

TENDER SPECIFICATION

NO. BHE/PW/PUR/BORLI-PPE/563

COLLECTION OF MATERIALS FROM BHEL/CLIENT'S STORES/STORAGE YARD INCLUDING LOADING; TRANSPORTATION TO SITE; FABRICATION OF PIPING AT SITE, CONDUCTING POSITIVE MATERIAL IDENTIFICATION ON AS AND SS PIPES AND FITTINGS, WRAPPING AND COATING OF BURIED PIPES, ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING AND HANDING OVER OF ALL IBR INCLUDING POWER CYCLE PIPING, REGENERATIVE SYSTEM PIPING, NON-IBR HIGH PRESSURE AND LOW PRESSURE PIPING WITH ASSOCIATED FITTINGS, VALVES, SUPPORTS ETC

OF

3X33 MW UNITS

AT

BHARAT OMAN REFINERIES LTD;

3X33 MW, CFBC BASED CPP; BINA REFINERY PROJECT,

VILLAGE : AGASOD, TALUK : BINA

DISTT: SAGAR,

MADHYA PRADESH

PART I - TECHNICAL BID



BHARAT HEAVY ELECTRICALS LIMITED

(A GOVERNMENT OF INDIA UNDERTAKING)

POWER SECTOR : WESTERN REGION

345, KINGSWAY : NAGPUR 440 001

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LEGEND:

\$: Included in Tender Specifications Part-I. Hosted in BHEL web page (www.bhel.com) as file titled “**NIT+GCC-563**”.

@: Issued as separate hard copy booklet ‘Tender Specifications Part-II (Price Bid)’. Hosted in BHEL web page (www.bhel.com) as file titled “**PRICE BID-563**”

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-563**”

BHARAT HEAVY ELECTRICALS LIMITED

(A GOVERNMENT OF INDIA UNDERTAKING)

POWER SECTOR - WESTERN REGION

SHREEMOHINI COMPLEX

345, KINGS WAY - NAGPUR 440 001

FOR

COLLECTION OF MATERIALS FROM BHEL/CLIENT'S STORES/STORAGE YARD
INCLUDING LOADING; TRANSPORTATION TO SITE; FABRICATION OF PIPING AT SITE,
CONDUCTING POSITIVE MATERIAL IDENTIFICATION ON AS AND SS PIPES AND
FITTINGS, WRAPPING AND COATING OF BURRIED PIPES, ERECTION, TESTING,
ASSISTANCE FOR COMMISSIONING AND HANDING OVER OF ALL IBR INCLUDING
POWER CYCLE PIPING, REGENERATIVE SYSTEM PIPING, NON-IBR HIGH PRESSURE
AND LOW PRESSURE PIPING WITH ASSOCIATED FITTINGS, VALVES, SUPPORTS ETC

OF

3X33 MW UNITS

AT

BHARAT OMAN REFINERIES LTD;

3X33 MW, CFBC BASED CPP; BINA REFINERY PROJECT,

VILLAGE : AGASOD, TALUK : BINA

DISTT: SAGAR,

MADHYA PRADESH

EARNEST MONEY DEPOSIT Rs.200000.00 (Rs. TWO LAKHS ONLY)

LAST DATE AND TIME FOR
RECEIPT OF OFFERS

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

M/s.

.....

.....

PLEASE NOTE :

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

For Bharat Heavy Electricals Limited

Dy.. GEN MANAGER (PURCHASE)
PLACE: NAGPUR
DATE:

BHEL-PSWR-NAGPUR

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Part I : Technical Bid Specifications

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BHARAT HEAVY ELECTRICALS LIMITED
(A Government of India Undertaking)
POWER SECTOR - WESTERN REGION
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.

PROJECT INFORMATION

INTRODUCTION

M/s. BHARAT OMAN REFINERIES LIMITED, as Owner proposes to set up a CFBC based Captive Power Plant, at Bina in the state of Madhya Pradesh (M.P), India based on Petcock as feedstock. A Captive Power Plant (CPP) is to be installed to meet the Steam & Power requirements.

