES & PIPES):
BHEL WILL ONLY PROVIDE THE TUBE & PIPE PIECES IN RANDOM SIZES FREE OF CHARGES FOR PREPARATION OF TEST COUPONS FOR CONDUCTING THE SITE QUALIFICATION TEST OF HP/ IBR WELDERS. CONTRACTOR SHALL ARRANGE ON HIS OWN ARRANGE OTHER MATERIALS SUCH AS PLATES, TUBES, PIPES ETC FOR QUALIFICATION OF OTHER WELDERS. CONTRACTOR SHALL PREPARE THE REQUIRED TEST COUPONS. ALL COST IN QUALIFICATION OF HIS WELDERS SHALL BE BORNE BY THE CONTRACTOR.

7.2
FILLER WIRE FOR TIG WELDING
REFER SECTION-5 IN THIS REGARD.

7.3
EQUIPMENTS – TOOLS & PLANTS
BHEL WILL PROVIDE MAKE AVAILABLE T&P LISTED VIDE THE RELEVANT APPENDIX HEREIN FREE OF CHARGE. CONTRACTOR SHALL ENSURE THESE ARE MAINTAINED IN WORKING CONDITION DURING THEIR DEPLOYMENT FOR THE WORK AND WHILE RETUNING THE SAME. BHEL RESERVES THE RIGHT TO TAKE PENAL ACTION AS DEEMED FIT IN THE EVENT OF DAMAGES TO THESE ON ACCOUNT OF CONTRACTOR. FURTHER DETAILS ARE AS UNDER:

7.3.1
CRANES TO BE PROVIDED BY BHEL
7.3.1.1
BHEL SHALL NOT PROVIDE ANY CRANE OR TRANSPORTATION ARRANGEMENT FOR THIS WORK. CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE CRANES AND OTHER SUIATBLE ARRANGEMENTS AS INDICATED IN RELEVENT APPENDIX AND REQUIRED FOR COMPLETION OF WORK IN CONTRACTOR'S SCOPE.

~~7.3.1.2~~
~~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.~~

~~7.3.1.3~~
~~ANY BOOM REDUCTION/ EXTENSION SHALL BE THE CONTRACTOR'S RESPONSIBILITY.~~

~~7.3.1.4~~
~~THE DAY-TO-DAY UPKEEP AND RUNNING MAINTENANCE LIKE FILLING / TOPPING UP OF LUBRICANTS, ETC, OF BHEL T & P SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. SPARES IF ANY, REQUIRED IN NORMAL COURSE WILL BE PROVIDED BY BHEL. MAJOR BREAKDOWNS WILL BE ATTENDED TO BY BHEL.~~

7.4 OTHER T&P

7.4.1
SPECIAL TOOLS WHICH ARE SUPPLIED BY BHEL AS PART OF ERECTION AND/OR 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 IN GOOD WORKING ORDER AFTER THE COMPLETION OF THE SPECIFIC ACTIVITY, FOR WHICH THE TOOLS WERE SPARED.

7.4.3
LUBRICANTS LIKE HYDRAULIC OIL, GEAR OIL AND GREASE FOR BHEL'S T&P WILL BE PROVIDED BY BHEL FREE OF CHARGE. ALL OTHER CONSUMABLES LIKE COTTON WASTE ETC SHALL BE IN THE CONTRACTOR'S SCOPE.

7.4.6
THE CONTRACTOR MUST NOT USE THESE EQUIPMENTS FOR ANY PURPOSE OTHER THAN WHAT THEY ARE INTENDED FOR.

7.4.7
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.

7.4.8
REQUIRED TEMPORARY STRUCTURAL STEEL, PIPES & FITTINGS, VALVES, CHEMICAL CIRCULATION PUMPS FOR CONDUCTANCE OF HYDRAULIC TEST, CHEMICAL CLEANING / STEAM BLOWING / OIL FLUSHING / ACID CLEANING ETC. SHALL BE PROVIDED BY BHEL.

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

7.5.1
ALL LUBRICANTS AND CHEMICALS REQUIRED FOR TESTING, PRESERVATION, CHEMICAL CLEANING / ACID CLEANING, OIL FLUSHING, AND THE LUBRICANTS FOR TRIAL RUNS OF THE EQUIPMENTS WILL BE SUPPLIED BY BHEL AS FREE ISSUE. BHEL WILL PROVIDE PAINTS WITH PRIMER & THINNER FOR FINAL PAINTING.

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 QUALITY CONTROL PROCEDURE/CODES AND OTHER STATUTORY PROVISIONS AND AS PER BHEL ENGINEER'S INSTRUCTIONS.

8.2 PREPARATION OF QUALITY ASSURANCE LOG SHEETS AND PROTOCOLS WITH '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 BHEL SHALL BE MADE PRIOR TO INSTALLATION FOR CORRECTNESS OF FOUNDATIONS, MATERIALS, PROCEDURES, AT EACH STAGE OF INSTALLATION, GENERALLY AS PER THE REQUIREMENT OF 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 LOGBOOK 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/ CENTERING/LEVELING READINGS AND INSPECTION DETAILS OF VARIOUS EQUIPMENTS, STRUCTURES, PIPING, AND OTHERS.

ALL THE IMPORTANT MEASUREMENTS LIKE PRE-ASSEMBLY RECORDS, FOUNDATION LEVELS, EQUIPMENT ALIGNMENT, ETC SHALL BE RECORDED IN THE DAILY LOGBOOK WITH SKETCHES BASED ON BHEL DRAWINGS INDICATING READINGS/ MEASUREMENTS TAKEN AND SIGNED BY BHEL CONTRACTOR'S REPRESENTATIVES.

WELDING DETAILS LIKE SERIAL NUMBER OF WELD JOINTS, WELDERS NAME, DATE OF WELDING, DETAILS OF REPAIR, HEAT TREATMENT ETC SHALL BE DOCUMENTED IN WELDING LOG AS PER BHEL ENGINEER'S INSTRUCTIONS.

8.4 ALL THE ELECTRICAL/MECHANICAL MEASURING AND MONITORING DEVICES/ GAUGES, FEELER GAUGES, HEIGHT GAUGES, DIAL GAUGES, MICROMETERS, PRECISION LEVELS, SPIRIT LEVELS, WATER LEVEL MICROMETERS SURFACE PLATES, STRAIGHT EDGES, VERNIER CALIPERS AND ALL OTHER MEASURING INSTRUMENTS SHALL BE PROVIDED BY THE CONTRACTOR FOR CHECKING, LEVELING, ALIGNMENT, CENTERING ETC OF THE ERECTED EQUIPMENTS AT VARIOUS STAGES.

THE INSTRUMENTS/GAUGES/TOOLS ETC PROVIDED SHOULD BE OF BRAND, QUALITY AND ACCURACY, SPECIFIED BY BHEL ENGINEER AND SHOULD HAVE NECESSARY CALIBRATION AND OTHER CERTIFICATES AS PER THE REQUIREMENTS OF BHEL ENGINEER.

8.5 IN THE COURSE OF ERECTION, IT MAY BE NECESSARY TO RE-CHECK OR COUNTER CHECK OR FINALLY CHECK THE WORK WITH INSTRUMENTS RECENTLY CALIBRATED, RECALIBRATED OR OF INSPECTION GRADE GAUGE/TOOLS OR SPECIAL MEASURING INSTRUMENTS. SUCH INSTRUMENTS WHENEVER NECESSARY WILL BE PROVIDED BY BHEL ON SPECIFIC AUTHORIZATION BY BHEL ENGINEER.

8.6 THE INSTRUMENTS MENTIONED IN CLAUSE 8.5 SHALL BE DRAWN BY THE CONTRACTOR FROM BHEL STORES ON THE SPECIFIC AUTHORIZATION AND USE THE SAME ON THE SPECIFIC JOB FOR THE PURPOSE OF INSPECTION/ RECHECKING/COUNTER CHECKING/ FINALLY CHECKING OF THE WORK AND SHALL BE RETURNED TO BHEL STORES IMMEDIATELY ON COMPLETION OF THE INSPECTION.

8.7 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.

8.8 THE WELDER'S PERFORMANCE WILL BE REVIEWED FROM TIME TO TIME AS PER THE BHEL STANDARDS AND ANY WELDER NOT PERFORMING TO THE STANDARDS SET BY BHEL WILL BE REMOVED FROM WORKING. CONTRACTOR SHALL ARRANGE FOR THE ALTERNATE WELDERS IMMEDIATELY.

8.9 ALL THE WELDERS SHALL CARRY IDENTITY CARDS AS PER THE PRO FORMA PRESCRIBED BY BHEL ONLY WELDERS DULY AUTHORIZED BY BHEL SHALL BE ENGAGED ON THE WORK.

8.10 CONTRACTOR SHALL ENSURE SPEEDY ALIGNMENT AND WELDING OF ALL EQUIPMENTS ERECTED BY HIM SOON AFTER PLACEMENT. ALSO ALL ALIGNMENTS, WELDING, NDT TESTS REQUIRED FOR STAGE INSPECTION SHALL BE COMPLETED AS PER THE QUALITY ASSURANCE PROCEDURES.

STAGE INSPECTION BY FES/QA ENGINEERS

APART FROM DAY-TO-DAY INSPECTION BY BHEL ENGINEERS AND KPCL ENGINEERS, STAGE INSPECTION OF EQUIPMENTS AT VARIOUS STAGES OF ERECTION AND COMMISSIONING BY TEAMS OF ENGINEERS FROM FIELD ENGINEERING SERVICES /FIELD QUALITY ASSURANCE GROUPS OF BHEL'S MANUFACTURING UNITS AND COMMISSIONING ENGINEERS FROM TECHNICAL SERVICES OF BHEL MAY ALSO BE CONDUCTED. CONTRACTOR SHALL ARRANGE ALL LABOUR, TOOLS AND TACKLES ETC, FOR SUCH STAGE INSPECTIONS WITHIN THEIR QUOTED RATE.

8.11.1 ANY MODIFICATIONS SUGGESTED BY FES / FQA ENGINEERS TEAM SHALL BE CARRIED OUT. CLAIMS OF CONTRACTOR, IF ANY, SHALL BE DEALT AS PER CLAUSE 13.1 TO 13.8.

8.11.2 ANY MINOR RECTIFICATION OR MINOR REPAIRS OF DEFECTIVE WORK FOUND AT DURING STAGE INSPECTION SHALL BE RECTIFIED FREE OF COST, BY THE CONTRACTOR.

8.11.3 ANY MAJOR RECTIFICATION OR MAJOR REPAIR/MAJOR REWORK OF DEFECTIVE WORK, FOUND OUT DURING STAGE INSPECTION AS PER CLAUSE 8.11, BUT NOT ATTRIBUTABLE TO CONTRACTOR SHALL ALSO BE

CARRIED OUT. CLAIMS OF CONTRACTOR, IF ANY, SHALL BE GOVERNED AS PER CLAUSE 13.1 TO 13.8.

STATUTORY INSPECTION

8.12.1 DURING THE STATUTORY INSPECTION, CONTRACTOR SHALL PROVIDE ALL THE MANPOWER ASSISTANCE AS PER THE REQUIREMENT WITHIN THEIR QUOTED RATE. HOWEVER, ALL OTHER ARRANGEMENTS FOR VISITING OF STATUTORY AUTHORITIES AT SITE INCLUDING FEE ETC SHALL BE BORNE BY BHEL ALSO REFER SECTION 5 IN THIS REGARD.

8.13.0 BHEL, POWER SECTOR- WESTERN REGION (PSWR) HAS ALREADY BEEN ACCREDITED WITH ISO 9002 CERTIFICATION AND AS SUCH THIS WORK IS SUBJECT TO VARIOUS AUDITS TO MEET ISO 9002 REQUIREMENTS. ONE PARTICULAR ASPECT, WHICH NEEDS SPECIAL MENTION, IS ABOUT ARRANGEMENT OF CALIBRATION OF INSTRUMENTS BY THE CONTRACTOR. CONTRACTOR SHALL ENSURE DEPLOYMENT OF RELIABLE AND CALIBRATED MMD (MEASURING AND MONITORING DEVICES). THE MMD SHALL HAVE TEST/CALIBRATION CERTIFICATES FROM AUTHORIZED / GOVERNMENT APPROVED/ ACCREDITED AGENCIES TRACEABLE TO NATIONAL / INTERNATIONAL STANDARDS. RETESTING / RECALIBRATION SHALL ALSO BE ARRANGED AT REGULAR INTERVALS DURING THE PERIOD OF USE AS ADVISED BY BHEL ENGINEER WITHIN THE CONTRACT PRICE.

THE CONTRACTOR WILL ALSO HAVE ALTERNATE ARRANGEMENTS FOR SUCH MMD SO THAT WORK DOES NOT SUFFER WHEN THE PARTICULAR EQUIPMENT/ INSTRUMENT IS SENT FOR RE-CALIBRATION. ALSO IF ANY MMD IS NOT FOUND FIT FOR USE, BHEL SHALL HAVE THE RIGHT TO STOP THE USE OF SUCH ITEM AND INSTRUCT THE CONTRACTOR TO DEPLOY PROPER ITEM AND RECALL I.E. REPEAT THE READINGS TAKEN BY THAT INSTRUMENT, FAILING WHICH BHEL MAY DEPLOY MMDS AND RETAKE THE READINGS AT CONTRACTOR'S COST.

8.14.0 IN ADDITION OF ABOVE, CONTRACTOR SHALL STRICTLY FOLLOW THE STATOTORY RULES & REGULATIONS REQUIREMENTS, SAFETY RULES AND OTHER STATUTORY REQUIREMENTS AS PER CUSTOMER's REQUIREMENT AND INSTRUCTIONS OF BHEL ENGINEER AT SITE. CONTRACTOR SHALL ABIDE BY ALL STATUTORY LAW WHEREIN CHEWING OF PAN, GUTKHA, SMOKING OF BIDI & CIGARATTES IS BANNED AT PUBLIC AND IT HAS BEEN ENFORCED BY STATE GOVERNMENT OF GUJARAT.

8.15.0 CONTRACTOR SHALL HAVE TO OBTAIN THE PERMITS / CLEARANCE FROM FOLLOWING STATOTORY AUTHORITIES AS PER REQUIREMENT OF WORKS WITH ASSISTANEC OF CUSTOMER:

8.15.1 THE CHIEF INSPECTOR OF BOILERS (GUJARAT):- FOR BOILER HRSG & OTHER PRESSURE PARTS INCLUDING PIPES AND VALVES.

8.15.2 THE CHIEF ELECTRICAL INSPECTOR (GUJARAT) : FOR ELECTRICAL WORKS

8.15.3 AIR PORT AUTHORITY OF INDIA : FOR STACK OBSTRUCTION LIGHT / PAINTING

8.15.4 THE CHIEF INSPECTOR OF FACTORIES (GUJARAT : FOR BUILDINGS, PIPE LAYOUT ROUTES, ACID AND OTHER CHEMICAL STORAGE

8.15.5 GUJARAT POLLUTION CONTROL BOARD : FOR STACK EMISSION LEVELS, WATER EFFULENT QUALITY, SOLID WASTES ETC.

8.15.6 ELEVATOR AND LIFT INSPECTOR (GUJARAT): FOR LIFTS, CRANES AND HOISTS.

8.15.7 NAVAL WIRELESS CENTRE FOR FREQUENCY ALLOCATION FOR COMMUNICATION EQUIPMENTS LIKE RADIO, PLCC, REMOTE OPERATED CRANES.

8.16.0 CONTRACTOR SHALL HAVE TO OBTAIN THE PERMITS / CLEARANCE FROM FOLLOWING STATOTORY AUTHORITIES AS PART OF HIS RESPONSIBILITY AND SCOPE OF WORK AS REQUIRED UNDER THIS TENDER SPECIFICATION:

8.16.1 LABOUR COMMISSIONER, GOVT. OF GUJARAT : LICENSE FOR LABOUR COMMISSIONER FOR CONSTRUCTION LABOUR. AND REGISTRATION OF WORKS AND STAFF ETC..

8.16.2 GOVT. OF GUJARAT, HOME DEPTT. : FOR PURPOSE OF BLASTING (IF ANY)

8.16.3 ELECTRICAL INSPECTORATE, GOVT. OF GUJARAT FOR TEMPORARY CONSTRUCTION POWER LINES WITHIN THE POWER PLANT AREA.

8.16.4 INSPECTOR OF WEIGHT AND MEASURES, GOVT. OF GUJARAT : FOR WEIGH BRIDGE AND WEIGH SCALES.

8.16.5 GUJARAT POLLUTION CONTROL BOARD: FOR COLLECTION, STOAREG AND DISPOSAL OF WASTE, SITE CLERANCE, SAFE REPORT AND SAFETY AUDIT.

8.16.6 MUNICIPAL CORPORATION, EXECUTIVE ENGINEER, BUILDING PROPOSAL OR CONCERNED AUTHORITIES :FOR BUILDING PROPOSALS AND LAYOUTS (AS APPLICABLE)

8.16.7 MUNICIPAL CORPORATION, CHIEF FIRE OFFICER OR CONCERNED AUTHORITIES : FOR BUILDING LAYOUT WITH FIRE SAFETY CONCERNS AND RECEIPT OF NO OBJECTION CERTIFICATE.

8.16.8 MUNICIPAL CORPORATION, EXECUTIVE ENGINEER, STORM WATER DRAINAGE DESIGN OR CONCERNED AUTHORITIES : NO OBJECTION CERTIFICATE FOR STORM WATER DRAINAGE DESIGN.

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 ENDEAVOUR OF BHEL AND ALL ITS SUBCONTRACTORS TO MEET AND IMPLEMENT THE REQUIREMENTS BY FOLLOWING THE GUIDELINES ISSUED UNDER ENVIRONMENTAL, OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT (EHS) MANUAL A COPY OF WHICH WILL BE AVAILABLE WITH THE BHEL SITE-IN-CHARGE.

CONTRACTOR SHALL ALSO ENTER INTO A “MEMORANDUM OF UNDERSTANDING” AS GIVEN IN CLAUSE 9.9 IN CASE OF AWARD OF CONTRACT.

9.0
RESPONSIBILITY OF THE CONTRACTOR IN RESPECT OF SAFETY OF MEN, EQUIPMENT, MATERIAL AND ENVIRONMENT.

9.1 THE CONTRACTOR SHALL:

9.1.1
ABIDE BY THE SAFETY REGULATIONS APPLICABLE FOR THE SITE/PROJECT AND IN PARTICULAR AS MENTIONED IN THE BOOKLET “SAFE WORK PRACTICES” ISSUED BY BHEL. CONTRACTORS ARE ALSO TO ENSURE THAT THEIR EMPLOYEES AND WORKMEN USE SAFETY EQUIPMENTS AS STIPULATED IN THE FACTORIES ACT (LATEST REVISION) DURING THE EXECUTION OF THE WORK. FAILURE TO USE SAFETY EQUIPMENT AS REQUIRED BY BHEL ENGINEER WILL BE A SUFFICIENT REASON FOR ISSUANCE OF MEMO, WHICH SHALL BECOME PART OF SAFETY EVALUATION OF THE CONTRACTOR AT THE END OF THE PROJECT. ALSO ALL SITE WORK MAY BE SUSPENDED IF IT IS FOUND THAT THE WORKMEN ARE EMPLOYING UNSAFE WORKING PRACTICE AND ALL THE COSTS/LOSSES INCURRED DUE TO SUSPENSION OF WORK SHALL BE BORNE BY CONTRACTOR. A COMPREHENSIVE LIST OF NATIONAL STANDARDS FROM WHICH THE CONTRACTOR CAN DRAW REFERENCES FOR COMPLYING WITH VARIOUS REQUIREMENTS UNDER THIS SECTION IS GIVEN UNDER 9.10

9.1.2
HOLD BHEL HARMLESS AND INDEMNIFIED FROM AND AGAINST ALL CLAIMS, COST AND CHARGES UNDER WORKMEN’S COMPENSATION ACT 1923 AND 1933 AND ANY AMENDMENT THEREOF AND THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE SAME.

9.1.3
ABIDE BY THE PROCEDURE GOVERNING ENTRY/EXIT OF THE CONTRACTOR’S PERSONNEL WITHIN THE CUSTOMER/CLIENT PREMISES. ALL THE CONTRACTORS EMPLOYEES SHALL BE PERMITTED TO ENTER ONLY ON DISPLAYING OF AUTHORIZED PHOTO PASSES OR ANY OTHER DOCUMENTS AS AUTHORIZED BY THE CUSTOMER/CLIENT.

9.1.4
BE FULLY RESPONSIBLE FOR THE IDENTITY, CONDUCT AND INTEGRITY OF THE PERSONNEL/WORKERS ENGAGED BY THEM FOR CARRYING OUT THE CONTRACT

WORK AND ENSURE THAT NONE OF THEM ARE EVER ENGAGED IN ANY ANTI NATIONAL ACTIVITY

9.1.5
PREPARE A SIGNBOARD GIVING THE FOLLOWING INFORMATION AND DISPLAY IT NEAR WORK SITE:

i) NAME OF CONTRACTOR
ii) NAME OF CONTRACTOR SITE-IN-CHARGE & TELEPHONE NUMBER
iii) JOB DESCRIPTION IN SHORT
iv) DATE OF START OF JOB
v) DATE OF EXPECTED COMPLETION
vi) NAME OF BHEL SITE-IN-CHARGE.

9.1.6
ABIDE BY THE RULES AND REGULATIONS EXISTING DURING THE CONTRACT PERIOD AS APPLICABLE FOR THE CONTRACTORS AT THE PROJECT PREMISES.

9.1.7
OBSERVE THE TIMINGS OF WORK AS ADVISED BY BHEL ENGINEER-IN-CHARGE FOR CARRYING OUT THE CONTRACT WORK.

9.2 SPECIAL CONDITIONS
9.2.1 SAFETY
9.2.1.1 SAFETY PLAN

BEFORE COMMENCING THE WORK, CONTRACTOR SHALL SUBMIT A "SAFETY PLAN" TO THE AUTHORIZED BHEL OFFICIAL. THE SAFETY PLAN SHALL INDICATE IN DETAIL THE MEASURES THAT WOULD BE TAKEN BY THE CONTRACTOR TO ENSURE SAFETY TO MEN, EQUIPMENT, MATERIAL AND ENVIRONMENT DURING EXECUTION OF THE WORK. THE PLAN SHALL TAKE CARE TO SATISFY ALL REQUIREMENTS SPECIFIED HEREUNDER.

THE CONTRACTOR SHALL SUBMIT "SAFETY PLAN" BEFORE START OF WORK. DURING NEGOTIATIONS, BEFORE PLACING OF WORK ORDER AND DURING EXECUTION OF THE CONTRACT, BHEL SHALL HAVE RIGHT TO REVIEW AND SUGGEST MODIFICATIONS IN THE SAFETY PLAN. CONTRACTOR SHALL ABIDE BY BHEL'S DECISION IN THIS RESPECT.

9.2.1.2
THE CONTRACTOR SHALL TAKE ALL NECESSARY SAFETY PRECAUTIONS AND ARRANGE FOR APPROPRIATE APPLIANCES AND/OR AS PER DIRECTION OF BHEL OR IT'S AUTHORIZED PERSON TO PREVENT LOSS OF HUMAN LIVES, INJURIES TO MEN ENGAGED AND DAMAGE TO PROPERTY AND ENVIRONMENT.

9.2.1.3
THE CONTRACTOR SHALL PROVIDE TO HIS WORK FORCE AND ALSO ENSURE THE USE OF PERSONNEL PROTECTION EQUIPMENT (PPE) AS FOUND NECESSARY AND/OR AS DIRECTED AND ADVISED BY BHEL OFFICIALS WITHOUT WHICH PERMISSION IS LIABLE TO BE DENIED.

- SAFETY HELMETS CONFORMING TO IS 2925/1984 (1990)
- SAFETY BELTS CONFORMING TO IS 3521/1989
- SAFETY SHOES CONFORMING TO IS 1989 PART-II /1986(1992)
- EYE AND FACE PROTECTION DEVICES CONFORMING TO IS 2573/1986(1991), IS 6994 (1973), PART-I (1991), IS 8807/1978 (1991), IS 8519/1977(1991).
- OTHER JOB SPECIFIC PPES OF STANDARD ISI MAKE AS MAY BE PRESCRIBED

9.2.1.4

ALL TOOLS, TACKLES, LIFTING APPLIANCES, MATERIAL HANDLING EQUIPMENT, SCAFFOLDS, CRADLES, CAGES, SAFETY NETS, LADDERS, EQUIPMENT, ETC USED BY THE CONTRACTOR SHALL BE OF SAFE DESIGN AND CONSTRUCTION. THESE SHALL BE TESTED AND CERTIFICATE OF FITNESS OBTAINED BEFORE PUTTING THEM TO USE AND FROM TIME TO TIME AS INSTRUCTED BY AUTHORIZED BHEL OFFICIAL WHO SHALL HAVE THE RIGHT TO BAN THE USE OF ANY ITEM FOUND TO BE UNSAFE.

9.2.1.5
ALL ELECTRICAL EQUIPMENT, CONNECTIONS AND WIRING FOR CONSTRUCTION POWER, ITS DISTRIBUTION AND USE SHALL CONFORM TO THE REQUIREMENTS OF INDIAN ELECTRICITY ACT AND RULES. ONLY ELECTRICIANS LICENSED BY THE APPROPRIATE STATUTORY AUTHORITY SHALL BE EMPLOYED BY THE CONTRACTOR TO CARRYOUT ALL TYPES OF ELECTRICAL WORKS. ALL ELECTRICAL APPLIANCES INCLUDING PORTABLE ELECTRIC TOOLS USED BY THE CONTRACTOR SHALL HAVE SAFE PLUGGING SYSTEM TO SOURCE OF POWER AND BE APPROPRIATELY EARTHED.

9.2.1.6
THE CONTRACTOR SHALL NOT USE ANY HAND LAMP ENERGIZED BY ELECTRIC POWER WITH SUPPLY VOLTAGE OF MORE THAN 24 VOLTS. FOR WORK IN CONFINED SPACES, LIGHTING SHALL BE ARRANGED WITH POWER SOURCE OF NOT MORE THAN 24 VOLTS.

9.2.1.7
THE CONTRACTOR SHALL ADOPT ALL FIRE SAFETY MEASURES AS PER RELEVANT INDIAN STANDARDS

9.2.1.8
WHERE IT BECOMES NECESSARY TO PROVIDE AND/OR STORE PETROLEUM PRODUCTS, EXPLOSIVES, CHEMICALS AND LIQUID OR GASEOUS FUEL OR ANY OTHER SUBSTANCE THAT MAY CAUSE FIRE OR EXPLOSION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CARRYING OUT SUCH PROVISIONS AND/OR STORAGE IN ACCORDANCE WITH THE RULES AND REGULATIONS LAID DOWN BY THE RELEVANT GOVERNMENT ACTS, SUCH AS PETROLEUM ACT, EXPLOSIVES ACT, PETROLEUM AND CARBIDES OF CALCIUM MANUAL OF THE CHIEF CONTROLLER OF EXPLOSIVES, GOVERNMENT OF INDIA ETC. THE CONTRACTOR IN ALL SUCH MATTERS SHALL ALSO TAKE PRIOR APPROVAL OF THE AUTHORIZED BHEL OFFICIAL AT THE SITE.

9.2.1.9
PROPER MEANS OF ACCESS MUST BE USED E.G. LADDERS, SCAFFOLDS, PLATFORMS ETC. NO MAKESHIFT ACCESS SUCH AS OIL DRUMS OR PALLETS SHALL BE USED. DESIGN OF THESE WILL BE IN ACCORDANCE WITH RELEVANT STANDARDS AND CERTIFIED BY COMPETENT PERSONS BEFORE USE.

9.2.1.10
TEMPORARY ARRANGEMENTS MADE AT SITE FOR LIFTING , PLATFORMS, APPROACH ACCESS ETC SHOULD BE PROPERLY DESIGNED AND APPROVED BEFORE BEING PUT TO USE.

9.2.1.11
ALL EXCAVATIONS AND OPENINGS MUST BE SECURELY AND ADEQUATELY FENCED/BARRICADED AND WARNING SIGNS ERECTED WHEN CONSIDERED NECESSARY AS PER RELEVANT CODE OF PRACTICE.

9.2.1.12
NO PERSONS SHALL REMOVE GUARDRAILS, COVERS OR PROTECTIVE DEVICES UNLESS AUTHORIZED BY A RESPONSIBLE SUPERVISOR AND ALTERNATIVE PRECAUTIONS HAVE BEEN TAKEN

9.2.1.13
ACCESS WAYS, MEANS OF ESCAPE AND FIRE EXITS SHALL BE CLEARLY MARKED, KEPT CLEAR AND UNOBSTRUCTED AT ALL TIMES

9.2.1.14
ONLY AUTHORIZED PERSONS HOLDING RELEVANT LICENSE WILL DRIVE AND OPERATE SITE PLANT AND EQUIPMENTS E.G. CRANES, DUMPERS, EXCAVATORS, TRANSPORT VEHICLES ETC

9.2.1.15
ONLY AUTHORIZED PERSONNEL ARE ALLOWED TO REPAIR, COMMISSION ELECTRICAL EQUIPMENTS.

9.2.1.16
GAS CYLINDERS SHALL BE HANDLED AND STORED AS PER GAS CYLINDERS RULES AND RELEVANT SAFE WORKING PRACTICES

9.2.1.17
ALL WASTES GENERATED AT SITE SHALL BE SEGREGATED AND COLLECTED IN A DESIGNATED PLACE SO AS TO PREVENT SPILLAGE/CONTAMINATION/SCATTERING AT SITE, UNTIL THE WASTE IS LIFTED FOR DISPOSAL TO DESIGNATED DISPOSAL AREA AS ADVISED BY BHEL OFFICIAL.

9.2.1.18
THE CONTRACTOR SHALL ARRANGE AT HIS COST (WHEREVER NOT SPECIFIED) APPROPRIATE ILLUMINATION AT ALL WORK SPOTS FOR SAFE WORKING WHEN NATURAL DAY LIGHT IS NOT ADEQUATE FOR CLEAR VISIBILITY.

9.2.1.19
THE CONTRACTOR SHALL TRAIN ADEQUATE NUMBER OF WORKERS/SUPERVISORS FOR ADMINISTERING “FIRST AID”. LIST OF COMPETENT FIRST AID ADMINISTERS SHOULD BE PROMINENTLY DISPLAYED.

9.2.1.20
THE CONTRACTOR SHALL DISPLAY AT STRATEGIC PLACES AND IN ADEQUATE NUMBERS THE FOLLOWING IN FLUORESCENT MARKINGS

- EMERGENCY TELEPHONE NUMBERS
- EXIT, WALKWAYS
- SAFE WORKING LOAD CHARTS FOR WIRE ROPES, SLINGS, D SHACKLES ETC
- WARNING SIGNS

9.2.1.21
THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY VIOLATION OF STATUTORY REGULATIONS (LOCAL, STATE OR CENTRAL) AND BHEL INSTRUCTIONS THAT MAY ENDANGER SAFETY OF MEN, EQUIPMENT, MATERIAL AND ENVIRONMENT IN HIS SCOPE OF WORK OR OTHER CONTRACTORS OR AGENCIES. COST OF DAMAGE, IF ANY, TO LIFE AND PROPERTY ARISING OUT OF SUCH VIOLATION OF STATUTORY REGULATIONS AND BHEL INSTRUCTIONS SHALL BE BORNE BY THE CONTRACTOR.

9.2.1.22
IN CASE OF A FATAL OR DISABLING INJURY/ACCIDENT TO ANY PERSON AT CONSTRUCTION SITES DUE TO LAPSES BY THE CONTRACTOR, THE VICTIM AND/OR HIS/HER DEPENDENTS SHALL BE COMPENSATED BY THE CONTRACTOR AS PER STATUTORY REQUIREMENTS. HOWEVER, IF CONSIDERED NECESSARY, BHEL SHALL HAVE THE RIGHT TO IMPOSE APPROPRIATE FINANCIAL PENALTY ON THE CONTRACTOR AND RECOVER THE SAME FROM PAYMENTS DUE TO THE CONTRACTOR FOR SUITABLY COMPENSATING THE VICTIM AND/OR HIS/HER

DEPENDENTS. BEFORE IMPOSING ANY SUCH PENALTY, APPROPRIATE ENQUIRY SHALL BE HELD BY BHEL GIVING OPPORTUNITY TO THE CONTRACTOR TO PRESENT HIS CASE.

9.2.1.23
IN CASE OF ANY DAMAGE TO PROPERTY DUE TO LAPSES BY THE CONTRACTOR, BHEL SHALL HAVE THE RIGHT TO RECOVER COST OF SUCH DAMAGES FROM PAYMENTS DUE TO THE CONTRACTOR AFTER HOLDING AN APPROPRIATE ENQUIRY.

9.2.1.24
IN CASE OF ANY DELAY IN THE COMPLETION OF A JOB DUE TO MISHAPS ATTRIBUTABLE TO LAPSES BY THE CONTRACTOR, BHEL SHALL HAVE THE RIGHT TO RECOVER COST OF SUCH DELAY FROM PAYMENTS DUE TO THE CONTRACTOR AFTER NOTIFYING THE CONTRACTOR SUITABLY AND GIVING HIM OPPORTUNITY TO PRESENT HIS CASE.

9.2.1.25
IF THE CONTRACTOR FAILS TO IMPROVE THE STANDARDS OF SAFETY IN ITS OPERATION TO THE SATISFACTION OF BHEL AFTER BEING GIVEN A REASONABLE OPPORTUNITY TO DO SO, AND/OR IF THE CONTRACTOR FAILS TO TAKE APPROPRIATE SAFETY PRECAUTIONS OR TO PROVIDE NECESSARY SAFETY DEVICES AND EQUIPMENT OR TO CARRY OUT INSTRUCTIONS REGARDING SAFETY ISSUED BY THE AUTHORIZED BHEL OFFICIAL, BHEL SHALL HAVE THE RIGHT TO TAKE CORRECTIVE STEPS AT THE RISK AND COST OF THE CONTRACTOR AFTER GIVING A NOTICE OF NOT LESS THAN SEVEN DAYS INDICATING THE STEPS THAT WOULD BE TAKEN BY BHEL.

9.2.1.26
EMERGENCY RESPONSE

BHEL WILL HAVE AN EMERGENCY RESPONSE PLAN FOR EACH PROJECT SITE IN CONSULTATION WITH THE OWNER AS THE CASE MAY BE, DETAILING THE PROCEDURE FOR MOBILIZATION OF PERSONNEL AND EQUIPMENT, AND DEFINING THE RESPONSIBILITIES OF THE PERSONNEL INDICATED, IN ORDER TO PREPARE FOR ANY EMERGENCY THAT MAY ARISE IN ORDER TO ENSURE THE PRIORITIES OF

- SAFEGUARD OF LIFE
- PROTECT ASSETS UNDER CONSTRUCTION OR NEIGHBOURING
- PROTECT ENVIRONMENT
- RESUMPTION OF NORMAL OPERATIONS AS SOON AS THE EMERGENCY CONDITION IS CALLED OFF

ALL CONTRACTORS SHALL ALSO BE PART OF THE EMERGENCY RESPONSE PLAN AND THE PERSONNEL SO NOMINATED SHALL BE AWARE OF THEIR DUTIES AND RESPONSIBILITIES IN AN EMERGENCY RESPONSE SITUATION.

9.2.1.27
AT LEAST 5% CONTRACTORS SUPERVISORS AND WORKMEN SHALL UNDERGO TRAINING IN ADMINISTERING 'FIRST AID'. THE TRAINED PERSONS SHOULD REPRESENT FOR ALL CATEGORIES OF WORK AND FOR ALL AREAS OF WORK. ADEQUATE NUMBER OF TRAINED PERSONS SHOULD BE AVAILABLE FOR EACH SHIFT. THESE FIRST AIDES SHALL BE INCLUDED IN THE EMERGENCY RESPONSE TEAM. CONTRACTOR EMPLOYEES AND WORKMEN ARE ENCOURAGED TO PARTICIPATE IN FIRST AID TRAINING PROGRAMMES WHENEVER ORGANIZED BY BHEL.

9.2.2 OCCUPATIONAL HEALTH

9.2.2.1
SPECIFIC OCCUPATIONAL HEALTH HAZARDS WILL BE IDENTIFIED THROUGH THE HAZARD EVALUATION PROCESSES IN CONSULTATION WITH BHEL ENGINEERS AND THE NECESSARY PREVENTION/REDUCTION/ELIMINATION METHODS IMPLEMENTED.