M/s. ENGINEERS INDIA LIMITED, New Delhi have been retained as Project Management Consultant for the project.

The Power Plant comprising of Steam & Power generation, Emergency Power supply system alongwith associated facilities and hook-up with the Refinery.

SITE LOCATION / SITE VISIT

SITE LOCATION

The site is located at an approximate distance of 10 -15 Km from Bina town. The nearest railway station is Agasod – Bina. The nearest port is Kandla, which is approx. 700 Km from the site. The nearest airport is at Bhopal, which is approx. 150 Km.

SITE VISIT

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.

Checklist

(vide Para 1.3 of section-I of general conditions of contract)

1	Name of the bidder with address		
2	Phone No. Fax No., E-mail address		
3	Name of the Contact Person		
4	Nature of the firm		
5	EMD details		
6	Validity of offer		
7	Mobilization time (not exceeding 30 days from tele LOI)		
8	Whether no deviation certificate furnished	Yes	No
9	Tenderer has visited the project site and acquainted with the site conditions	Yes	No
10	Details of concurrent jobs are furnished (as per appendix- IX)	Yes	No
11	Head quarter's organisation is furnished	Yes	No
12	Proposed site organisation is furnished	Yes	No
13	Names and particulars of Directors /Partners are furnished	Yes	No
14	Financial status of the company (annexure 'a' of GCC) is furnished	Yes	No
15	Profit & loss account for preceding three years is furnished	Yes	No
16	Latest solvency certificate from the banker is furnished (Issued by Nationalised Bank, Not older than 6 months)	Yes	No
17	Latest income tax clearance certificate is furnished	Yes	No
18	Manpower deployment plan (appendix-VIII) is furnished	Yes	No
19	Month wise deployment plan for major T&Ps (appendix-VII) is furnished	Yes	No
20	Whether all the pages of the tender documents are read, understood and signed	Yes	No

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21	Power of attorney Enclosed in favour of person making offer.	Yes	No
22	Bidder has familiarized himself with all Relevant local laws & Conditions.	Yes	No
23	Safety Requirement of this work in a Running plant premises has been understood.	Yes	No
24	Erection and Commissioning Programme.	Yes	No
25	WHETHER ALL THE PAGES OF THE TENDER DOCUMENTS ARE READ, UNDERSTOOD AND SIGNED	YES	NO

Note : strike off yes or no, as applicable

Date :

signature of bidder

DECLARATION SHEET

I, _____, HEREBY CERTIFY THAT ALL THE INFORMATION AND DATA FURNISHED BY ME WITH REGARD TO THE TENDER SPECIFICATION NO.BHE/PW/PUR/BORLI-PPE/563 ARE TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE. I HAVE GONE THROUGH THE SPECIFICATIONS, CONDITIONS AND STIPULATIONS IN DETAIL AND AGREE TO COMPLY WITH THE REQUIREMENTS AND INTENT OF THE SPECIFICATION. I FURTHER CERTIFY THAT I AM DULY AUTHORIZED REPRESENTATIVE OF THE UNDER-MENTIONED TENDERER AND A VALID POWER OF ATTORNEY TO THIS EFFECT IS ALSO ENCLOSED.

AUTHORISED REPRESENTATIVE'S SIGNATURE WITH
NAME AND ADDRESS

DATE:

TENDERER'S NAME AND ADDRESS

CERTIFICATE OF NO DEVIATION

TENDER SPECIFICATION NO.

BHE/PW/PUR/BORLI-PPE/563

I/WE, M/s

.....

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

SIGNATURE OF THE TENDERER

DATE:

SECTION-3
OFFER OF THE CONTRACTOR

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

DEAR SIR,

I/WE HEREBY OFFER TO CARRY OUT THE WORK DETAILED IN TENDER SPECIFICATION NO. BHE/PW/PUR/BORLI-PPE/563 ISSUED BY BHARAT HEAVY ELECTRICALS LIMITED, POWER SECTOR-WESTERN REGION, NAGPUR, IN ACCORDANCE WITH THE TERMS AND CONDITIONS THEREOF.