9.2.2.2
ALL PERSONNEL WORKING IN AN ACTIVITY WITH A POTENTIAL RISK TO HEALTH SHALL BE MADE AWARE OF ALL THOSE RISKS AND THE ACTIONS THEY MUST TAKE TO REDUCE/CONTROL/ELIMINATE THE RISK

9.2.2.3
SAFETY COORDINATOR SHALL CONDUCT PERIODIC CHECKS TO ENSURE THAT EVERY GROUP OF WORKERS ENGAGED IN SIMILAR ACTIVITIES ARE AWARE OF POTENTIAL RISKS TO HEALTH AND THE ACTIONS REQUIRED TO BE TAKEN TO MITIGATE THE RISK

9.2.2.4
IN ORDER TO PROTECT PERSONNEL FROM ASSOCIATED HEALTH HAZARDS, THE FOLLOWING MAIN AREAS WILL BE FOCUSED

- ISSUE OF APPROVED PERSONNEL PROTECTIVE EQUIPMENT
- VERIFICATION THAT THE PPE ARE ADEQUATE/MAINTAINED AND WORN BY ALL STAFF INVOLVED IN OPERATIONS THAT ARE POTENTIALLY HAZARDOUS TO THEIR HEALTH
- ENSURE THAT THE PERSONNEL DEPLOYED ARE PHYSICALLY FIT FOR THE OPERATION/WORK CONCERNED
- PROVIDE HYGIENIC AND SANITARY WORKING CONDITIONS

9.2.2.5
CONTRACTOR WORKERS EMPLOYEES ENGAGED IN NOISE RISK AREAS SHALL BE ISSUED WITH HEARING PROTECTION AIDS AND THE USE OF THE SAME WILL BE ENFORCED. FURTHER, THESE WORKERS WILL BE EDUCATED ON THE HAZARDS OF NOISE

9.2.2.6
CONTRACTOR WORKERS ENGAGED IN DUST ENVIRONMENT SHALL BE ISSUED WITH NECESSARY DUST PROTECTION AIDS AND THE USE OF THE SAME SHALL BE ENFORCED

9.2.2.7
WORKERS ENGAGED IN EXPOSURE TO BRIGHT LIGHT/RAYS AS IN WELDING OR RADIATION SHALL BE ISSUED WITH EYE PROTECTION DEVICES AND THE USE OF THE SAME SHALL BE ENFORCED

9.2.2.8
ADEQUATE ARRANGEMENTS SHALL BE MADE TO PROVIDE SAFE DRINKING WATER

9.2.2.9
HEALTH MONITORING RECORDS ON AT LEAST SAMPLE BASIS FOR CONTRACTOR EMPLOYEES & WORKMEN SHALL BE MAINTAINED FOR PERSONS ENGAGED IN SPECIFIED CATEGORIES OF WORK. THESE SHALL INCLUDE

- NOISE INDUCED HEARING LOSS
- LUNG FUNCTION TEST
- ERGONOMIC TEST
- EYE TEST FOR WELDERS, GRINDERS, DRIVERS ETC

9.2.3.0 HYGIENE and HOUSEKEEPING

9.2.3.1
GOOD HOUSE KEEPING AND PROPER HYGIENE IS ONE OF THE KEY REQUIREMENTS OF OCCUPATIONAL HEALTH SAFETY AND ENVIRONMENT MANAGEMENT. TOWARDS THIS THE CONTRACTOR SHALL ENCOURAGE HIS WORKERS AND SUPERVISORS TO MAINTAIN CLEANLINESS IN THEIR AREA OF WORK.

9.2.3.2
THE CONTRACTOR SHALL ARRANGE TO PLACE WASTE BINS/CHUTES AT CONVENIENT LOCATIONS FOR THE COLLECTION OF SCRAP AND OTHER WASTES. THE BINS SHALL BE CLEARLY MARKED AND SEGREGATED FOR METAL, NON-METAL, HAZARDOUS AND NON HAZARDOUS WASTES.

9.2.3.3
BHEL MAY TAKE UP APPROPRIATE REMEDIAL MEASURES AT THE COST OF THE CONTRACTORS IF THE CONTRACTORS FAIL IN GOOD HOUSE KEEPING AND IF THERE IS AN IMMINENT RISK OF POLLUTION

9.2.4 ENVIRONMENT MANAGEMENT

9.2.4.1
BHEL HAS A SOUND ENVIRONMENTAL MANAGEMENT SYSTEM, WHICH IS TO BE MAINTAINED AND IMPLEMENTED BY ALL THE CONTRACTORS. THE SYSTEM ALLOWS FOR PROJECT SPECIFIC OBJECTIVES TO BE SET AND DEVELOPED SENSITIVE TO CLIENT REQUIREMENTS, APPLICABLE ENVIRONMENTAL LEGISLATION AND BHEL'S OWN OBJECTIVES AND POLICY. BHEL ENGINEERS WILL ASSESS AND MONITOR THE ENVIRONMENTAL IMPACT OF THEIR WORK AND LAY OUT OBJECTIVES FOR THEIR MINIMIZATION. THE CONTRACTORS SHALL IMPLEMENT THE OBJECTIVES FOR CONTINUAL IMPROVEMENT OF ENVIRONMENTAL PERFORMANCE. BHEL SHALL REGULARLY AUDIT ENVIRONMENTAL IMPACTS AND THEIR IMPROVEMENTS.

9.2.4.2 WASTE MANAGEMENT

9.2.4.3.1
THE OBJECTIVE OF WASTE MANAGEMENT IS TO ENSURE THE SAFE AND RESPONSIBLE DISPOSAL OF WASTE, ENSURING THAT IT IS CORRECTLY DISPOSED OF AND BEING ABLE TO AUDIT THE PROCESS TO ENSURE COMPLIANCE.

9.2.4.3.2
CHEMICAL WASTES IF ANY SHALL BE COLLECTED SEPARATELY AND DISPOSED OF TO BHEL DESIGNATED REFUSE YARD AS PER BHEL ADVICE.

9.2.4.3.3
NO DANGEROUS CHEMICALS, NOXIOUS WASTE PRODUCTS OR MATERIALS WILL BE DISPOSED OFF ON OR OFF SITE WITHOUT APPROVAL OBTAINED THROUGH BHEL.

9.2.4.3.4
ALL DISPOSAL OF WASTES GENERATED DURING CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL RELEVANT LEGISLATION.

9.2.4.3.5
ACID AND ALKALI CLEANING WASTES SHALL BE NEUTRALIZED TO ACCEPTABLE NORMS BEFORE DISPOSAL TO THE DESIGNATED AREA.

9.2.4.3.6
ALL NECESSARY MEASURES SHALL BE TAKEN TO ENSURE SAFE COLLECTION AND DISPOSAL OF WASTE OILS. IN PARTICULAR TO ENSURE THE PREVENTION OF

THEIR DISCHARGE INTO SURFACE WATERS, GROUND WATERS, COASTAL WATERS OR DRAINAGES

9.3 SUPERVISION

9.3.1

CONTRACTOR MUST PROVIDE AT LEAST ONE FULL TIME ON SITE SAFETY COORDINATOR WHEN THE MANPOWER ENGAGED IS IN EXCESS OF 50 FOR THE CONTRACT ACTIVITIES IN THE PREMISES. IF THE MANPOWER IS LESS THAN 50, THE ON SITE SAFETY COORDINATION RESPONSIBILITIES SHALL BE ASSUMED BY ANY ONE OF THE CONTRACTOR'S OTHER SUPERVISORY STAFF; HOWEVER IN BOTH THE CASES, THE CONTRACTOR MUST SPECIFY IN WRITING THE NAME OF SUCH PERSONS TO THE BHEL ENGINEER IN CHARGE.

9.3.2

CONTRACTOR'S SAFETY COORDINATOR OR HIS SUPERVISOR RESPONSIBLE FOR SAFETY AS THE CASE MAY BE SHALL CONDUCT AT HIS WORK SITE, AND DOCUMENT FORMAL SAFETY INSPECTION AND AUDITS AT LEAST ONCE IN A WEEK. SUCH DOCUMENTS ARE TO BE SUBMITTED TO BHEL ENGINEER IN CHARGE FOR HIS REVIEW AND RECORD.

CONTRACTOR, SUPERVISOR MUST ATTEND ALL SCHEDULE SAFETY MEETINGS AS WOULD BE INTIMATED TO HIM BY THE BHEL ENGINEER IN CHARGE.

9.3.3

BEFORE STARTING WORK UNDER ANY CONTRACT, THE CONTRACTOR MUST ENSURE THAT A JOB SPECIFIC SAFETY PROCEDURES/FIELD PRACTICES AS REQUIRED OVER AND ABOVE THE SAFETY PERMIT CONDITIONS ARE PREPARED AND FOLLOWED .HE SHOULD ALSO ENSURE THAT ALL SUPERVISORS AND WORKERS INVOLVED UNDERSTAND AND FOLLOW THIS PROCEDURES /FIELD PRACTICES.

9.3.4

CONTRACTOR MUST ENSURE THAT IN HIS WORK SITE APPROPRIATE DISPLAY BOARDS ARE PUT DISPLAYING SIGNS FOR SITE SAFETY, POTENTIAL HAZARDS AND PRECAUTIONS REQUIRED.

9.4.0 **TRAINING & AWARENESS**

9.4.1

CONTRACTOR SHALL DEPLOY EXPERIENCED SUPERVISORS AND OTHER MANPOWER WHO ARE WELL CONVERSANT WITH THE SAFETY AND ENVIRONMENT REGULATIONS OF THE PROJECT. THE ELECTRICIANS TO BE DEPLOYED ON THE JOB SHOULD HAVE WIREMAN LICENSE.

9.4.2

ALL SUPERVISORS & WORKMEN OF THE CONTRACTOR SHALL UNDERGO FIRE SAFETY TRAINING/ DEMONSTRATION WHENEVER ARRANGED BY BHEL WITH THE HELP OF EITHER CUSTOMER'S FIRE AND SAFETY DEPARTMENT OR OUTSIDE FACULTY SO AS TO ACQUIRE KNOWLEDGE OF FIRE PREVENTION AND ALSO TO BE ABLE TO MAKE USE OF APPROPRIATE FIRE EXTINGUISHERS.

9.4.3

CONTRACTOR MUST FAMILIARIZE HIMSELF FROM BHEL ENGINEER IN CHARGE ABOUT ALL KNOWN POTENTIAL FIRE, EXPLOSION OR TOXIC RELEASE HAZARDS RELATED TO THE CONTRACT. HE IN TURN WILL ENSURE THAT SAME INFORMATION HAS BEEN PASSED TO THE SUPERVISORS AND WORKMEN.

9.4.4

CONTRACTOR MUST ENSURE THAT ALL HIS SUPERVISORS ARE PROPERLY TRAINED AND EACH EMPLOYEE HAS RECEIVED AND UNDERSTOOD FROM HIS SUPERVISOR NECESSARY TRAINING AND BRIEFING ABOUT THE SAFETY REQUIREMENT. NECESSARY DOCUMENT AS A MEANS TO VERIFY THAT EMPLOYEES HAVE UNDERSTOOD THE TRAINING IS TO BE MAINTAINED.

9.4.5
THE CONTRACTOR SUPERVISORS SHALL ALSO GIVE A SMALL SAFETY BRIEFING TO ALL THE WORKMEN UNDER HIS CHARGE BEFORE UNDERTAKING ANY NEW WORK AND SPECIALLY UNDERSTAND THE SAFETY REQUIREMENTS THAT ARE MANDATORY

9.5.0 **REPORTING**

9.5.1
THE CONTRACTOR SHALL SUBMIT REPORT OF ALL ACCIDENTS, FIRES AND PROPERTY DAMAGE, DANGEROUS OCCURRENCES TO THE AUTHORIZED BHEL OFFICIAL IMMEDIATELY AFTER SUCH OCCURRENCE BUT IN ANY CASE NOT LATER THAN TWELVE HOURS OF THE OCCURRENCE. SUCH REPORT SHALL BE FURNISHED IN THE MANNER PRESCRIBED BY BHEL AND ALSO TO MEET STATUTORY REQUIREMENT.

9.5.2
ANY INJURY SUSTAINED BY ANY OF THE CONTRACTOR'S EMPLOYEES WITHIN THE PROJECT PREMISES MUST BE REPORTED TO BHEL SUPERVISOR AND FIRST AID SHOULD BE IMMEDIATELY ADMINISTERED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING AND MAINTAINING PROPER RECORDS OF ACCIDENTS TO HIS PERSONNEL.

9.5.3
CONTRACTOR MUST ARRANGE TO IMMEDIATELY INVESTIGATE, PROPERLY DOCUMENT AND REPORT ANY INJURY, ACCIDENT OR NEAR MISS INVOLVING ANY OF HIS EMPLOYEES AND TAKE APPROPRIATE FOLLOW UP ACTION. HE MUST FURNISH WITHIN 12 HOURS OF THE INCIDENT A WRITTEN REPORT TO BHEL ENGINEER IN CHARGE AND THE SAFETY SECTION.

9.5.4
ACCORDING TO THE FACTORY ACT AND THE EMPLOYEES STATE INSURANCE ACT & REGULATION, ANY PERSON SUSTAINING ANY INJURY WITHIN THE PROJECT PREMISES AND ABSENTING HIMSELF FROM WORK FOR MORE THAN 46 HOURS, HIS ACCIDENT REPORT HAS TO BE SENT TO THE RESPECTIVE GOVERNMENT AUTHORITIES. THEREFORE CONTRACTOR SHALL INFORM THE OWNER'S REPRESENTATIVE SUCH MATTER IMMEDIATELY FOR THEIR NEEDFUL ACTION.

9.5.5
IN ADDITION, CONTRACTOR SHALL SUBMIT PERIODIC REPORTS ON SAFETY TO THE AUTHORISED BHEL OFFICIAL FROM TIME TO TIME AS PRESCRIBED.

9.5.6
BEFORE COMMENCING THE WORK, THE CONTRACTOR SHALL APPOINT/NOMINATE A RESPONSIBLE OFFICER TO SUPERVISE IMPLEMENTATION OF ALL SAFETY MEASURES AND LIAISON WITH HIS COUNTERPART OF BHEL.

9.6 AUDIT REVIEW AND INSPECTION

9.6.1
BHEL SHALL CONDUCT AUDIT ON THE CONTRACTOR PERFORMANCE AND COMPLIANCE WITH THE PROJECT SPECIFIC REQUIREMENTS OF THE ENVIRONMENT AND OCCUPATIONAL HEALTH & SAFETY MANAGEMENT SYSTEMS. THE PROGRAMME OF AUDIT SHALL COVER ALL ACTIVITIES UNDER THE CONTRACT BUT WILL FOCUS PARTICULARLY ON HIGH-RISK ACTIVITIES. THE CONSTRUCTION MANAGER SHALL DECIDE THE SCHEDULE OF AUDIT. THE AUDIT FINDINGS SHALL BE COMMUNICATED TO THE CONTRACTORS AND NECESSARY REMEDIAL ACTION AS ADVISED BY BHEL ENGINEERS SHALL BE UNDER TAKEN WITHIN THE STIPULATED TIME.

9.6.2
INSPECTIONS SHALL BE CARRIED OUT REGULARLY BY THE CONTRACTORS AND BY BHEL ENGINEERS ON ACTIVITIES, FACILITIES, EQUIPMENT, AND DOCUMENTATION, TO COVER THE FOLLOWING ASPECTS.

- COMPLIANCE WITH PROCEDURES AND SYSTEMS
- AVAILABILITY, CONDITION AND USE OF PPE
- CONDITION OF MAINTENANCE TOOLS, EQUIPMENTS, FACILITIES
- AVAILABILITY OF FIRE FIGHTING EQUIPMENTS AND ITS CONDITION
- USE OF FIRE FIGHTING EQUIPMENTS AND FIRST AID KIT
- AWARENESS OF OCCUPATIONAL HEALTH HAZARD
- AWARENESS OF SAFE WORKING PRACTICES
- PRESENCE OF QUALITY SUPERVISION
- HOUSEKEEPING

THE SAFETY COORDINATOR SHALL VISIT AND INSPECT WORK SITES DAILY. ALL UNSAFE ACTS, UNSAFE CONDITIONS THAT HAVE IMMINENT POTENTIAL FOR CAUSING HARM/INJURY/DAMAGE WILL BE IMMEDIATELY CORRECTED. HE SHALL MAINTAIN A DAILY LOGBOOK GIVING DETAILS OF UNSAFE ACTS OR CONDITIONS OBSERVED AND THE CORRECTIVE ACTION TAKEN AND RECOMMENDATIONS FOR PREVENTING RECURRENCE. ADEQUACY OF CORRECTIVE ACTIONS WILL BE VERIFIED

THE CONTRACTOR SHALL TAKE REMEDIAL MEASURES AS PER THE FINDINGS OF EACH INSPECTION
BESIDES THE ABOVE, THE CONTRACTOR SHALL BE REQUIRED TO CARRY OUT THE FOLLOWING INSPECTIONS

SL NO	EQUIPMENT	SCOPE OF INSPECTION	INSPECTION BY	SCHEDULE
1	HAND TOOLS	TO IDENTIFY UNSAFE/DEFECTIVE TOOL	USER	DAILY
2	POWER TOOLS	TO IDENTIFY UNSAFE/DEFECTIVE TOOL	USER	DAILY
3	FIRE EXTINGUISHERS	TO CHECK PRESSURE AND ANY DEFECT	USER / SAFETY COORDINATOR	DAILY EVERY MONTH
4	LIFTING EQUIPMENT/TACKLES	TO CHECK FOR DEFECTS AND EFFICACY OF BRAKES	USER THIRD PARTY	DAILY EVERY YEAR
5	PPE	TO CHECK FOR DEFECTS	USER	DAILY

9.7 <u>NON COMPLIANCE</u>:-

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 **<u>FOR EVERY INSTANCE OF VIOLATION NOTICED</u>**:

SL. NO	INSTANCE OF VIOLATION	FINE (IN RS)
01	NOT WEARING SAFETY HELMET	50/-
02.	NOT WEARING SAFETY BELT	100/-
03.	GRINDING WITHOUT GOGGLES	50/-
04.	NOT USING 24 V SUPPLY FOR INTERNAL WORK	500/-
05.	ELECTRICAL PLUGS NOT USED FOR HAND MACHINE	100/-
06.	NOT SLINGING PROPERTY	200/-

SL. NO	INSTANCE OF VIOLATION	FINE (IN RS)
07.	USING DAMAGED SLING	200/-
08.	LIFTING CYLINDERS WITHOUT CAGE	500/-
09.	NOT USING PROPER WELDING CABLE WITH LOT OF JOINTS AND NOT INSULATED PROPERTY.	200/-
10.	NOT REMOVING SMALL SCRAP FROM PLATFORMS	200/-
11.	GAS CUTTING WITHOUT TAKING PROPER PRECAUTION OR NOT USING SHEET BELOW GAS CUTTING	200/-
12.	NOT MAINTAINING ELECTRIC WINCHES WHICH ARE OPERATED DANGEROUSLY	500/-
13.	IMPROPER EARTHING OF ELECTRICAL T&P	500/-
	MAJOR ACCIDENT OR ACCIDENTS CAUSING PARTIAL LOSS OF EARNING TO THE VICTIM	50,000/- PER VICTIM
14	FATAL ACCIDENT OR ACCIDENTS CAUSING PERMANENT LOSS OF EARNING TO THE VICTIM	1,00,000/- PER VICTIM

ANY OTHER NON-CONFORMITY NOTICED NOT LISTED ABOVE WILL ALSO BE FINED AS DEEMED FIT BY BHEL. THE DECISION OF BHEL ENGINEER IS FINAL ON THE ABOVE. THE AMOUNT WILL BE DEDUCTED FROM RUNNING BILLS OF THE CONTRACTOR. THE AMOUNT COLLECTED ABOVE WILL BE UTILISED FOR GIVING AWARD TO THE EMPLOYEES WHO COULD AVOID ACCIDENT BY FOLLOWING SAFETY RULES. ALSO THE AMOUNT WILL BE SPENT FOR PURCHASING THE SAFETY APPLIANCES AND SUPPORTING THE SAFETY ACTIVITY AT SITE.

9.8

CITATION:

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

9.9

MEMORANDUM OF UNDERSTANDING

AFTER AWARD OF WORK, CONTRACTORS ARE REQUIRED TO ENTER INTO A MEMORANDUM OF UNDERSTANDING AS GIVEN BELOW:

MEMORANDUM OF UNDERSTANDING

BHEL, PSWR IS COMMITTED TO HEALTH, SAFETY AND ENVIRONMENT POLICY (EHS POLICY) AS GIVEN IN THE BOOKLET TITLED “SAFE WORKING PRACTICES” ISSUED TO ALL CONTRACTORS.