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

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

I/WE HAVE DEPOSITED / FORWARDED HERewith THE EARNEST MONEY DEPOSIT 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.

OR,

WE HAVE ALREADY DEPOSITED ONE TIME EMD OF Rs. 2,00,000/- (RUPEES TWO LACS ONLY), DETAILS OF WHICH ARE FURNISHED IN THE CHECK LIST.

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

PLACE:
DATE :

SIGNATURE OF TENDERER:
ADDRESS:

WITNESSES WITH THEIR ADDRESS

SIGNATURE

NAME

ADDRESS

SECTION-4

SPECIAL CONDITIONS OF CONTRACT

4.0 BROAD SCOPE OF WORK

THE SCOPE OF WORK COVERS THE COMPLETE WORK OF ALL HIGH PRESSURES AND LOW PRESSURE PIPING OF THE CAPTIVE POWER PLANT INCLUDING THOSE COVERED UNDER IBR PURVIEW. THE WORK IS MAINLY CATEGORISED AS FOLLOWS:

- 1) SITE FABRICATION, ERECTION TESTING AND COMMISSIONING OF HIGH AND LOW PRESSURE PIPING UNDER IBR PURVIEW
- 2) SITE FABRICATION, ERECTION TESTING AND COMMISSIONING OF NON-IBR HIGH AND LOW PRESSURE PIPING
- 3) PERMANENT MATERIAL IDENTIFICATION (PMI) OF PIPES AND FITTINGS OF ALLOY STEEL AND STAINLESS STEEL MATERIALS
- 4) WRAPPING AND COATING OF BURRIED PIPING

INDICATIVE LISTS OF LINES COVERED UNDER THE TWO CATEGORIES OF IBR AND NON-IBR ARE FURNISHED AS PART OF THESE SPECIFICATIONS FOR INFORMATION. IT IS TO BE NOTED THAT THE ABOVE MENTIONED SYSTEMS, SUB-SYSTEMS AND THEIR MATERIALS ARE THE PRESENT FORECAST AND AS THE ENGINEERING PROGRESSES SOME ADDITIONS, DELETIONS AND ALTERATIONS ARE EXPECTED. ACCORDINGLY ALL SUCH LINES WILL GET ADDED TO THE LIST MENTIONED ABOVE AND SHALL BECOME PART OF THIS WORK.

THE LATEST BOM FOR THE PIPE LINES IS FURNISHED IN RELEVANT APPENDIX AND IS ONLY FOR INFORMATION. THIS MAY, ON ACCOUNT OF CERTAIN CHANGES IN ENGINEERING MAY GET MODIFIED AND WORK SHALL BE DONE ACCORDINGLY.

THESE DETAILS ARE APPROXIMATE AND MEANT ONLY TO GIVE A GENERAL IDEA TO THE BIDDER ABOUT THE NATURE & MAGNITUDE OF THE WORK INVOLVED, ACTUAL QUANTUM AND TYPE OF EQUIPMENTS WILL BE BASED ON THE ERECTION DOCUMENTS, WHICH WILL BE FURNISHED IN THE COURSE OF ERECTION.

SOME OF THE APPLICABLE TECHNICAL SPECIFICATIONS OF EIL ARE ENCLOSED FOR READY REFERENCE OF THE BIDDER. OTHER SPECIFICATIONS WILL BE PROVIDED DURING THE COURSE OF EXECUTION OF WORK. IN CASE A CONFLICT IS NOTED BETWEEN VARIOUS DOCUMENT PROVIDED, MATTER SHALL BE REFERRED TO BHEL ENGINEER BEFORE

PROCEEDING ANY FURTHER. BHEL ENGINEERS' DECISION SHALL BE FINAL AND BINDING ON THE CONTRACTOR ON ALL SUCH MATTERS.

4.1.1 DETAILED SCOPE

4.1.1.1

COLLECTION & LOADING OF MATERIALS FROM BHEL'S & CLIENT'S STORES/STORAGE YARD, TRANSPORTATION TO SITE OF WORK INCLUDING TO PRE-ASSEMBLY/ FABRICATION YARD AND UNLOADING. AFTER THE COMPLETION OF FABRICATION/ PRE-ASSEMBLY; LOADING, TRANSPORTATION FROM PRE-ASSEMBLY AREA TO SITE OF WORK & UNLOADING

4.1.1.2

ALL PIPES WILL BE SUPPLIED IN STRAIGHT LENGTHS. COMPLETE FABRICATION FROM STRAIGHT PIPES OF ALL PIPING WITH NECESSARY BRANCH OFFS WITH DUE RE-INFORCEMENTS IF ANY, TAP-OFFS INCLUDING DRILLING AND WELDING OF STUBS ETC AS PER BHEL DRAWINGS, CUTTING OF PIPES TO REQUIRED LENGTH, EDGE PREPARATION FOR WELDING, PRE-ASSEMBLY, IF ANY; PRE-ERECTION CHECK OF COMPONENTS

4.1.1.3

ALL FITTINGS UP TO 24" WILL BE SUPPLIED LOOSE WHICH MAY REQUIRE EDGE PREPARATION AND ID/OD MATCHING WITH PIPES FOR WELDING. SEGMENTAL BENDS/ MITRE BENDS, REDUCERS AND TEES ABOVE 24" ARE TO BE FABRICATED AT SITE AS PART OF WORK.

4.1.1.4 IBR INTERACTION

CONTRACTOR SHALL BE SUPPLIED WITH ALL THE DRAWINGS FALLING UNDER THE PURVIEW OF INDIAN BOILER REGULATION DULY APPROVED BY THE BOILER INSPECTORATE. CONTRACTOR SHALL CARRY OUT THE FABRICATIONS, ERECTION AND TESTING & COMMISSIONING OF THESE PIPING AS PER REQUIREMENTS OF IBR AND TO THE ENTIRE SATISFACTION OF LOCAL BOILER INSPECTOR. CONTRACTOR SHALL ALSO OBTAIN ALL LICENSES/ PERMITS FOR DOING SUCH FABRICATIONS AT SITE, SET UP ALL THE FABRICATION FACILITY AND TESTING LAB AS CALLED FOR BY IBR IN THIS REGARD. CONTRACTOR SHALL ALSO GET, AT HIS OWN COST, APPROVAL OF BOILER INSPECTOR FOR ALL THE FABRICATION AND TESTING DONE BY HIM. ALL CERTIFICATES OF APPROVAL SHALL BE IN PROPER IBR FORMS. REFER ALSO SECTION-5.

4.1.1.5

ERECTION, LAYING IN RESPECTIVE DESIGNATED LOCATIONS, FIT-UP, ALIGNMENT, WELDING / BOLTING / FASTENING OF PIPES OF ALL SIZES AND ALL MATERIALS, VALVES, FITTINGS & STRAINER ETC SHALL BE DONE AS PER BHEL DRAWINGS.

4.1.1.6

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COMPLETE FABRICATION OF AUXILIARY SUPPORTING STRUCTURES, SUPPORTS, ANCHORS, GUIDES ETC FROM RAW STEEL AND ERECTION, ALIGNMENT, WELDING/ BOLTING/ FASTENING ETC OF THE SAME. ONLY THE HANGERS, U-CLAMPS AND FASTENERS WILL BE SUPPLIED READYMADE BY BHEL.

4.1.1.7

NON-DESTRUCTIVE EXAMINATION OF JOINTS WELDED AT SITE

4.1.1.8

HYDRO-STATIC & HYDRAULIC TEST, PRESSURE DECAY TESTING OF PIPING

4.1.1.9

PRE-COMMISSIONING CHECKS, BLOWING, FLUSHING ETC PRE-COMMISSIONING TESTING, TRIALS AND ASSISTANCE FOR COMMISSIONING

4.1.1.10 PLATFORMS, Crossovers & Canopies:

CONTRACTOR SHALL FABRICATE ACCESS PLATFORMS, LADDERS, Crossovers FOR SLEEPERS, AND CANOPIES AT SITE AS PER BHEL ENGINEERS' ADVICE. ALL MATERIALS SUCH AS STEEL SECTIONS, GRATING INCLUDING HANDRAILING ETC WILL BE PROVIDED BY BHEL IN RANDOM LENGTHS/ SIZES.