M/S _____ DO HEREBY ALSO COMMIT TO THE SAME EHS POLICY WHILE EXECUTING THE CONTRACT NUMBER _____

M/S _____ SHALL ENSURE THAT SAFE WORK PRACTICES NOT LIMITED TO THE ABOVE BOOKLET ARE FOLLOWED BY ALL CONSTRUCTION WORKERS AND SUPERVISORS. SPIRIT AND CONTENT THEREIN SHALL BE REACHED TO ALL WORKERS AND SUPERVISORS FOR COMPLIANCE.

BHEL WILL BE CARRYING OUT EHS AUDITS TWICE A YEAR AND M/S _____ SHALL ENSURE TO CLOSE ANY NON-CONFORMITY OBSERVED/REPORTED WITHIN FIFTEEN DAYS.

SIGNED BY AUTHORIZED REPRESENTATIVE OF M/S----------

NAME :

PLACE & DATE :

9.10

COMPREHENSIVE LIST OF NATIONAL STANDARDS FOR REFERENCE AND USE WHEREVER APPLICABLE IN THE EXECUTION OF CIVIL, ERECTION AND COMMISSIONING CONTRACTS.

IS No	YEAR	Amd upto	DESCRIPTION
IS 10204	1982		PORTABLE FIRE EXTINGUISHERS MECHANICAL FOAM TYPE
IS 10245	1994		SPECIFICATION FOR BREATHING APPARATUS
IS 10291	1982		SAFETY CODE FOR DRESS DRIVERS IN CIVIL ENGINEERING WORKS
IS 10658	1983		HIGHER CAPACITY DRY POWDER FIRE EXTINGUISHERS (TROLLEY MOUNTED)
IS 10662	1992		COLOUR TELEVISION
IS 10667	1983		GUIDE FOR SELECTION OF INDUSTRIAL SAFETY EQUIPMENT FOR PROTECTION OF FOOT AND LEG
IS 11037	1984		ELECTRONIC FAN REGULATORS
IS 11057	1984		INDUSTRIAL SAFETY NETS
IS 11451	1998		RECOMMENDATION FOR SAFETY AND HEALTH REQUIREMENT RELATING TO OCCUPATION EXPOSURE TO ASBESTOS
IS 1169	1967		PEDESTAL FANS
IS 1179	1967		SPECIFICATION FOR EQUIPMENT FOR EYE AND FACE PROTECTION DURING WELDING
IS 11833	1986		DRY POWDER FIRE EXTINGUISHERS FOR METAL FIRES
IS 11972	1987		CODE OF PRACTICE FOR SAFETY PRECAUTION TO BE TAKEN WHEN ENTERING A SEWARAGE SYSTEM
IS 1287	1986		ELECTRIC TOASTER
IS 13063	1991		STRUCTURAL SAFETY OF BUILDINGS ON SHALLOW FOUNDATIONS ON ROCKS
IS 13385	1992		SPECIFICATIONS FOR FIRE EXTINGUISHERS 50 LITRE WHEEL MOUNTED WATER TYPE (GAS CARTRIDGES)
IS 13386	1992		SPECIFICATIONS FOR FIRE EXTINGUISHERS 50 LITRE MECHANICAL FOAM TYPE
IS 13415	1992		CODE OF SAFETY FOR PROTECTIVE BARRIERS IN AND AROUND BUILDINGS
IS 13416	1992		RECOMMENDATIONS FOR PREVENTIVE MEASURES AGAINST HAZARDS AT WORKING PLACE PART 1 TO PART 5
IS 13430	1992		CODE OF PRACTICE FOR SAFETY DURING ADDITIONAL CONSTRUCTION AND ALTERATION TO

IS No	YEAR	Amd upto	DESCRIPTION
			EXISTING BUILDINGS
IS 13849	1993		PORTABLE FIRE EXTINGUISHERS DRY POWDER TYPE (CONSTANT PRESSURE)
IS 1446	1985		CLASSIFICATION OF DANGEROUS GOODS (FIRST REVISION)
IS 1476	1979		REFRIGERATORS
IS 1641	1988		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS (GENERAL): GENERAL PRINCIPLES OF FIRE GRADING AND CLASSIFICATION
IS 1642	1989		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS- DETAILS OF CONSTRUCTION
IS 1643	1988		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS (GENERAL): EXPOSURE HAZARD
IS 1646	1997		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS (GENERAL): ELECTRICAL INSTALLATIONS
IS 1904	1986		CODE OF PRACTICE FOR DESIGN AND CONSTRUCTION OF FOUNDATIONS IN SOIL
IS 1905	1987		STRUCTURAL SAFETY OF BUILDINGS MASONARY WALLS
IS 2082	1985		ELECTRICAL GEYSERS
IS 2171	1985		PORTABLE FIRE EXTINGUISHERS DRY POWDER TYPE (CARTRIDGE)
IS 2309	1989		PRACTICE FOR THE PROTECTION OF BUILDINGS AND ALLIED BUILDINGS AGAINST LIGHTENING
IS 2312	1967		EXHAUST FANS
IS 2361	1994		SPECIFICATION FOR BUILDING GRIPS - FIRST REVISION
IS 2418	1977		TUBULAR FLUORSCENT LAMPS IS 2418 (FT-1)
IS 2750	1964		STEEL SCAFFOLDINGS
IS 2762	1964		SAFE WORKING LOADS IN KGS FOR WIRE ROPE SLINGS
IS 2878	1986		FIRE EXTINGUISHERS CARBON DIOXIDE TYPE (PORTABLE AND TROLLEY MOUNTED)
IS 2925	1984		SPECIFICATION FOR INDUSTRIAL SAFETY HELMETS
IS 3016	1982		CODE OF PRACTICE FOR FIRE PRECAUTIONS IN WELDING AND CUTTING OPERATIONS- FIRST REVISION
IS 3315	1974		DESERT COOLERS
IS 3521	1989		INDUSTRIAL SAFETY BELTS AND HARNESS
IS 368	1983		IMMERSION WATER HEATERS
IS 3696	1991		SAFETY CODE OF SCAFFOLDS AND LADDERS PART 1 TO 2
IS 3737	1996		LEATHER SAFETY BOOTS FOR WORKERS IN HEAVY METAL INDUSTRIES
IS 374	1979		CEILING FANS INCLUDING REGULATORS
IS 3764	1992		EXCAVATION WORK - CODE OF SAFETY
IS 3786	1983		METHOD FOR COMPUTATION OF FREQUENCY AND SEVERITY RATES FOR INDUSTRIAL INJURIES AND CLASSIFICATION OF INDUSTRIAL ACCIDENTS
IS 3935	1966		CODE OF PRACTICE FOR COMPOSITE CONSTRUCTION

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

IS No	YEAR	Amd upto	DESCRIPTION
IS 8095	1976		ACCIDENTS PREVENTION TAGS
IS 818	1968	1997	CODE OF PRACTICE FOR SAFETY AND HEALTH REQUIREMENTS IN ELECTRIC AND GAS WELDING, AND CUTTING OPERATIONS
IS 8448	1989		AUTOMATIC LINE VOLTAGE CORRECTOR (STABILISER)
IS 8519	1977		GUIDE FOR SELECTION OF INDUSTRIAL SAFETY EQUIPMENT FOR BODY PROTECTION
IS 8520	1977		GUIDE FOR SELECTION OF INDUSTRIAL SAFETY EQUIPMENT FOR EYE, FACE AND EAR PROTECTION
IS 875	1987		STRUCTURAL SAFETY OF BUILDING: LOADING STANDARD PART 1 TO 5
IS 8807	1978		GUIDE FOR SELECTION OF INDUSTRIAL SAFETY EQUIPMENT FOR PROTECTION OF ARMS AND HANDS
IS 8978	1985		INSTANTANEOUS WATER HEATERS
IS 8989	1978		SAFETY CODE FOR ERECTION OF CONCRETE FRAMED STRUCTURES
IS 940	1989		PORTABLE FIRE EXTINGUISHERS WATER TYPE (GAS CARTRIDGE)
IS 9457	1980		SAFETY COLOURS AND SIGNS
IS 9679	1980		CODE OF SAFETY FOR WORK ENVIRONMENTAL MONITORING
IS 9706	1997		CODE OF PRACTICE FOR THE CONSTRUCTION OF AERIAL RPEWAYS FOR THE TRANSPORTATION OF MATERIAL
IS 9759	1981		GUIDELINES FOR DEWATERING DURING CONSTRUCTION
IS 9815	1989		SERVO MOTOR OPERATED LINE VOLTAGE CORRECTOR (SERVO STABILISER)
IS 9944	1992		RECOMMENDATIONS ON SAFE WORKING LOAD FOR NATURAL AND MAN-MADE FIBRE ROPE SLINGS
IS 996	1979		SINGLE PHASE ELECTRIC MOTORS
ISO 3873	1977		SAFETY HELMET

SECTION-10
SPECIAL CONDITIONS OF CONTRACT

10.0 DRAWINGS AND DOCUMENTS

10.1
THE DETAILED DRAWINGS, SPECIFICATIONS AVAILABLE WITH BHEL ENGINEERS WILL ALSO FORM PART OF THIS TENDER SPECIFICATION. REVISION OF DRAWINGS/DOCUMENTS MAY TAKE PLACE DUE TO VARIOUS CONSIDERATIONS AS IS NORMAL IN SUCH LARGE PROJECT. WORK WILL HAVE TO BE CARRIED OUT AS PER REVISED DRAWINGS/ DOCUMENTS. THESE DOCUMENTS WILL BE MADE AVAILABLE TO THE CONTRACTOR DURING EXECUTION OF WORK AT SITE.

10.2
ONE SET OF NECESSARY DRAWINGS/DOCUMENTS TO CARRY OUT THE ERECTION WORK WILL BE FURNISHED TO THE CONTRACTOR BY BHEL ON LOAN THAT SHALL BE RETURNED TO BHEL AFTER COMPLETION OF THE WORK. CONTRACTOR'S PERSONNEL SHALL TAKE CARE OF THESE DOCUMENTS GIVEN TO THEM.

10.3
THE DATA FURNISHED IN VARIOUS SECTIONS AND APPENDICES AND THE DRAWINGS ENCLOSED WITH THIS TENDER SPECIFICATION DESCRIBE THE EQUIPMENT TO BE INSTALLED, TESTED AND COMMISSIONED UNDER THIS SPECIFICATION, BRIEFLY. HOWEVER, THE CHANGES IN THE DESIGN AND IN THE QUANTITY MAY BE EXPECTED TO OCCUR AS IS USUAL IN ANY SUCH LARGE SCALE OF WORKS.

10.4
IF ANY ERROR OR AMBIGUITY IS DISCOVERED IN THE SPECIFICATION/INFORMATION CONTAINED IN THE DOCUMENTS/DRAWINGS AND TENDER, THE CONTRACTOR SHALL FORTHWITH BRING THE SAME TO THE NOTICE OF BHEL BEFORE SUBMISSION OF OFFER.

10.5
IN CASE AN AMBIGUITY IS DETECTED AFTER AWARD OF WORK, THE SAME MUST BE BROUGHT TO THE NOTICE OF BHEL BEFORE COMMENCEMENT OF THE WORK/ACTIVITY. BHEL'S INTERPRETATION IN SUCH CASES WILL BE FINAL AND BINDING ON THE CONTRACTOR.

10.6
IN CASE OF ANY CONFLICT BETWEEN GENERAL INSTRUCTIONS TO TENDERNESS, GENERAL CONDITIONS OF CONTRACT CONTAINED IN SECTIONS 1 & 2 RESPECTIVELY AND SPECIAL CONDITIONS OF CONTRACT CONTAINED IN SECTIONS 4 TO 15 AND APPENDICES, PROVISIONS CONTAINED IN SPECIAL CONDITIONS OF CONTRACT IN SECTIONS 4 TO 15 AND APPENDICES SHALL PREVAIL.

10.7
IN CASE OF DISCREPANCY BETWEEN QUOTED ITEM RATE AND CORRESPONDING AMOUNT IN THE RATE SCHEDULE, THE **QUOTED ITEM RATES SHALL BE RECKONED AS CORRECT AND AMOUNT RECALCULATED**. QUOTED ITEM RATES SHALL ALSO PREVAIL FOR ARRIVING AT THE TOTAL PRICE QUOTED FOR OFFER EVALUATION.

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

11.0 TIME SCHEDULE, MOBILISATION, PROGRESS MONITORING, COMPLETION, OVERRUN, PRICE VARIATION ETC.

11.1 TIME SCHEDULE AND MOBILIZATION

11.1.1
THE CONTRACTOR SHALL MOBILIZE AT SITE TO START THE CONTRACTUAL WORK WITHIN **15 DAYS** FROM ISSUE OF FAX LETTER OF INTENT BY BHEL. CONTRACTOR SHALL AUGMENT HIS RESOURCES FURTHER IN SUCH A MANNER THAT THE ENTIRE WORK IS COMPLETED TO ACHIEVE THE FOLLOWING SCHEDULE:

SN	MILESTONE	COMPLETION SCHEDULE FROM START OF ERN.
01	HRSG DRUM LIFTING (HP+LP+IP)	8TH MONTH
02	HYDRAULIC TEST	9TH MONTHS
03	GAS IN	12TH MONTH
04	SAFETY VALVE FLOATING & STEAM BLOWING	13TH MONTH
05	COMBINED CYCLE TRIAL OPERATION	13 TH MONTH
06	RELIABILITY RUN COMPLETION	15TH MONTH
07	COMPLETION OF ALL FACILITIES	17TH MONTH

START OF CONTRACT PERIOD SHALL BE RECKONED FROM THE DATE OF ERECTION/PLACEMENT OF FIRST MAJOR EQUIPMENT / MAJOR ASSEMBLY / MAJOR SUB-ASSEMBLY ON ITS DESIGNATED FOUNDATION/LOCATION BY THE CONTRACTOR AND SO CERTIFIED BY BHEL ENGINEER. PLACEMENT OF PACKERS, INSERTS, FOUNDATION BOLTS AND SHIMS, OR CHIPPING OF FOUNDATIONS FOR PACKERS ETC. WILL NOT BE CONSIDERED FOR THIS PURPOSE.

11.1.2
IN ORDER TO MEET ABOVE SCHEDULE IN GENERAL, AND ANY OTHER INTERMEDIATE TARGETS SET, TO MEET CUSTOMER REQUIREMENTS, CONTRACTOR SHALL ARRANGE ALL NECESSARY RESOURCES IN CONSULTATION WITH BHEL.

11.1.3
CONTRACT PERIOD

THE TOTAL CONTRACT PERIOD SHALL BE **17 MONTHS** FROM THE START OF ERECTION WORK AS DEFINED IN CLAUSE 11.1.1 HEREIN EARLIER.

11.1.5
GRACE PERIOD

GRACE PERIOD OF **3 MONTHS** BEYOND CONTRACT PERIOD WILL BE APPLICABLE.

11.2
PROGRESS MONITORING, CONTRACT EXTENSION AND OVERRUN

11.2.1 PROGRESS MONITORING

11.2.1.1
PROGRESS WILL BE REVIEWED PERIODICALLY (DAILY / WEEKLY / MONTHLY) INCLUDING MONTH END REVIEW VIS-À-VIS THE PLANS DRAWN AS ABOVE. THE CONTRACTOR SHALL SUBMIT PERIODICAL PROGRESS REPORTS, AND OTHER

REPORTS / INFORMATION INCLUDING MANPOWER, CONSUMABLES ETC., AS DESIRED BY BHEL.

11.2.1.2
ASCERTAINING AND ESTABLISHING THE REASONS FOR SHORTFALL

THE ONUS-PROBANDI THAT THE CAUSES LEADING TO EXTENSION OF THE CONTRACT PERIOD IS NOT DUE TO ANY REASONS ATTRIBUTABLE TO THE CONTRACTOR IS ON HIM (THE CONTRACTOR). REVIEW OF THE PERFORMANCE AS STATED VIDE CL. 11.2.1 ABOVE WILL BE MADE CONSIDERING THE AVAILABILITY OF COMPONENTS TO BE ERECTED AND OTHER INPUTS / CONSTRAINTS OVER WHICH THE CONTRACTOR HAS NO CONTROL. THE PROGRAMME WILL BE REVIEWED AREA-WISE AND THE FOLLOWING FACTS WILL BE RECORDED IN CASE OF SHORTFALL AT THE END OF EVERY MONTH:

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

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

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

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

11.2.2 CONTRACT EXTENSION

12.2.2.1
IF THE COMPLETION OF WORK AS DETAILED IN THESE SPECIFICATIONS GETS DELAYED BEYOND THE END OF CONTRACT PERIOD AND GRACE PERIOD CONTRACTOR SHALL REQUEST FOR AN EXTENSION OF THE CONTRACT. DEPENDING ON THE BALANCE WORK LEFT OUT THEN, BHEL AT ITS DISCRETION MAY EXTEND THE CONTRACT.

11.2.2.2
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 NO.

11.2.1.2
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.

11.2.2.3
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.

11.2.3 OVERRUN COMPENSATION

IF THE CONTRACT IS EXTENDED BEYOND THE CONTRACT AND GRACE PERIOD FOR ANY REASONS OTHER THAN THOSE ATTRIBUTABLE TO THE CONTRACTOR OR FORCE MAJEURE CONDITIONS, THE CONTRACTOR WILL BE COMPENSATED BY PAYMENT OF OVER RUN CHARGES AT THE RATE OF **RS. 1,00,000/-** PER MONTH (RUPEES ONE LAKH ONLY). OVER RUN COMPENSATION WILL BE PAID FOR THE EXTENSION ATTRIBUTABLE TO BHEL ONLY. NO OVER RUN COMPENSATION WILL BE PAYABLE FOR THE EXTENSION ON ACCOUNT OF REASONS ATTRIBUTABLE TO CONTRACTOR AND / OR FORCE MAJEURE CONDITIONS.

11.3 PRICE VARIATION

In order to take care of variation in cost of execution of work on either side, due to variation in the index of LABOUR, DIESEL and ELECTRODE, Price Variation Formula as described herein shall be applicable

11.3.1

85% component of Contract Value shall be permitted to be adjusted for variation in various relevant indices during execution of work. The remaining 15% shall be treated as fixed component.

11.3.2

The basis for calculation of price variation in each category, their component, Base Index, Base Date of accounting shall be as under:

.SL NO.	CATEGORY	COMPONENT ('K')	BASE INDEX	BASE DATE
A)	LABOUR (ALL CATEGORIES)	40%	CONSUMER PRICE INDEX FOR INDUSTRIAL WORKERS (GENERAL), APPLICABLE TO 'ALL INDIA' AS PUBLISHED BY LABOUR BUREAU, SHIMLA	Base date shall be calendar month of last date of submission of Tender (including extended date of submission if any)
B)	H.S. DIESEL OIL	5%	WHOLE SALE PRICE INDEX (FOR COMMODITY :HIGH SPEED DIESEL) PUBLISHED BY MINISTRY OF COMMERCE AND INDUSTRY (www.eaindustry.nic.in)	...DO...
C)	WELDING ELECTRODE	40%	WHOLE SALE PRICE INDEX (FOR COMMODITY:ELECTRODES) PUBLISHED BY MINISTRY OF COMMERCE AND INDUSTRY (www.eaindustry.nic.in)	...DO...

11.3.3

Payment/recovery due to variation in index shall be determined on the basis of the following notional formula without any initial absorption, in respect of the identified components viz LABOUR, HS DIESEL and ELECTRODE

$$A = K \times R \times \frac{(X_N - X_o)}{X_o}$$

Where

A = Amount to be paid/recovered due to variation in the Index for Labour, Electrode and HS Diesel

K = Percentage component applicable for Labour, Electrode and HS Diesel

R = Value of work done for the billing month

XN = Revised Index No for Labour, Electrode and HS Diesel for the billing month under consideration

Xo = Index no for Labour, Electrode and HS Diesel as on the Base date. Base date for each of the category is defined in the table above

11.3.4

The above Price Variation formula is applicable for the entire Contract period, Grace period, and the extended contract period if any. However for the period extended on account of reasons attributable to the contractor and/or Force Majeure conditions, the price variation will be applied based on the respective indices/prices frozen at the calendar month preceeding the start of such extended period.

11.3.5

The price Variation is not applicable to Over Run Charges, Manday rates for extra works etc.

Similarly Price Variation shall not be applicable for the respective % assigned to milestone activities viz Oil Flushing, Barring Gear, Commissioning of Condensate System, Commissioning of Feed Water System and Synchronisation

11.3.6

The contractor shall furnish necessary monthly bulletins for WHOLE SALE PRICE INDEX (for Commodity :ELECTRODES and HS DIESEL) Published by Ministry of Commerce and Industry (www.eaindustry.nic.in) and CONSUMER PRICE INDEX for INDUSTRIAL WORKERS (GENERAL), applicable to 'All India' as published by Labour Bureau, Shimla.

11.3.7

The contractor will be required to raise the bills for price variation payments on a monthly basis along with the running bills irrespective of the fact whether any increase/decrease in the consumer price index for Labour, HS Diesel and Electrode has taken place or not. In case there is delay in publication of bulletins (final figure), the provisional values as published can be considered for payments and arrears shall be paid/recovered on getting the final values.

11.3.8

The Total Quantum of Price Variation shall not exceed fifteen percentage (15%) of executed Contract Value. Executed Contract value for this 15% cap shall not include Overrun charges, Extra works.

11.3.9

With the above provision, the clause no. 2.15 of General Conditions of Contract section-2 is not applicable.

11.4 CONTRACT VARIATIONS

11.4.1 VARIATION IN QUANTITIES

WEIGHT OF VARIOUS EQUIPMENTS, QUANTITIES OF VARIOUS ITEMS OF WORK, ETC. COVERED UNDER THESE SPECIFICATIONS, & INDICATED IN RELEVANT APPENDICES ARE LIKELY TO VARY. FOR ANY UPWARD OR DOWNWARD VARIATION IN THE QUANTITIES THE RATES ACCEPTED SHALL BE APPLICABLE WITHOUT ANY VARIATION, WHEREVER UNIT RATE IS APPLICABLE. PAYMENT WILL BE MADE BY BHEL FOR THE ACTUAL EXECUTED QUANTITIES IN SUCH CASES.

11.5 INTEREST BEARING RECOVERABLE ADVANCE

Interest bearing (rate of interest shall be prime leading rate of SBI plus 2% per annum, 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 by the time contractor reaches 90% billing of total value of work executed & within the contract period (including extensions granted or foreclosure if any).

11.6 DEFINITION OF WORK COMPLETION

THE CONTRACTOR'S SCOPE OF WORK UNDER THESE SPECIFICATIONS WILL DEEM TO HAVE BEEN COMPLETED IN ALL RESPECT, ONLY WHEN ALL THE ACTIVITIES ARE COMPLETED SATISFACTORILY AND SO CERTIFIED BY BHEL SITE IN CHARGE. THE DECISION OF BHEL IN THIS REGARD SHALL BE FINAL AND BINDING ON THE CONTRACTOR.

SECTION-12

SPECIAL CONDITIONS OF CONTRACT

12.0 TERMS OF PAYMENT

12.0.1
The contractor shall submit his monthly RA account bills with all the details required by BHEL on specified date every month covering progress of work in all respects and areas for the previous calendar 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:

9. Name of the Company
10. Name of Bank
11. Name of Bank Branch
12. City/Place
13. Account Number
14. Account type
15. IFSC code of the Bank Branch
16. 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 FOR 100% PHYSICAL PROGRESS

12.1.1 FOR HRSG DRUMS LIFTING AND PLACMENT IN POSITION:

5% OF AWARDED VALUE OF CONTRACT SHALL BE RELEASED ON FOLLOWING ACTIVITIES:

(i) ON LIFTING AND PLACEMENT OF HP DRUM ON ITS REQUIRED POSITION AND ELEVATION:3.00%

(ii) ON LIFTING AND PLACEMENT OF IP DRUM ON ITS REQUIRED POSITION AND ELEVATION:1.50%

(iii) ON LIFTING AND PLACEMENT OF LP DRUM ON ITS REQUIRED POSITION AND ELEVATION:0.50%

12.1.2

95% OF AWARDED VALUE OF CONTRACT FOR PIPING, HRSG & ITS AUXILIARIES INCLUDING CHIMNEY, INSULATION, STRUCTURES, PRESSURE PARTS, NON-PRESSURE PARTS ETC.WORKS SHALL BE RELEASED AS PER FOLLOWING STAGE PROGRESS PAYMENTS:

12.1.2.1 FOR PIPES, VALVES, & HANGERS & SUPPORTS

1. 30% OF CONTRACT RATE ON PRO RATA BASIS AFTER ERECTION.

2. 40% OF CONTRACT RATE ON PRO RATA BASIS ON COMPLETION OF ALIGNMENT AND WELDING/ BOLTING ETC.

3. 15% OF CONTRACT RATE ON PRO RATA BASIS ON COMPLETION OF RADIOGRAPHY AND HEAT TREATMENT.

4. 5% OF CONTRACT RATE ON PRO RATA BASIS ON COMPLETION OF HYDRAULIC TEST/ PRESSURE DECAY TEST OR ANY OTHER TEST AS APPLICABLE OF CONCERNED LINE.

5. 2% OF CONTRACT RATE ON PRO RATA BASIS ON COMPLETION OF PERMANENT SUPPORTS, COLD-SETTING OF HANGERS.

6. 4% OF CONTRACT RATE ON PRO RATA BASIS ON COMPLETION STEAM BLOWING.

7. 2% OF CONTRACT RATE ON PRO RATA BASIS ON SYNCHRONIZATION OF STG UNIT.

8. 1% OF CONTRACT RATE ON PRO RATA BASIS AFTER HOT CORRECTION OF HANGERS AND ACCEPTANCE ON A JOINT PROTOCOL BY BHEL AND CUSTOMER.

9. 1% OF THE CONTRACT RATE ON PRORATA BASIS AFTER SATISFACTORY COMPLETION OF FINAL PAINTING.

12.1.2.2 HRSG AND IT'S AUXILIARIES

PROGRESSIVE PAYMENT FOR VARIOUS ITEMS OF HRSG AND ITS AUXILIARIES SHALL BE RELEASED ON PRO-RATA BASIS AS PER THE STAGE BREAK UP GIVEN HEREUNDER:

SL. NO.	PART OF THE ACTIVITY COMPLETED	PERCENTAGE OF ACCEPTED ITEM RATES (REF RESPECTIVE S.NO. RATE SCHEDULE)			
		NON-PRESSURE PARTS, STACK	STRUCTURES	PRESSURE PARTS, HEAT TRAN. MOD	INSULATION
A	ERECTION / PLACEMENT	45%	45%	40%	---
B	ALIGNMENT / WELDING / BOLTING WITH PERMANENT SUPPORTS	40%	50%	40%	---
C	GAS TIGHTNESS TEST / KEROSENE LEAK TEST / LPI TEST AS APPLICABLE	10%	---	---	---
D	RADIOGRAPHY, HEAT TREATMENT AND OTHER NDE TEST COMPLETION	---	---	10%	---
E	APPLICATION OF THERMAL INSULATION	---	---	---	95%
F	ON COMPLETION OF HYDRAULIC TEST OF HRSG	-	-	5%	0
G	ON COMPLETION OF SAFETY VALVE FLOATING	2%	2%	2%	2%
H	ON COMPLETION OF TRIAL OPERATION	1%	1%	1%	1%
I	ON COMPLETION OF FINAL PAINTING	1%	1%	1%	1%
J	ON COMPLETION OF ALL FACILITIES OF HRSG	1%	1%	1%	1%
	TOTAL	100%	100%	100%	100%

NOTE: PAYMENTS FOR DRUMS (HP, IP & LP) LIFTING SHALL BE ON ACTUAL VALUE OF CONTRACT EXECUTED. HOWEVER FOR THE PURPOSE OF INITIAL PAYMENT, THE PAYMENT WILL BE MADE ON AWARDED CONTRACT VALUE AND THESE VALUES SHALL BE EFFECTED (I.E. SHALL BE RECOVERED /

LEFT OVER PAYMENT WILL BE MADE) GRADUALLY BASED ON ACTUAL CONTRACT VALUE EXECUTED. THE EXTRA WORK, ORC PAYMENT (IF ANY) AND PVC PAYMENT SHALL NOT BE CONSIDERED FOR THE PURPOSE OF ABOVE ACTUAL CONTRACT VALUE FOR DRUMS LIFTING & PLACEMENT

12.1.3
FOR PAYMENT OF TEMPORARY SYSTEM FOR CHEMICAL CLEANING AND STEAM BLOWING OF HRSG AND PIPING THE MEASUREMENT FOR THE PIPING, FITTING, VALVES ETC AND EQUIPMENTS LIKE CHEMICAL CIRCULATION PUMPS, TANKS, STRUCTURES PROVIDED BY BHEL & NOT FIGURING IN SHIPPING LIST WILL BE BASED ON JOINTLY MEASURED QUANTITY AND CORRESPONDING STANDARD WEIGHTS. PAYMENT WILL BE MADE AT THE RATE APPLICABLE FOR **NON-PRESSURE PARTS** FOR ITEMS. NO PAYMENT WILL BE MADE FOR FOUNDATIONS MADE BY THE CONTRACTOR FOR TEMPORARY SYSTEMS. SIMILARLY, NO PAYMENT WILL BE MADE FOR TEMPORARY SYSTEM INSTALLED FOR CONDUCTING HYDRAULIC TEST OF VARIOUS PIPING SYSTEMS AND HRSG.

12.2 GENERAL

12.2.1
WEIGHT OF PACKERS AND SHIMS WHICH BECOME PERMANENT PART OF EQUIPMENT, BOTH FIGURING IN SHIPPING LIST AND THOSE FABRICATED AT SITE WILL BE PAID FOR ON SHIPPING LIST BASED ACTUAL WEIGHT.

12.2.2
CERTAIN OPTIMIZED ASSEMBLIES / OR MODULES MAY BE MADE, ASSEMBLING PRODUCTS FROM TWO OR MORE DIFFERENT PRODUCT GROUP MAIN ASSEMBLY AND DISPATCHED. PAYMENT FOR ERECTION OF THESE OPTIMIZED ASSEMBLIES / OR MODULES WILL BE REGULATED AS PER THE WEIGHT OF INDIVIDUAL PRODUCT GROUP MAIN ASSEMBLIES CONTRIBUTING TO THE TOTAL WEIGHT OF THE MODULE OR OPTIMIZED ASSEMBLY AT THE QUOTED RATE FOR THE RESPECTIVE PRODUCT GROUP MAIN ASSEMBLIES, IN THE RATE SCHEDULE.

12.3 MEASUREMENT OF THE WORK COMPLETED

A) WHERE PAYMENT IS TO BE MADE ON THE BASIS OF WEIGHT, THE WEIGHT PER UNIT GIVEN IN THE BHEL DOCUMENT ONLY SHALL BE TAKEN IN TO CONSIDERATION. IN CASE SUCH AN INFORMATION IS NOT AVAILABLE IN BHEL DOCUMENTS, THEN THE LATEST RELEVANT INDIAN STANDARDS IN THIS REGARD MAY BE APPLIED.

B) SPARES, SURPLUS QUANTITY, ERECTION CONTINGENCY MATERIALS WILL NOT BE PAID FOR UNLESS THE SAME HAS BEEN CONSUMED IN PLACE OF REGULAR ITEM OF MEASURABLE WORK AS PER THE RATE SCHEDULE.

C) WHERE THE PAYMENT IS MADE ON THE BASIS OF ITEM RATE, ACTUAL EXECUTED QUANTITY MEASURED JOINTLY SHALL ONLY BE PAID FOR.

D) IT IS CLARIFIED THAT AS FAR AS WEIGHT CONSTITUTED BY WELDING CONSUMABLES AND OTHER CONSUMABLES SUPPLIED BY BHEL AS WELL AS BY THE CONTRACTOR, SHALL BE IGNORED FOR THE PURPOSE PAYMENT.

E) 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.

F) WASTAGE ALLOWANCE PROVIDED ELSEWHERE ON APPLICATION OF REFRACTORY & INSULATION WILL BE APPLIED ON THE NET ISSUED QUANTITY. THE NET ISSUED QUANTITY IS GROSS ISSUE LESS THE QUANTITY RETURNED. THE WASTAGE ALLOWANCE WILL BE APPLIED AT THE FINAL RECONCILIATION STAGE. THE PAYABLE AMOUNT WILL THEN BE RESTRICTED TO THE NET QUANTITY AFTER WASTAGE ALLOWANCE.

NO SEPARATE PAYMENT SHALL BE MADE FOR GROUTING OF EQUIPMENTS, STRUCTURES ETC SPECIFIED ELSEWHERE IN THESE SPECIFICATIONS.

SECTION-13

SPECIAL CONDITIONS OF CONTRACT

13.0 EXTRA CHARGES FOR RECTIFICATION AND MODIFICATION

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

13.2
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 ON MANDAY BASIS, FOR SUCH OF THOSE ACTIVITIES DETAILED IN CLAUSE 13.1 WHICH REQUIRE MORE THAN **100 MAN-HOURS** AND SUCH PAYMENT WILL BE REGULATED BY THE TERMS, CONDITIONS AND STIPULATIONS CONTAINED IN THE CLAUSES CONTAINED HEREINAFTER. IT MAY BE SPECIFICALLY NOTED THAT THE DECISION OF BHEL AS TO WHETHER SUCH PAYMENT IS DUE SHALL BE FINAL AND BINDING ON THE CONTRACTOR. 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
EXTRA WORKS SHOULD BE DONE BY A SEPARATELY IDENTIFIABLE GANG, WITHOUT AFFECTING ROUTINE ACTIVITIES. DAILY LOG SHEETS IN THE PROFORMA PRESCRIBED BY BHEL SHOULD BE MAINTAINED AND SHALL BE SIGNED BY THE CONTRACTOR'S REPRESENTATIVE AND BHEL ENGINEER. NO CLAIM FOR EXTRA WORK WILL BE CONSIDERED / ENTERTAINED IN THE ABSENCE OF THE SAID SUPPORTING DOCUMENTS I.E. DAILY MAN-HOUR LOG SHEETS. IT MAY, HOWEVER, BE NOTED THAT SIGNING OF LOG SHEETS BY BHEL ENGINEER DOES NOT MEAN THE ACCEPTANCE OF SUCH WORKS AS PAYABLE EXTRA WORKS.

13.5
SUCH EXTRA WORKS ARISING OUT OF TRANSIT, STORAGE AND ERECTION DAMAGES, PAYMENT, IF FOUND DUE, WILL BE REGULATED AS PER SECTION-14.

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

13.7
IT SHALL BE NOTED THAT ALL EXTRA WORKS THAT ARISE ON ACCOUNT OF THE CONTRACTOR'S FAULT, WILL HAVE TO BE CARRIED OUT BY THE CONTRACTOR FREE OF COST. UNDER SUCH CIRCUMSTANCES, ANY MATERIAL AND CONSUMABLE REQUIRED FOR THIS PURPOSE WILL ALSO HAVE TO BE ARRANGED BY THE CONTRACTOR AT HIS COST.
13.7
AFTER ELIGIBILITY OF EXTRA WORKS IS ESTABLISHED AND FINALLY ACCEPTED BY BHEL ENGINEER / DESIGNER, PAYMENT WILL BE RELEASED ON COMPETENT AUTHORITY'S APPROVAL AT THE FOLLOWING RATE.

MAN-DAY RATE FOR ELIGIBLE EXTRA WORKS

SINGLE AVERAGE MAN-DAY RATE FOR 8 WORKING HOURS, INCLUDING OVERTIME IF ANY, AND OTHER SITE EXPENSES AND INCIDENTALS, INCLUDING SUPREVISION, CONSUMABLES, TOOLS AND TACKLES, WILL BE **RS. 320/- (RUPEES THREE HUNDRED TWENTY ONLY).**

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

SECTION-14

SPECIAL CONDITIONS OF CONTRACT

14.0 Insurance

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

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

14.2 Reporting Damages and Carrying out Repairs

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

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

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

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

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

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

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

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

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

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

14.2.11
In case of theft / damage / loss of materials due to **repeated/continued instances of negligence/failure** attributable to the contractor, the expenses incurred on account of repair/ replacement of such components including BHEL's overhead expenses as applicable (presently @ 30%) in excess of the amount realized from the underwriters, if any, shall be recovered from the contractor. Recovery will be limited to Normal Deductible Franchise (DF)/Excess as per applicable Insurance (TAC) tariff guidelines for every incidence of loss/damage.

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

14.3 Insurance by the Contractor and Indemnification of BHEL

14.3.1

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

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

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

SECTION-15

SPECIAL CONDITION OF CONTRACT

15.0 EARNEST MONEY DEPOSIT , SECURITY DEPOSIT & BANK GUARANTEE

15.1 Earnest Money Deposit:

i) EMD for this tender is Rs. 2,00,000/- (Rupes Two lakhs only).
ii) Bidders who have already deposited One Time EMD of Rs. 2.00 lakh are exempted from submission of EMD for this tender. However a copy of 'One Time EMD' certificate issued by BHEL/PSWR, Nagpur shall be enclosed along with the Offer.
iii) EMD is to be paid in cash (as permissible under Income Tax Act), Pay order or Demand Draft in favour of Bharat Heavy Electricals Limited and payable at Nagpur.
iv) No other form of EMD remittance shall be acceptable to BHEL.

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

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

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

15.1.2 EMD shall not carry any interest.

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

15.2 Security Deposit

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

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

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

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. The Bank Guarantee format should have the approval of BHEL.

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

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

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

ix. The Security Deposit shall not carry any interest.