4.1.1.11 POSITIVE MATERIAL IDENTIFICATION (PMI)

CONTRACTOR SHALL ARRANGE TO CONDUCT, AS PER EIL SPECIFICATION, POSITIVE MATERIAL IDENTIFICATION TESTS TO THE EXTENT OF 100% OF ALL ALLOY STEEL AND STAINLESS STEEL PIPES AND FITTINGS. RELEVANT EIL SPECIFICATION IS ATTACHED FOR INFORMATION.

4.1.1.12 WRAPPING AND COATING

BURRIED PIPING HAVE TO BE PROTECTED BY APPLICATION OF WRAPPING AND COATING BEFORE ASSEMBLY AND LAYING OF THE PIPING. THIS SHALL BE DONE AS PER THE LATEST VERSION OF EIL SPECIFICATION. ALL THE MATERIALS, CONSUMABLES AND TOOLS & PLANTS REQUIRED ARE TO BE PROVIDED BY THE CONTRACTOR. RELEVANT EIL SPECIFICATION IS ATTACHED FOR INFORMATION.

4.1.1.13

PREPARATION AND SUBMISSION OF MARKED-UP (MANUAL UPDATION OF EXISTING ERECTION DRAWINGS, PREPARATION OF DRAWINGS/ SKETCHES FOR SITE-ROUTED PIPELINES) DRAWINGS FOR THE PURPOSE OF MAKING AS-BUILT DRAWINGS.

4.1.1.14

HANDING OVER

THE WORK SHALL BE DONE AS PER SPECIFICATIONS OF EIL AND SHALL CONFORM TO DIMENSIONS AND TOLERANCES SPECIFIED IN THE VARIOUS

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

4.1.2 GENERAL RESPONSIBILITIES

4.1.2.1

THE INTENT OF SPECIFICATION IS TO PROVIDE ERECTION 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.

4.1.2.2

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.

4.1.2.3

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, COORDINATING HIS WORK WITH OTHERS AND PROCEED IN A MANNER THAT SHALL NOT DELAY OR HINDER THE PROGRESS OF WORK AS A WHOLE.

4.1.2.4

CONTRACTOR SHALL ERECT 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 AND FRONTS, 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.

4.1.2.5

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 HE MUST ALSO DEPLOY ADEQUATE TRAINED, QUALIFIED AND EXPERIENCED SUPERVISORY STAFF AND SKILLED PERSONNEL.

4.1.2.6

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

4.1.2.7

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 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.

4.1.2.8

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.

4.1.2.9

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.

4.1.2.10

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

4.1.2.11

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.

4.1.2.12

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.

4.1.2.13

CONTRACTOR SHALL PLAN AND TRANSPORT EQUIPMENTS, COMPONENTS FROM STORAGE 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.

4.1.2.14

THE RATES QUOTED IN RATE SCHEDULE SHALL BE INCLUSIVE OF WELDING, BOLTING, FASTENING, JOINTING AND DESTRUCTIVE/NON-DESTRUCTIVE EXAMINATION (NDE) ETC AS APPLICABLE EXCEPT FOR NDE BY RADIOGRAPHY WHICH IS PAID AS SEPARATE ITEM AS PER PRESCRIBED RATE ELSEWHERE HEREIN.

4.1.2.15

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. HE SHALL EFFECTIVELY PROTECT THE FINISHED WORKS FROM ACTION OF WEATHER AND FROM DAMAGES OR DEFAACEMENT 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.

4.1.2.16 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, EXCEPTING THE PRIMER & PAINT, FOR THE ABOVE WORK SHALL BE PROVIDED BY BHEL.

4.1.2.17

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.

4.1.2.18

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.

4.1.2.19

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.

4.1.2.20

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%.

4.1.2.21

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.

4.1.2.22

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.

4.1.2.23

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.

4.1.2.24

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

4.1.2.25

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 AND DE-WATERING OF PIPES AND PITS.