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

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

15.3 BANK GUARANTEE

i. It is the responsibility of the bidder to get the Bank Guarantees revalidated/extended for the required period as per the advice of BHEL Site Engineer / Construction Manager. BHEL shall not be held liable for issue of any reminders regarding expiry of the Bank Guarantees.

ii. In case extension/further extensions of any Bank Guarantees are not required, the bidders shall ensure that the same is explicitly conveyed through the Construction Manager to BHEL PSWR/HQ, Nagpur

iii. In case the Bank Guarantees are not extended before the expiry date, BHEL reserves the right to invoke the same by informing the concerned Bank in writing, without any advance notice/communication to the concerned bidder.

iv. **Bidders to note that any corrections to Bank Guarantees shall be done by the issuing Bank, only through an amendment in an appropriate non judicial stamp paper.**

v. Bidders to ensure that the Bank Guarantees submitted are exactly as per format given in the Tender documents.

vi. The Original Bank Guarantee shall be sent directly by the Bank to BHEL under Registered Post (Acknowledgement Due). However, in exceptional cases, where guarantee is directly received by Vendor, the Vendor shall instruct the Bank to send an unstamped duplicate copy of the guarantee directly to BHEL under Registered Post (Acknowledgement Due).

APPENDIX-I
DETAILS OF QUANTITIES

(A) ESTIMATED WEIGHT OF VARIOUS PRODUCT GROUPS OF HEAT RECOVERY STEAM GENERATOR, CHIMNEY, POWER CYCLE & RE-GENERATIVE PIPING AND INSULATION WITH CLADDING MATERIALS FOR HAZIRA CCPP.

PGMA	DESCRIPTION	Est. Wt in Kg.
1) STRUCTURES		
35-010	BLR FOUNDATION MATL.	1295
35-011	SHIM PLATES	15229
35-110	MAIN COLUMN LEFT	165671
35-120	MAIN COLUMN RIGHT	157521
35-130	INLET DUCT COLUMNS	29738
35-140	AUX COLUMNS	5790
35-220	PR.PARTS SUPPORT ON ROOF	70000
35-390	MODULE UPRIGHTING FRAME	9207
35-391	MODULE TRANSPORTING FRAME	172748
35-392	SINGLE MODULE HANDLING FRAME	4271
35-520	COLUMN SIDE BRACING	3578
35-591	BOTTOM BRACING BEAM	45371
35-592	TOP BRACING BEAM	84581
35-593	CROSS BEAMS	27195
35-594	STIFFENER BEAMS	62502
35-595	STACKING BEAM ARRGT	24717
35-596	PACKING BEAM ARRGT	116795
35-597	PR.PART SUPPORT	43946
35-610	BOILER ROOF STRUCTURE	66640
35-611	BOILER ROOF SHEETING (PRECOATED)	12500
36-210	MAIN FLOOR I LEVEL	7474
36-220	MAIN FLOOR II LEVEL	3703
36-230	MAIN FLOOR III LEVEL	3408
36-240	MAIN FLOOR IV LEVEL	43690
36-250	MAIN FLOOR V LEVEL	2840
36-390	MISC.PLATFORMS	5000
36-810	FLOORGRILLS&GUARD PLATE	60000
36-820	STAIRS AND LADDERS (G.I)	12914
36-850	PLATFORMS AND LADDERS (G.I)	18672
	SUB TOTAL (1)	**1276996**
2) PRESSURE PARTS INCLUDING HEAT TRANSFER MODULES		
04-116	BOILER DRUM WITH INTERNALS - IP	38036
04-118	BOILER DRUM WITH INTERNALS - HP	156493
04-144	DRUM SLIDE BEARING PLATES - HP	130

PGMA	DESCRIPTION	Est. Wt in Kg.
04-146	DRUM SLIDE BEARING PLATES - IP	130
04-148	DRUM SLIDE BEARING PLATES - LP	130
04-149	FASTENERS FOR DRUM SADDLE - HP	23
04-156	FASTENERS FOR DRUM SADDLE - IP	18
04-158	FASTENERS FOR DRUM SADDLE - LP	18
04-176	BOILER DRUM WITH INTERNALS - LP	21021
07-206	RISER PIPES - HP	9375
07-207	RISER PIPES - IP	1866
07-208	RISER PIPES - LP	3573
07-210	RISER HEADERS & LINKS - HP	15255
07-211	RISER HEADERS & LINKS - IP	1798
07-212	RISER HEADERS & LINKS - LP	2715
07-411	DOWNCOMER SUSPENSIONS-HP	7000
07-412	DOWNCOMER SUSPENSIONS-IP	936
07-413	DOWNCOMER SUSPENSIONS-LP	521
07-504	EVAP. MODULE SUPPORTS-HP FRONT	3239
07-505	EVAP. MODULE SUPPORTS-HP REAR	7640
07-506	EVAP. MODULE SUPPORTS-IP FRONT	1519
07-507	EVAP. MODULE SUPPORTS-IP REAR	1823
07-508	EVAP. MODULE SUPPORTS-LP FRONT	3690
07-510	EVAP. MODULE SUPPORTS-LP REAR	964
07-992	IMPORTED ELECTRODES	61
07-993	ERECTION MATERIALS	477
08-910	EXPN MOVEMENT MEASURING COMPONENT	1933
10-121	HPSH-II- INLET HEADER	5500
10-135	HPSH-1A INLET HEADER	2500
10-221	HPSH-II- OUTLET HEADER	8000
10-235	HPSH-1A OUTLET HEADER	10500
10-236	HPSH-1B OUTLET HEADER	5500
12-850	HP SAT. STEAM CONNECTING PIPES	5700
12-852	HP SH DE SUPERHEATER LINKS	13600
12-853	LP SAT. STEAM CONNECTING PIPES	2400
12-855	IP SAT. STEAM CONNECTING PIPES	1700
12-900	HP SH DE SUPERHEATER	876
12-901	HP SH. LINK SUPPORTS	2250
12-902	IP SH. LINK SUPPORTS	1250
12-904	LP SH. LINK SUPPORTS	1500
12-911	LP SH MODULE SUPPORTS	1000
12-912	IP SH MODULE SUPPORTS	3000
12-913	HP SH MODULE SUPPORTS	2500
12-992	IMPORTED ELECTRODES	25
12-993	ERECTION MATERIALS	700
15-138	REHEATER-II- INLET HEADER	8000
15-174	REHEATER-I- INLET HEADER	6000
15-238	REHEATER-II- OUTLET HEADER	7000
15-274	REHEATER-I- OUTLET HEADER	8000

17-852	REHEATER DESH-LINKS	22600
17-900	REHEATER DESH	1400
17-901	RH LINK SUPPORTS	500
17-904	RH MODULE SUPPORTS	2788
17-905	HRH & CRH LINK SUPPORTS	3000
17-992	IMPORTED ELECTRODES	25
17-993	ERECTION MATERIALS	700
19-101	CPH INLET LINE	2900
19-102	CPH OUTLET LINE	2112
19-850	HP ECONOMISER FEED PIPE	2200
19-851	HP ECONOMISER LINK TO DRUM	2400
19-852	HP ECO. I & II MODULE CONNECTING LINKS	1600
19-853	LP ECONOMISER FEED PIPE	400
19-854	IP ECONOMISER FEED PIPE	200
19-855	IP ECO LINK TO DRUM	1200
19-856	HP ECO-II & III CONNECTING LINKS	1400
19-857	HP ECO-III (FRONT & REAR) MODULE CONN. LINKS	1900
19-901	HP ECONOMISER LINK SUPPORTS	4500
19-904	LP ECONOMISER LINK SUPPORTS	400
19-905	IP ECONOMISER LINK SUPPORTS	500
19-908	SUPPORTS FOR CPH LINKS	1388
19-911	CPH MODULE SUPPORTS	4498
19-912	HP ECO-III MODULE SUPPORTS (FRONT)	5145
19-913	HP ECO-III MODULE SUPPORTS (REAR)	2031
19-914	HP ECO-II MODULE SUPPORTS	3099
19-915	HP ECO-I MODULE SUPPORTS	242
19-916	IP ECO MODULE SUPPORTS	652
19-992	IMPORTED ELECTRODES	20
19-993	ERECTION MATERIALS	400
24-200	DRAINS,VENTS & FITTINGS FOR LP CIRCUIT	5000
24-201	BOILER TRIM PIPING SUPPORTS FOR LP CIRCIT	1500
24-260	BHEL VALVES FOR LP CIRCUIT	5000
24-273	LP DRAUM WATER LEVEL GUAGE	265
24-275	LP DRAIN HEADER	400
24-280	LP SAFETY VALVES	500
24-300	DRAINS,VENTS & FITTINGS FOR IP CIRCUIT	6000
24-301	BOILER TRIM PIPING SUPPORTS FOR IP CIRCUIT	1500
24-360	BHEL VALVES FOR IP CIRCUIT	5000
24-373	IP DRUM WATER LEVEL GUAGE	265
24-375	IP DRAIN HEADERS	500
24-380	IP SAFETY VALVES	500
24-400	HP DRAINS,VENTS&FITTING	18000
24-401	BLR TRIM PIPING SUPPORTS FOR HP CIRCUIT	3000
24-420	HP SAFETY VALVE ESCAPE	5000
24-425	HP SAFETY VALVE ESCAPE PIPING SUPPORTS	3500
24-460	BHEL VALVES FOR HP CIRCUIT	10000
24-465	BELOOWS& VALVES(SUB-DELIVERY)	8000
24-473	HP DRUM LEVEL GUAGE	265

24-475	HP DRAIN HEADERS	600
24-480	HP SAFETY VALVES&ERV	1200
24-955	LAPPING TOOLS FOR SAFETY VALVES	200
24-960	LAPPING TOOLS FOR CONVENTIONAL VALVES	300
24-992	IMPORTED ELECTRODES	45
24-993	ERECTION MATERIALS	2000
24-994	NAME PLATES	205
97-402	EWLI	500
HL-101	EVAPORATOR MODULE ASSY.- HP FRONT LEFT	90598
HL-102	EVAPORATOR MODULE ASSY.- HP FRONT MIDDLE	90598
HL-103	EVAPORATOR MODULE ASSY.- HP FRONT RIGHT	90598
HL-104	EVAPORATOR MODULE ASSY.- HP REAR LEFT	52779
HL-105	EVAPORATOR MODULE ASSY.- HP REAR MIDDLE	52779
HL-106	EVAPORATOR MODULE ASSY.- HP REAR RIGHT	52779
HL-111	EVAPORATOR MODULE ASSY.- IP FRONT LEFT	35057
HL-112	EVAPORATOR MODULE ASSY.- IP FRONT MIDDLE	35057
HL-113	EVAPORATOR MODULE ASSY.- IP FRONT RIGHT	35057
HL-114	EVAPORATOR MODULE ASSY.- IP REAR LEFT	42062
HL-115	EVAPORATOR MODULE ASSY.- IP REAR MIDDLE	42062
HL-116	EVAPORATOR MODULE ASSY.- IP REAR RIGHT	42062
HL-121	EVAPORATOR MODULE ASSY.- LP FRONT LEFT	84146
HL-122	EVAPORATOR MODULE ASSY.- LP FRONT MIDDLE	84146
HL-123	EVAPORATOR MODULE ASSY.- LP FRONT RIGHT	84146
HL-124	EVAPORATOR MODULE ASSY.- LP REAR LEFT	21033
HL-125	EVAPORATOR MODULE ASSY.- LP REAR MIDDLE	21033
HL-126	EVAPORATOR MODULE ASSY.- LP REAR RIGHT	21033
HL-131	HP SH-II MODULE ASSY	16278
HL-132	HP SH-II MODULE ASSY	16278
HL-133	HP SH-II MODULE ASSY	16278
HL-134	HP SH-I MODULE ASSY	24546
HL-135	HP SH-I MODULE ASSY	24546
HL-136	HP SH-I MODULE ASSY	24546
HL-141	LP SH MODULE ASSY	5579
HL-142	LP SH MODULE ASSY	5579
HL-143	LP SH MODULE ASSY	5579
HL-147	IP SH MODULE ASSY	5327
HL-148	IP SH MODULE ASSY	5527
HL-149	IP SH MODULE ASSY	5527
HL-151	HP ECO-III MODULE ASSY (FRONT)	112203
HL-152	HP ECO-III MODULE ASSY (FRONT)	112203
HL-153	HP ECO-III MODULE ASSY (FRONT)	112203
HL-154	HP ECO-III MODULE ASSY (REAR)	44882
HL-155	HP ECO-III MODULE ASSY (REAR)	44882
HL-156	HP ECO-III MODULE ASSY (REAR)	44882
HL-157	HP ECO-II MODULE ASSY	89736
HL-158	HP ECO-II MODULE ASSY	89736
HL-159	HP ECO-II MODULE ASSY	89736
HL-161	HP ECO-I MODULE ASSY	7480

HL-162	HP ECO-I MODULE ASSY	7480
HL-163	HP ECO-I MODULE ASSY	7480
HL-164	IP ECO. MODULE ASSY	12361
HL-165	IP ECO. MODULE ASSY	12361
HL-166	IP ECO. MODULE ASSY	12361
HL-171	CPH MODULE ASSY.	98369
HL-172	CPH MODULE ASSY.	98369
HL-173	CPH MODULE ASSY.	98369
HL-181	RH-II MODULE ASSY	20678
HL-182	RH-II MODULE ASSY	20678
HL-183	RH-II MODULE ASSY	20678
HL-184	RH-I MODULE ASSY	17052
HL-185	RH-I MODULE ASSY	17052
HL-186	RH-I MODULE ASSY	17052
HL-201	LINKS FOR EVAP. MODULES- HP FRONT LEFT	3973
HL-202	LINKS FOR EVAP. MODULES- HP FRONT MIDDLE	3973
HL-203	LINKS FOR EVAP. MODULES- HP FRONT RIGHT	3973
HL-204	LINKS FOR EVAP. MODULES- HP REAR LEFT	15231
HL-205	LINKS FOR EVAP. MODULES- HP REAR MIDDLE	3590
HL-206	LINKS FOR EVAP. MODULES- HP REAR RIGHT	15231
HL-211	LINKS FOR EVAP. MODULES- IP FRONT LEFT	286
HL-212	LINKS FOR EVAP. MODULES- IP FRONT MIDDLE	286
HL-213	LINKS FOR EVAP. MODULES- IP FRONT RIGHT	286
HL-214	LINKS FOR EVAP. MODULES- IP REAR LEFT	3966
HL-215	LINKS FOR EVAP. MODULES- IP REAR MIDDLE	1011
HL-216	LINKS FOR EVAP. MODULES- IP REAR RIGHT	3965
HL-221	LINKS FOR EVAP. MODULES- LP FRONT LEFT	292
HL-222	LINKS FOR EVAP. MODULES- LP FRONT MIDDLE	292
HL-223	LINKS FOR EVAP. MODULES- LP FRONT RIGHT	292
HL-224	LINKS FOR EVAP. MODULES- LP REAR LEFT	2103
HL-225	LINKS FOR EVAP. MODULES- LP REAR MIDDLE	670
HL-226	LINKS FOR EVAP. MODULES- LP REAR RIGHT	2102
HL-231	HP SH-II CROSSOVER ASSY	2530
HL-232	HP SH-II CROSSOVER ASSY	2530
HL-233	HP SH-II CROSSOVER ASSY	2530
HL-234	HP SH-I CROSSOVER ASSY	5280
HL-235	HP SH-I CROSSOVER ASSY	5280
HL-236	HP SH-I CROSSOVER ASSY	6200
HL-251	HP ECO-III CROSSOVER ASSY (FRONT)	1028
HL-252	HP ECO-III CROSSOVER ASSY (FRONT)	1028
HL-253	HP ECO-III CROSSOVER ASSY (FRONT)	1028
HL-254	HP ECO-III CROSSOVER ASSY (REAR)	313
HL-255	HP ECO-III CROSSOVER ASSY (REAR)	313
HL-256	HP ECO-III CROSSOVER ASSY (REAR)	313
HL-257	HP ECO-II CROSSOVER ASSY	600
HL-258	HP ECO-II CROSSOVER ASSY	600
HL-259	HP ECO-II CROSSOVER ASSY	600
HL-264	IP ECO. CROSS OVER ASSY	221

HL-265	IP ECO. CROSS OVER ASSY	221
HL-266	IP ECO. CROSS OVER ASSY	221
HL-271	LINKS FOR CPH MODULES- HP FRONT LEFT	1546
HL-272	LINKS FOR CPH MODULES- HP FRONT MIDDLE	1546
HL-273	LINKS FOR CPH MODULES- HP FRONT RIGHT	1546
HL-281	RH-II CROSS OVER ASSY	3186
HL-282	RH-II CROSS OVER ASSY	3186
HL-283	RH-II CROSS OVER ASSY	3186
HL-284	RH-I CROSS OVER ASSY	3421
HL-285	RH-I CROSS OVER ASSY	3421
HL-286	RH-I CROSS OVER ASSY	3121
HL-301	LINKS FOR EVAP. MODULES- HP FRONT LEFT	1735
HL-302	LINKS FOR EVAP. MODULES- HP FRONT MIDDLE	3000
HL-303	LINKS FOR EVAP. MODULES- HP FRONT RIGHT	1735
HL-304	LINKS FOR EVAP. MODULES- HP REAR LEFT	2932
HL-305	LINKS FOR EVAP. MODULES- HP REAR MIDDLE	3000
HL-306	LINKS FOR EVAP. MODULES- HP REAR RIGHT	2932
HL-311	LINKS FOR EVAP. MODULES- IP FRONT LEFT	2095
HL-312	LINKS FOR EVAP. MODULES- IP FRONT MIDDLE	3000
HL-313	LINKS FOR EVAP. MODULES- IP FRONT RIGHT	2095
HL-314	LINKS FOR EVAP. MODULES- IP REAR LEFT	3000
HL-315	LINKS FOR EVAP. MODULES- IP REAR MIDDLE	3000
HL-316	LINKS FOR EVAP. MODULES- IP REAR RIGHT	3000
HL-321	LINKS FOR EVAP. MODULES- LP FRONT LEFT	2732
HL-322	LINKS FOR EVAP. MODULES- LP FRONT MIDDLE	3000
HL-323	LINKS FOR EVAP. MODULES- LP FRONT RIGHT	2732
HL-324	LINKS FOR EVAP. MODULES- LP REAR LEFT	3000
HL-325	LINKS FOR EVAP. MODULES- LP REAR MIDDLE	3000
HL-326	LINKS FOR EVAP. MODULES- LP REAR RIGHT	3000
HL-331	HP SH MODULE COMPONENTS	900
HL-332	HP SH MODULE COMPONENTS	900
HL-333	HP SH MODULE COMPONENTS	900
HL-351	HP ECO-III MODULE COMPONENTS (FRONT)	2200
HL-352	HP ECO-III MODULE COMPONENTS (FRONT)	2200
HL-353	HP ECO-III MODULE COMPONENTS (FRONT)	2200
HL-354	HP ECO-III MODULE COMPONENTS (REAR)	2200
HL-355	HP ECO-III MODULE COMPONENTS (REAR)	2200
HL-356	HP ECO-III MODULE COMPONENTS (REAR)	2200
HL-357	HP ECO-II MODULE COMPONENTS	2200
HL-358	HP ECO-II MODULE COMPONENTS	2200
HL-359	HP ECO-II MODULE COMPONENTS	2200
HL-371	LINKS FOR CPH MODULES- HP FRONT LEFT	4237
HL-372	LINKS FOR CPH MODULES- HP FRONT MIDDLE	3000
HL-373	LINKS FOR CPH MODULES- HP FRONT RIGHT	4237
	SUB TOTAL (2)	**3067707**
3) NON PRESSURE PARTS		
24-220	LP SAFETY VALVE ESCAPE PIPING	1600
24-225	LP SAFETY VALVE ESCAPE PIPING SUPPORTS	2000

24-285	LP SAFETY VALVE SILENCERS	2192
24-290	LP START-UP VENT SILENCER	548
24-320	IP SAFETY VALVE ESCAPE PIPING	3500
24-325	IP SAFETY VALVE ESCAPE PIPING SUPPORTS	2500
24-385	IP SAFETY VALVE SILENCERS	13092
24-390	IP START-UP VENT SILENCER	548
24-420	HP SAFETY VALVE ESCAPE	5000
24-425	HP SAFETY VALVE ESCAPE PIPING SUPPORTS	3500
24-485	HP SAFETY VALVE SILENCER	7081
24-490	HP START-UP-VENT SILENCER	2718
28-700	PINS AND B P S COMPONENTS	11739
48-200	INSTRUMENT TAPPINGS	300
48-422	HRSG INLET DUCT	61000
48-424	EXP. JOINT HRSG INLET DUCT	1000
48-452	DUCT BOILER OUTLET	12377
48-454	EXP.PIECES BOILER OUTLET	1900
48-482	DISTRIBUTION GRID	11000
48-493	STACK CLOSURE DAMPER	10000
48-700	BULKED BPS COMPONENTS	100
48-993	ERECTION MATERIALS	1703
HL-098	LOOSE COMPONENTS- DUCT	47905
HL-501	SIDE CASING S1 - S2	7723
HL-502	SIDE CASING S2-S3	7593
HL-503	SIDE CASING S3 - S4	7593
HL-504	SIDE CASING S4 - S5	6148
HL-505	SIDE CASING S5 – S6	6148
HL-506	SIDE CASING S6 – S7	6148
HL-507	SIDE CASING S7 - S8	6148
HL-508	SIDE CASING S8 - S9	6148
HL-509	SIDE CASING S9 -S10	6148
HL-510	SIDE CASING S10 -S11	12297
HL-601	TOP & BOTTOM CASING S1 - S2	8426
HL-602	TOP & BOTTOM CASING S2- S3	6035
HL-603	TOP & BOTTOM CASING S3 - S4	6017
HL-604	TOP & BOTTOM CASING S4 - S5	5362
HL-605	TOP & BOTTOM CASING S5 – S6	5362
HL-606	TOP & BOTTOM CASING S6 – S7	5362
HL-607	TOP & BOTTOM CASING S7- S8	5390
HL-608	TOP & BOTTOM CASING S8 - S9	5350
HL-609	TOP & BOTTOM CASING S9 -S10	5390
HL-610	TOP & BOTTOM CASING S10 -S11	13017
xx-xxx	HP & LP DOSING EQUIPMENTS	10000
	SUB TOTAL (3)	**351108**
4) POWER CYCLE PIPING, REGENERATIVE CYCLE PIPING, TANKS AND VESSELS ETC		
12-851	HP MAIN STEAM LINE	5300
12-854	LP MAIN STEAM LINE	1300
12-856	IP MAIN STEAM LINE	1800
80-145	EXHAUSTS AND VENTS	4000

80-273	BLOW DOWN SYSTEM VALVES	500
80-274	CBD TANK SAFETY VALVE	50
80-992	IMPORTED ELECTRODES	3
81-005	IBD TANK	3500
81-011	CBD TANK(SUD DELIVERY)	3000
81-411	BLOW DOWN TANK TUBULAR LEVEL GUAGE	120
81-413	BDT CONTROL VALVE(SUB-DELIVERY)	100
80-304	MS HEADER TO HPBP VALVE	12500
80307	HP & LP BYPASS WARM UP	2800
80310	HRH FROM REHEATER TO INTERCEPTOR VALVE	148000
80312	LPBP VALVE UPSTREAM & DOWNSTREAM	64000
80320	CRH FROM TURBINE TO REHEATER	62000
80321	HPBP VALVE TO CRH PIPING	17000
80345	AUX STEAM TO DEAERATING HEATER	8100
80349	AUX STEAM TO GLAND SEALS - TG SCOPE	200
80359	STEAM FROM PROCESS BLR	59000
80388	CONDENSER AIR EVACUATION PIPING	2500
80392	GS COOLER LEAK OFF TO ATMOSPHERE	700
80400	CONDENSATE SUCTION	5000
80401	CD FROM PUMP TO LPH1/DC INLET TEE&RECIR	2500
80402	CD FROM LPH1/DC INLET TEE TO TG TP	40000
80407	CONDENSATE FOR SEALING OF VACUUM	2000
80408	CONDENSATE DUMP FROM HEADER	3000
80417	BOILER FEED DISCHARGE PIPING	42100
80420	BOILER FEED PUMP SUCTION	4100
80421	BOILER FEED PUMP RECIRCULATION	6800
80429	BOILER FILLING PIPING	24400
80430	SPRAY WATER TO HPBP	4500
80434	UNLISTED SPRAY WATER - SG SCOPE	500
80436	SPRAY WATER TO LPBP DESH	2400
80438	GLAND COOLER DRAIN TO CONDENSER	200
80446	DEAERATING HEATER OVER FLOW AND DRAIN	7200
80449	TG CYCLE PIPING DRAINS & VENTS	1300
80452	HP PIPING DRAINS - SG SCOPE	2200
80453	LP PIPING DRAINS - SG SCOPE	3100
80473	DEMINERALISED WATER SYSTEM	19100
80496	DRAIN FLASH TANK VENT TO COND.	750
80600	HIGH PRESSURE DOSING PIPING	1100
80601	LOW PRESSURE DOSING PIPING	300
80612	SERVICE AIR FOR INDIVIDUAL UNITS (COMMON FOR HRSG, GT & STG)	11000
80616	INSTRUMENT AIR FOR INDIVIDUAL UNITS (COMMON FOR HRSG, GT & STG)	13000
80922	H&S FOR LIGHT UP - NON STEAM LINES	110000
80933	H&S FOR LP PIPING (PART)	10000
80992	IMPORTED ELECTRODES	300
81415	TEST THERMOWELLS	400
XXXXX	HP BYPASS SYSTEM, IP BYPASS SYSTEM AND LP BYPASS SYSTEM VALVES WITH PIPINGS, ASSOCIATED AUX. AND FITTINGS	7000
XXXXX	PEM SUPPLIED VALVES & SPECIALITIES (APPROX.)	50000
XXXXX	TRICHY VALVES DIVISION SUPPLY (APPROX.)	30000
	SUB TOTAL (4)	**800723**
5) LINING & INSULATION		
32-010	FIXING COMP. INLET DUCT SIDE	3700

32-110	FIXING COMP. INLET DUCT TOP	4509
32-210	FIXING COMP. INLET DUCT BOTTOM	2942
32-310	FIXING COMP. CASING -SH	4425
32-410	FIXING COMP. CASING -HP EVAP	7094
32-510	FIXING COMP. CASING -IP EVAP	6178
32-520	FIXING COMP. CASING -LP EVAP	5493
32-610	FIXING COMP. PIPING INSULATION	30000
32-710	FIXING COMP. CASING -HP ECO	2573
32-720	FIXING COMP. CASING -IP EVAP	3263
32-810	FIXING COMP. OUTLET DUCT	1778
32-910	FIXING COMP. CASING -CPH	5503
32-993	ERECTION MATERIALS	941
33-021	I D CERAMIC WOOL	84216
33-621	MINERAL WOOL FOR PIPING	51000
33-970	MISC. EQIPMENTS EXPANSION METAL	1050
33-975	SEALING COMPONENTS	200
37-810	OUTER CASING SHEET	19000
XX-XXX	INSULATION, CLADDING SHEET & ANCILLARY MATERIALS FROM BHEL PEM & HYDERABAD	
	BONDED MINERAL AND WOOL MATTRESSES	112000
	ALUMINIUM SHEET	27000
	ANCILLARY MATERIALS	13000
	SUB TOTAL (5)	**385865**
6) CHIMNEY		
87-010	CHIMNEY FDN MATL.	20000
87-100	CHIMNEY SHELL	337500
87-150	CHIMNEY STRAKES	47500
87-200	PAINTER'S TROLLY	3000
87-300	PLATFORMS &LADDERS	10500
87-930	AVIATION LAMPS & LIGHTNING ARRESTOR	1000
87-950	CHIMNEY INSULATION	20500
87-960	CHIMNEY INSULATION-FIXING COMPONENTS	10000
	SUB TOTAL (6)	**450000**
	GRAND TOTAL	**6332399**

SUMMARY OF WEIGHT DETAILS:

Sl. No.	Package	Weight (Kg)	Rounded off WT (MT)
1	Structures	12776996	1277
2	Pressure Part Incl. Heat Transfer Modules	3067707	3068
3	Non Pressure Parts	351108	351
4	Power Cycle Piping, Regenerative Cycle Piping, Tanks & Vessels	800723	800
5	Lining & Insulation	385865	386
6	Chimney	450000	450
	Total Weight	**6332399**	**6332**

NOTE:

1. WEIGHT AND DIMENSIONS ARE APPROXIMATE. THE WORK SHALL BE CARRIED OUT AS PER THE SCOPE AND AS MATERIALS SUPPLIED AT SITE.

2. BESIDES PRODUCT GROUPS INDICATED ABOVE, THERE IS LIKELIHOOD OF ADDITION OF NEW PRODUCT GROUPS BY BHEL's UNIT FOR RELEASE OF SOME ITEMS, INTEGRAL TO THIS WORK. TENDERERS' QUOTED UNIT RATES SHALL BE APPLICABLE FOR SUCH PRODUCT GROUPS ALSO.

3. BESIDES THE ABOVE, WEIGHT & SCOPE OF ALL TEMPORARY PIPING, VALVES, TANKS AND OTHER MISCELLANEOUS EQUIPMENTS ETC. FOR CARRYING OUT HYDRAULIC TEST, CHEMICAL CLEANING / EDTA CLEANING, STEAM BLOWING AND OTHER TESTS, AS STATED ELSEWHERE WILL GET ADDED.

4. BHEL'S DECISION WITH REGARD TO CLASSIFICATION OF ANY PRODUCT GROUP TO ANY ITEM RATE SHALL BE FINAL AND BINDING ON THE CONTRACTOR.

5. THE ERECTION OF GAS TURBINE & STEAM TURBINE SETS WITH AUXILIARIES, DEAERATORS, WHERE APPLICATION OF THERMAL INSULATION IS TO BE DONE BY CONTRACTOR UNDER THESE TENDER SPECIFICATIONS WILL BE ERECTED BY OTHER AGENCY. CONTRACTOR SHALL CARRY OUT THERMAL INSULATION WORK WITH PROPER PALLNING AND CO-ORDINATION AND DECISION OF BHEL ENGINEER AT SITE.

6. SITE WELD JOINTS INCLUDING THE WELDING, RADIOGRAPHY, NDE TESTS, PRE-HEATING & POSTING ETC. FOR HP & LP JOINTS FOR ALL TYPES OF PIPINGS AND SYSTEMS SHALL BE AS PER DRAWING REQUIREMENT AND ACTUAL WORK INVOLVED AT SITE SHALL BE THE PART OF SCOPE OF WORK OF PIPING AND RESPECTIVE SYSYEMS. THERE SHALL NOT BE ANY SEPARATE PAYMENT FOR SITE WELD JOINTS.

7. THE WEIGHTS OF FILLER WIRES, SPARES, CONSUMABLES ETC. ISSUED BY BHEL FREE OF CHARGES, SHALL NOT BE CONSIDERED IN TONNAGE WEIGHT FOR THE PURPOSE OF PAYMENT.

8. FOLLOWING ADDITIONAL INFORMATIONS ARE FURNISHED TO MAKE THE CONTRACTOR TO UNDERSTAND THE SCOPE OF WORK:

   (I) THE MAIN STEAM PIPING AND HP BYPASS PIPING IS OF P-91 MATERIAL.

   (II) STAINLESS STEEL SHEETING WORK OF ABOUT 32 MT IS INVOLVED IN SHEETING & CASING WORK OF INLET DUCTS & CASING AND THIS MATERIAL IS INCLUDED IN PGMA-32-010, 32-110, 32-210, 32-310, 32-410, 32-510 AND 32-520.

APPENDIX-II

DRAWINGS ATTACHED AS PART OF TENDER DOCUMENT

1. GENERAL ARRANGEMENT OF BOILER ELEVATION **– 0-00-561-93318 (REV. – 01)**

2. GENERAL ARRANGEMENT OF BOILER PLAN **– 0-00-561-93319 (REV. -01)**

NOTE:
THE ABOVE DRAWINGS ARE PROVIDED ONLY FOR INFORMATION AND WORK HAS TO BE DONE WITH REFERENCE TO THE LATEST APPLICABLE DRAWING.

Above drawings are not hosted in the web-page. Bidders are requested to obtain these drawings from BHEL PSWR Nagpur.

APPENDIX-III

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

SL.NO.	DESCRIPTION & CAPACITY OF T&P	QUANTITY	REMARKS
01	STEAM BLOWING VALVE SET WITH ACTUATOR	1 SET	
02	PIPING, VALVES & FITTINGS, SUPPORTING STRUCTURES, PLATES/ TANKS FOR TEMPORARY SYSTEMS FOR HYD TEST, CHEMICAL CLEANING, STEAM BLOWING ETC.	1 SET	TO SUIT SITE REQUIREMENT.
03	CHEMICAL CIRCULATION PUMPS FOR CHEMICAL CLEANING / EDTA CLEANING	2 SETS/ AS PER REQUMNT.	TO SUIT SITE REQUIREMENT.
04	INDUCTION HEATING M/C	2 SETS	REFER CL. 4.3.2.8

APPENDIX-IV

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

A: TOOL & PLANTS

SL. NO.	DESCRIPTION OF EQUIPMENTS	CAPACITY	MINIMUM QUANTITY	REMARKS
01	CRAWLER CRANE WITH SUITABLE BOOM LENGTH AND JIB TO FACILITATE ERECTION OF MODULES, DRUMS AND CHIMNEY.	SEE SECTION-5 IN THIS REGARD	1 NO.	REFER SECTION-5 CLAUSE 5.2.11 FOR FURTHER DETAILS.
02	CRAWLER CRANE	75 T	1 NO.	TO BE DEPLOYED FROM THE START OF ERECTION
03	CRAWLER CRANE	18 T	1 NO.	TO BE DEPLOYED FROM THE START OF ERECTION
04	MOBILE PICK AND CARRY CRANE	10/8 TON	01	TO BE DEPLOYED FROM THE START OF ERECTION
05	TRAILER WITH HORSE	15 TON / 20 TON	01	TO BE DEPLOYED FROM THE START OF ERECTION
06	AIR COMPRESSOR (ELECTRIC)	140 CFM	01	
07	TIG WELDING SET	-	4 NOS. AND FURTHER AS PER REQUIREMENT	
08	3 ph DISTRIBUTION BOARD WITH COMPLETE SET UP FOR DRAWL OF CONSTRUCTION POWER & FITTED WITH ENERGY METER	600 Amp	AS PER REQUIREMENT	
09	PRE HEATING / STRESS RELIEVING SET (HEATING CONTROL PANEL, CABLES, HEATING ELEMENTS ETC.)	AS PER REQUIREMENT	AS PER REQUIREMENT	
10	RADIOGRAPHY ARRANGEMENT INCLUDING THE SOURCE	IR 192	AS PER REQUIREMENT	
11	WELDING GENERATOR	300 AMPS	15 NOS. AND	

	(ELECTRIC & DIESEL)		FURTHER AS PER REQUIREMENT	
12	RADIOGRAPHY FILM VIEWER	AS PER REQMT	1 NO.	
13	ELECTRIC WINCH	3 TON / 2 TON	AS PER REQMNT	
14	ELECTRIC CABLE FOR DRAWAL & DISTRIBUTION OF CONSTRUCTION POWER	AS PER SITE REQUIREMENT	AS PER SITE REQUIREMENT	
15	PIPE BENDING MACHINE – HAND OPERATED	UP TO 50 mm Nb PIPES	AS PER SITE REQUIREMENT	
16	BAKING OVEN AND HOLDING OVEN WITH THERMOSTAT AND TEMPERATURE GAUGE FOR BAKING COATED WELDING ELECTRODES	AS PER REQUIREMENT	01 EACH	
17	PORTABLE OVEN FOR COATED WELDING ELECTRODES	AS PER REQUIREMENT	15	
18	ELECTRIC MOTOR DRIVEN HYDRAULIC TEST PUMP WITH DRIVE AND STARTER ETC.	400 Kg/Cm^2 250 Kg/Cm^2	1 NO. 1 NO.	
19	SCAFFOLDING MATERIALS (SCAFFOLDING PIPES WITH CLAMPS ETC.)	ADEQUATE TO SUIT THE REQUIREMENT	800 SETS AND FURTHER AS PER REQUIREMENT	
20	ALU. SHEET CLAD PROFILE MAKING MACHINE	AS PER REQUIREMENT	AS REQUIRED	
21	HAND TOOLS, CUTTING TOOLS GRINDING MACHINES ETC	AS PER REQUIREMENT	AS REQUIRED	
22	NIBBLING MACHINE	AS PER REQUIREMENT	AS REQUIRED	
23	SHEARING MACHINE	AS PER REQUIREMENT	AS REQUIRED	

NOTE:

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

B: MEASURING AND MONITORING DEVISES (MMD):

AS PER REQUIREMENT TO BE FINALIZED AT SITE.

APPENDIX-V

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

SN	CATEGORY	MONTHS											
		1	2	3	4	5	6	7	8	9	10	11	12
01	RESIDENT ENGINEER												
02	ERECTION ENGINEERS												
03	ERECTION SUPERVISORS												
04	QUALITY ASSURANCE ENGINEER												
05	SAFETY ENGINEER												
06	MATL MANAGEMENT SUPERVISORS												
07	HIGH PRESSURE WELDERS INCLUDING P-91 MATL WELDER												
08	STRUCTURAL & OTHER WELDERS												
09	FITTERS												
10	CRANE OPERATOR												
11	TRUCK/TRAILER DRIVERS												
12	STORE KEEPERS												
13	ELECTRICIANS												
14	SCAFFOLDERS, LAGGERS, FITTERS FOR L&I WORK												
15	SEMISKILLED/ UNSKILLED WORKERS												
	MONTH WISE TOTAL												

SIGNATURE OF TENDERER

DATE:

APPENDIX–VI
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	And onward		
01	CRAWLER CRANE WITH FULL BOOM LENGTH AND JIB TO FACILITATE ERECTION AND PLACEMENT OF DRUMS LIFTING.(400-600T)												
02	CRAWLER CRANE WITH FULL BOOM LENGTH AND JIB TO FACILITATE ERECTION OF MODULES AND CHIMNEY (150-180T)												
03	CRAWLER CRANE – CAP 75 T WITH SET OF FULL BOOM AND JIB												
04	CRAWLER CRANE – CAP 18 T												
05	MOBILE PICK AND CARRY CRANE 10/8 T												
06	TRAILER WITH HORSE – 15/20 T												
08	AIR COMPRESSOR (ELECTRIC) – 7 CFM												
09	TIG WELDING SET												
10	PRE HEATING / STRESS RELIEVING SET (CONTROL PANEL, CABLES, HEATING ELEMENTS ETC.)												
11	WELDING GENERATOR												
12	ELECTRIC WINCH 3/5 T												
13	ELECTRIC MOTOR DRIVEN HYDRAULIC TEST PUMP WITH DRIVE AND STARTER ETC - 400 Kg/CM^2 - 1 No.												
14	ELECTRIC MOTOR DRIVEN HYDRAULIC TEST PUMP WITH DRIVE AND STARTER ETC -250 Kg/CM^2 – 1 No.												
15	PORTABLE ELECTRODE CARRYING OVENS												
16	SCAFFOLDING PIPES WITH CLAMPS ETC FOR APPLICATION OF LINING & INSULATION												

NOTE: REFER APPENDIX-IV (MAJOR TOOLS AND PLANTS & MMD TO BE DEPLOYED BY THE CONTRACTOR) FOR REFERENCE AND TENTATIVE QUANTITY REQUIREMENT.