4.1.2.26

PROVIDING BLANKING PLATES, DISHED ENDS, FABRICATION, FIT-UP, WELDING, OF REQUISITE BLANKS FOR CONDUCT OF HYDRAULIC TEST IS

PART OF WORK. CONTRACTOR SHALL ARRANGE DISHED ENDS FOR EACH SIZE OF MAIN AND OTHER CW PIPES SUITABLY. REMOVAL OF BLANKS, RESTORATION AND NORMALIZATION OF THE CONCERNED SYSTEM/LINE IS TO BE DONE AS PART OF WORK. NO SEPARATE PAYMENT WILL BE MADE FOR THESE ACTIVITIES.

4.1.2.27

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.

4.1.2.28

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.

4.2.0 PREPARATION OF FOUNDATIONS, PITS ETC.

4.2.1 BUILDINGS, FOUNDATIONS, TRENCHES FOR BURIED PIPING, AND OTHER NECESSARY CIVIL WORKS, PIPE RACK STRUCTURES, MAIN STRUCTURES ETC WILL BE PROVIDED BY BHEL. THE DIMENSIONAL ACCURACY, AXES, ELEVATION, LEVELS ETC, WITH REFERENCE TO BENCHMARKS OF FOUNDATIONS AND ANCHOR BOLT PITS HAVE TO BE CHECKED AND LOGGED BY THE CONTRACTOR BEFORE TAKING OVER THE FOUNDATIONS. THE CONTRACTOR, AS PART OF THE WORK, SHOULD DO ADJUSTMENTS OF FOUNDATION LEVEL, DRESSING AND CHIPPING OF FOUNDATION SURFACES OF ALL EQUIPMENTS AS PER BHEL ENGINEER'S INSTRUCTIONS. DRESSING AND CHIPPING OF FOUNDATIONS TO THE EXTENT OF 25MM FOR ACHIEVING PROPER LEVELS IS WITHIN THE SCOPE OF WORK.

4.2.2 ALL MINOR FOUNDATIONS AND ANCHOR POINTS REQUIRED FOR INSTALLING CONTRACTOR'S ERECTION EQUIPMENTS AND WINCHES ETC ARE IN THE SCOPE OF CONTRACTOR

4.2.3 WELDER'S PIT FOR IN-SITU WELDING OF BURIED PART OF CW PIPING SHALL BE MADE IN THE TRENCH FOR CW PIPING BY THE CONTRACTOR AS INCIDENTAL TO WORK.

4.3.0 WELDING, RADIOGRAPHY AND NDE

A) INSTALLATION OF PIPING OF ALL MATERIALS INVOLVES GOOD QUALITY WELDING; NDE CHECKS, ETC CONTRACTOR'S PERSONNEL ENGAGED SHOULD HAVE ADEQUATE KNOWLEDGE AND REQUISITE QUALIFICATION REQUIRED OF THE ABOVE WORKS.

B) THE METHOD OF WELDING WILL BE COMBINATION OF TIG AND ARC WELDING AND APPLICABLE DETAILS WILL BE INDICATED IN THE DRAWING / DOCUMENTS. BHEL ENGINEER WILL HAVE THE OPTION OF CHANGING THE METHOD OF WELDING AS PER SITE REQUIREMENT. WELDING OF WELD JOINTS, INCLUDING ROOT, WILL HAVE TO BE DONE WITH SPECIFIED WELDING ELECTRODES. IN CASE OF MAIN CW PIPING, THE ROOT WELDING HAS TO BE BACK GOUGED FROM INSIDE THE PIPE BY GRINDING AND WELDED. THAT IS FOR MAIN CW PIPING WELDING HAS TO BE DONE BOTH FROM INSIDE AS WELL AS FROM OUTSIDE THE PIPES AS PER THE RELEVANT ENGINEERING DOCUMENT.