Date :

SIGNATURE OF THE TENDERER

APPENDIX-VII
CONCURRENT COMMITMENTS

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

SIGNATURE OF THE TENDERER

DATE:

APPENDIX-VIII

ANALYSIS OF UNIT RATE QUOTED

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

SIGNATURE OF THE TENDERER

DATE:

13.0 This section defines the technical requirements for surface preparation selection and application of paints on equipment, vessels, machinery, piping, ducts etc. However, manufacturers shall follow their standard procedures for painting their equipment. The Bidder shall submit a detailed painting procedure for approval of Employer / Employer's Representative after the award of contract.

13.1 The following surface and material shall require painting:

(a) All un-insulated carbon steel and alloy steel equipment like columns, vessels, drums, storage tanks, heat exchangers etc.

(b) All un-insulated carbon steel and low alloy piping, fitting and valves (including painting of identification marks).

(c) All pipe structural steel supports, walkways, platforms, hand rails, ladders etc.

13.2 The following surfaces and material shall not require painting:

(a) Non-ferrous materials

(b) Austenitic stainless steel

(c) Plastic and / or plastic coated materials

(d) Insulated surface of equipment and pipes except colour coating wherever required.

(e) Painted equipment like blowers, pumps, valves, etc., with finishing coats in good condition and with matching colour-code.

13.3 **Codes and Standards**

Painting of equipment shall be carried out as per the specifications indicated below and shall conform to the relevant IS specification for the material and workmanship.

The following Indian Standards may be referred to carrying out the painting job.

IS : 5	:	Colours for ready mixed paints and enamels
IS : 1303	:	Glossary of terms relating to paints
IS : 2379	:	Colour code for identification of pipelines.
IS : 2395	:	Code of practice for finishing of concrete, masonry and plaster surfaces (Parts I and II)

IS : 2338	:	Code of practice for finishing of wood and wood based materials (Parts I & II)
IS : 158	:	Ready mixed paint, brushing, bituminous, black, lead free, acid, alkali, water and heat resisting
IS : 2074	:	Ready mixed paint, air drying, red oxide zinc chrome, and priming.
IS : 104	:	Ready mixed paint, brushing, zinc chrome, priming
IS : 2932	:	Enamel, synthetic, exterior (a) undercoating (b) Finishing.
SIS : 55900	:	Swedish standard for blasting

13.4 **Surface Preparation**

The surface shall be prepared in a manner suitable for coatings. Chemical derusters or rust converters shall not be applied. Acid cleaning is subject to approval of Purchaser / Purchaser representative.

13.4.1 **Blasting**

The surface of the part / component shall be blasted before the coating material is applied.

Unless otherwise specified in the documents, the surface shall satisfy the following requirements after blasting:

(a) Blasting according to SIS 055900, Grade Sa-$2^{1}/2$.

Depending on production flow, weldable, ethyl zinc silicate shop primer, dry film thickness 15 – 25 microns shall be used.

13.4.2 **Manual Rust Removal**

Manual rust removal shall be allowed for welded zones and for touching up installed components.

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13.4.3 **Cleaning**

Removal of impurity

	Impurity	Removal
(a)	Dust, loose deposits	Vacuum-cleaning, brushing
(b)	Adhesive deposits	Power brushing
(c)	Oils, greasy impurities	Wet blasting, use of detergent additives by agreement
(d)	Salt deposits	Rinsing
(e)	Markings (e.g., felt tip pen)	Organic solvents to manufacturer's specifications e.g., Trichloro trifluoro ethane and solvents containing acetone (renew solvent and rag frequently).

13.5 **Processing**

13.5.1 **General**

Application Conditions

The primer shall be applied to properly prepared surfaces only. The specifications of the coating material manufacturers shall be observed. The minimum temperature shall be $+5^{0}C$ and the relative humidity shall not exceed 80%. The temperature of the work piece shall be atleast 3 ^{0}C above dew point.

13.5.2 **Application Procedure**

The primer shall be applied by means of brush or by spray. The top coats shall be applied by means of brush, roller or by spray.

At points where coating application is interrupted, the individual layers shall be adequately stepped to ensure proper layer sequence when coating operations are resumed.

13.5.3 **Touching Up**

Before each layer is applied, previous coating shall be touched up where necessary by way of rust removal and cleaning, according coating manufacturer's specifications. The final top coat shall be reapplied completely, if required.

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13.5.4 **Uncoated Surfaces**

Moving parts of machines (e.g., stems, shafts, sliding and locating bearings), nameplates, instruments and sealing surface shall not be coated. Welds shall be left free of coating upto a distance of 30 mm on each side of the weld edge until erection and weld examinations, if any, have been completed.

13.5.5 **Bond Strength**

The pull-off stress determined using the pull-off test method for adhesion shall be not less than 1.5 N/mm^2, according to ISO 4624.

13.6 **Surface Conditions of Coating Surfaces**

The coating surface shall have a uniform film thickness, shade and gloss and shall be free from inclusions, sags and wrinkles.

13.7 **Coating Systems**

13.7.1 **General Requirements for Coating Systems**

Coating materials according to SSPC, BS 5493 or DIN 55 928 shall be used. Intermediate coats are to be pigmented with micaceous iron oxide. The materials shall be matched with each other so that they are compatible. Coatings deviating this specification shall be subject to approval. Standards of surface preparation and painting shall give a time to first maintenance of 10 years.

The colour and gloss of top coats shall be in accordance with sub-clause suggested colour codes for painting (Sub-clause 13.10).

13.7.2 **Standard Coating System (External Coatings)**

(a) For painting of civil structures in general and other steel structures not covered below shall be carried out as specified in the Civil Section D4.3 of the specification

(b) **Galvanised iron and steel requiring paint finish at site**

(i) At site

Surface Treatment

Mechanical cleaning from contaminants by means of washing or steam jetting and sweep blasting with fine sand or etching (T-Wash).

Touch-up mechanical damages:

De rusting St 3 and application of high build epoxy primer DFT 80 µm.

Finish coating:

Analogous to standard painting scheme

13.7.3 **Painting of indoor components such as valves, pumps, motors, electrical parts, tanks etc.**

At works

Surface preparation:

Blasting according to SIS 055900: grade Sa 2 ½. Depending on production flow, a weldable, inorganic ethyl zinc silicate shop primer dry film thickness 15 – 25 µm, may be used.

Prime coat:

Two (2) layers of zinc phosphate epoxy, total dry film thickness 75 µm.

At site

Thorough cleaning to remove oil, grease, dirt and any other contaminants. Derusting of all mechanical damages according to SIS 055900 Grade ST3. Touch up with 1 pack inorganic ethyl zinc silicate, dry film thickness 50 µm

Finish coat:

Two (2) layers of a 2 pack epoxy polyamide glossy, according to colour specification, dry film thickness 60 µm.

Total system dry film thickness 135 µm.

Remarks:

Equipment coated with a standard application system can be accepted if the quality of this application system is corresponding with the quality of the above mentioned system.

13.7.4 **Painting of Outdoors equipments (external surfaces) such as piping, valves, pumps, motors, electrical parts, tanks etc.**

Weather exposure, weather resistance, temperature upto 120°C as per 13.7.1 and 13.7.3 however.

Surface Preparation:

Blasting according to SIS 055900: grade Sa 2 ½. Depending on production flow, a weldable, inorganic ethyl zinc silicate shop primer dry film thickness 15-25 µm, may be used.

Prime Coat:

Two (2) layers of zinc phosphate epoxy, total dry film thickness 75 µm.

Intermediate Coat:

One (1) layer 2 pack high build epoxy polyamide Mio, dry film thickness 100 µm.

Finish Coat:

One (1) layer of a 2 pack aliphatic polyurethane glossy minimum dry film thickness 50 µm. Total system dry film thickness 225 µm.

13.7.5 **Special Coating System (External Coatings)**

(a) Parts exposed to temperatures above 120°C, upto 200°C, not insulated

(i) At works

Surface Preparation:

Blasting according standard SIS 55900 Grade Sa 2½ and ISO 8501-1: 1988. Depending on production flow, a weldable, inorganic ethyl zinc silicate shop primer, dry film thickness 15-25 µm, may be used.

Prime coat
Inorganic ethyl zinc silicate, dry film thickness 75 µm.

(i) At site

Pre-treatment:

Derusting of all mechanical damages, according to ISO 8501-1: 1989, grade St 3 Touch-up with 1 pack inorganic ethyl zinc silicate, dry film thickness 50 µm.
Removal of all decontaminants from prime coat.

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Intermediate Coat:

1 pack silicon acrylic, dry film thickness 35 µm.

Final coat :

1 pack silicon acrylic, dry film thickness as 35 µm.
Total system dry film thickness 145 µm.
Final coat according to colour code.

(b) **Parts exposed to temperatures above 200°C, upto 400°C, not insulated**

(i) At works

Surface Preparation:

Blasting according to ISO 8501-1: 1988 grade Sa 2 1/2. Depending on production flow, a weldable, inorganic ethyl zinc silicate shop primer, dry film 15-25 µm, shall be used.

Prime coat:

Inorganic ethyl zinc silicate, dry film of thickness 75 µm.

(ii) At site

Pre-treatment:

Derusting of all mechanical damages, according standard Sa 2 1/2 to ISO 8501-1: 1988. Touch-up with coating system according to manufacturer's recommendations.

(c) **Insulated Parts, continuously exposed to condensing water or parts exposed to temperatures**

For parts that are provided with insulation on site.

(i) **Insulated parts, exposed to condensing water**

At works

Surface Preparations:

Blasting according standard Sa 2 1/2 to ISO 8501-1: 1988. Depending on production flow, a weldable, inorganic ethyl zinc silicate shop primer, dry film thickness 15-25 µm shall be used.

Prime coat:

Inorganic ethyl zinc silicate, dry film thickness 75µm.

(ii) **Insulated parts exposed to temperatures**

Parts, exposed to temperatures upto <400^{0}C at works

Surface Preparation:

Blasting according to standard Sa 2^1/2 to ISO 8501-1: 1988. Depending on production flow, a weldable, inorganic ethyl zinc silicate shop primer, dry film thickness 15-25 µm shall be used.

Parts, exposed to temperatures above 400^{0}C at works (Steam pipes, pressure tubes and parts for the HRSG, such as heating surfaces, heaters and super heaters reheaters, etc.)

Surface preparation:

Blasting according standard Sa 2^1/2 to ISO 8501-1: 1988.

Temporary primer:

Varnish.

(d) **Intermittent exposure due to condensing water / chemicals (Indoors)**

(i) At works

Surface Preparation:

Blasting according to standard Sa 2^1/2 to ISO 8501-1: 1988. Depending on production flow, a weldable, inorganic ethyl zinc silicate shop primer, dry film thickness 15-25 µm may be used.

Prime Coat:

Two layers of zinc phosphate epoxy primer total dry film thickness greater than or equal to 75 µm.

(ii) At site

Pretreatment:

Derusting of all mechanical damages, according standard Sa 3 to ISO 8501-1: 1988, touch-up with 2 pack high build epoxy with volume solid content of more than 85%, 75 µm.

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Intermediate Coat:

2 pack high build epoxy, dry film thickness 80 µm.

Finish coat:

2 pack epoxy according to colour appearance, dry film thickness of 50 µm.

Total system dry film thickness 205 µm.

When exposed to weathering, weather resistance finish coat shall be applied.

(e) **Water exposure**

Surfaces permanently or predominantly in contact with water.

(i) At site / works

Pretreatment:

Removal of all welding pearls.

Blasting according standard Sa 3 to ISO 8501-1: 1988.

Coat:

4 coats 2 pack coal-tar-epoxy, dry film thickness 125 µm each.

Total system dry film thickness 500 µm.

Touch-up after erection as required.

13.7.6 **Buried / underground piping system**

(a) Where pipelines are buried, underground protection shall be provided for the piping system as indicated in any one of the methods given below:

(i) Coal tar primer, coal tar enamel, inner wrap of fibre glass, final outer wrap of enamel impregnated fibre glass. Total thickness of coating shall not be less than 4.0 mm.

(ii) With anti-corrosive tape of minimum 4 mm thick conforming to IS-10221 and AWWA C 203-93.

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(b) Pipe surfaces shall be cleaned by shot or sand blasting before application.

(c) Tests to be carried out after application

(i) Bond / Adhesion test

(ii) Holiday test

13.8 **INTERNAL COATINGS**

13.8.1 **Tanks (Internal Surfaces) as specified in relevant sections of specification**

Industrial, deionised, demineralised and potable water upto 60^0C pH range: 4.5 – 9.5.

Blasting according to ISO 8501-1: 1988, grade Sa $2^1/2$.

Prime coat:

Two layers of zinc phosphate epoxy primer total DFT greater than or equal to 75 µm.

Pretreatment:

Derusting of all mechanical damages, according to standard Sa 3 to ISO 8501-1:1998, touch up with 2 pack high build epoxy with volume solid content of more than 85%, 75 µm.

Intermediate coat:

2 pack high build epoxy, dry film thickness 80 µm.

Finish coats:

2 pack solvent free epoxy paint dry film thickness 150 µm per coat.

In case of service or potable water tanks, the coating material selected shall not taint the water.

QA / QC procedure, including pinhole inspection, for shall be submitted for approval by Employer / Employer's Representative.

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13.8.2 **Rubber Lining of Pipes, Valves and Tanks as specified in relevant sections.**

(a) At works

Pretreatment:

Blasting according standard $2^1/2$ to ISO 8501-1 : 1988.

Rubber lining:

Hard-rubber 5mm for DM water applications, thickness greater than or equal to 3 mm for others. In case of failure of rubber lining for both pipes and vessels, the rubber lining shall be replaced by COROCOAT

13.9 **Painting for Electrical Items**

13.9.1 All the steel work shall be thoroughly cleaned of rust, scale, oil, grease, dirt and swarf by pickling, emulsion cleaning, etc. The sheet steel shall be phosphated / oven dried and then painted with two coats of zinc rich primer paint. After application of the primer, two coats of finishing synthetic enamel paint shall be applied. The colour of the finishing coats inside shall be glossy white and exterior of the treated sheet steel shall be shade 631 of IS-5 / RAL 7032 for all switchboard/MCC/ Distribution boards, control panels, etc.

13.9.2 All electrical equipment shall be given tropical and fungicidal treatment and outdoor equipment shall be provided with rain hood to prevent entry of rain water into the equipment.

13.9.3 Painting and galvanising requirements of switchyard structures are covered in Civil section D4 in Volume - III.

13.10 **Suggested Colour Codes for Painting**

Sl. No.	Item / Service	Colour	IS–5	Colour (Band)	IS - 5
13.10.1	Structures, platforms, galleries, ladders and handrails.	Dark Admirability Grey	632	-	-
13.10.2	Boiler casing, ducting	Nut Brown	413	-	-
13.10.3	Crane				
(a)	Crane structure	Golden Yellow	356	Black	-
(b)	Trolley and hook	Crimson	540	-	-

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13.10.4	Pump motors, compressors	Light Grey	631	-	-
13.10.5	Tanks (without insulation and cladding)				
(a)	Outdoor	Aluminium	-	-	-
(b)	Indoor	Light Grey	631	-	-
13.10.6	Vessels and all other proprietary equipment (without insulation and cladding)	Light Grey	631	-	-
13.10.7	Switchgear	Light Grey	631	-	-
13.10.8	Control and relay panels	Light Grey	631/ 7078 of IS1650	-	-
13.10.9	Turbines	Light Grey	631	-	-
13.10.10	Generators and exciter	Light Grey	631	-	-
13.10.11	Transformers	Aluminium	-	-	-
13.10.12	Machinery guards	Signal red	537	-	-
13.10.13	Piping (Without insulation and cladding)				
(a)	**Water System**				
(I)	Boiler feed	Sea Green	217	-	-
(ii)	Condensate	Sea Green	217	Light Brown	410
(iii)	DM Water	Sea Green	217	Light Orange	557
(iv)	Soft Water	Sea Green	217	French Blue	166
(v)	Bearing cooling water	Sea Green	217	French Blue	166
(vi)	Potable and filtered water	Sea Green	217	French Blue	166
(vii)	Service and clarified water	Sea Green	217	French Blue	166
(viii)	Cooling water	Sea Green	217	French Blue	166
(ix)	Raw water	Sea Green	217	White	

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(b)	**Air system**				
(i)	Station air	Sky Blue	101	-	-
(ii)	Control air	Sky Blue	101	White	-
(c)	**Oil system**				
(i)	Light oil (HSD)	Light Brown	410	French blue	166
(ii)	Lubricating oil	Light Brown	410	Light grey	631
(iii)	Transformer oil	Light Brown	410	Light Orange	557
(d)	**Gas system**				
(i)	Fuel gas (Regassified LNG)	Canary Yellow			
(ii)	Carbon dioxide	Canary Yellow	309	Light grey	631
(iii)	Hydrogen	Canary Yellow	309	Signal red	537
(e)	**Fire Services**	Fire red	536	-	-
(f)	**Effluent pipes**	Black	-	-	-
(g)	**Vacuum pipes**	Sky Blue	101	Black	-
(h)	**Drainage**	Black	-	-	-

NOTES

1. This colour code basically refers to IS: 2379 for piping with necessary modifications.

2. Where band colour is specified, same shall be provided at 10 metre intervals on long uninterrupted lines and also adjacent to valves and junctions.

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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	TIME SCHEDULE (MONTHS)	DATE OF ACTUAL COMPLETION OF WORK	REMARKS

SIGNATURE OF TENDERER WITH SEAL

- PLEASE USE ADDITIONAL SHEET IF NEEDED **IN THE SAME FORMAT.**
- PLEASE ENCLOSE COPIES OF WORK ORDERS INCLUDING DETAILED BILL OF QUANTITIES, COMPLETION CERTIFICATES IN SUPPORT OF THIS STATEMENT.