C) CONTRACTOR SHALL ARRANGE ALL THE NECESSARY WELDING ELECTRODES. SELECTION AND USE OF WELDING ELECTRODES SHALL BE AS PER THE RELEVANT DRAWINGS/ ERECTION WELDING SCHEDULES OF BHEL/ SPECIFICATIONS OF EIL/CLIENT. CONTRACTOR SHALL ALWAYS BUY BHEL APPROVED BRAND OF ELECTRODES, LIST OF WHICH WILL BE FURNISHED AT SITE. CONTRACTOR SHALL NECESSARILY OBTAIN MANUFACTURING BATCH TEST CERTIFICATES FOR ALL BATCHES OF WELDING ELECTRODES AND SUBMIT COPY TO BHEL REGULARLY BEFORE THE ELECTRODES ARE PUT TO USE.

D) WELDING OF ALL SITE JOINTS OF PIPING FALLING UNDER THE PURVIEW OF IBR SHALL BE DONE ONLY BY THE WELDERS POSSESSING VALID AND CURRENT QULAFICATION CERTIFICATE OF THE IBR AUTHORITY OF STATE OF MADHYA PRADESH. CONTRACTOR SHALL ENSURE CURRENCY OF QUALIFICATION, INCLUDING ARRANGING THE RE-QUALIFICATION IF REQUIRED, TILL THE WORK IS COMPLETED.

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

G) PERFORMANCE OF ALL THE WELDERS SHALL BE CONTINUOUSLY MONITORED BASED ON VISUAL CHECK/LPI/MPI/RG/DESTRUCTIVE TEST OF SAMPLE JOINTS. TILL THE PERFORMANCE OF WELDER IS ESTABLISHED 100% RADIOGRAPHIC EXAMINATION OF JOINT WELDED BY HIM WILL HAVE TO BE DONE. PANEL OF QUALIFIED WELDERS SHALL BE CONTINUOUSLY UPDATED BASED ON THIS MONITORING. PERCENTAGE OF NDE/DE CHECKS SHALL BE RAISED IN CASE OF UNDER-PERFORMING WELDERS / DEFECTS DUE TO WELDING CONSUMABLES / DEFECTS GENERIC IN NATURE.

H) 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.

I) WELD JOINTS SHALL BE OFFERED FOR INSPECTION OF BHEL AND CLIENT AFTER FIT-UP AND PRIOR TO WELDING. ALL WELDED JOINTS SHALL BE SUBJECT TO ACCEPTANCE BY BHEL ENGINEER WHOSE DECISION SHALL BE FINAL AND BINDING. WELDING OF ALL ATTACHMENTS TO PIPING SHALL BE DONE ONLY BY THE QUALIFIED AND APPROVED WELDERS.

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

K) 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.

M) THE EXTERNAL WELDED SURFACE SHALL BE CLEANED OF SLAG, RUST ETC; GROUND FINISHED TO OBTAIN SMOOTH SURFACE FREE OF EXCESS UNDULATIONS, WRINKLES ETC WHEREVER REQUIRED, AND PAINTED OVER A BAND WIDTH SUITABLY COVERING THE ENTIRE HEAT AFFECTED ZONE FOR EACH SITE WELD JOINT.

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

P) NDE (RADIOGRAPHY & LPI/DPT) SHALL BE DONE AS PER APPROVED FIELD QUALITY PLAN/ OTHER BHEL/EIL/CLIENT DOCUMENTS.

Q) 100% RADIOGRAPHY MAY HAVE TO BE TAKEN IN RESPECT OF CERTAIN IN-SITU WELD JOINTS.

R) CONTRACTOR SHALL MAKE COMPLETE ARRANGEMENT FOR RADIOGRAPHY TEST OF WELDS CONNECTED WITH THIS WORK. IT MAY BE NOTED THAT INVARIABLY THE RADIOGRAPHY WORK WILL BE CARRIED OUT ONLY AFTER THE CLOSE OF OTHER SITE ACTIVITIES.

S) RADIOGRAPHY INSPECTION OF WELDS SHALL BE PERFORMED IN ACCORDANCE WITH REQUIREMENTS AND RECOMMENDATION OF BHEL ENGINEER. THE QUANTUM OF RADIOGRAPHIC INSPECTION SHALL BE AS

PER PROVISION OF BHEL'S ERECTION DOCUMENTS/ FQP. THEY MAY, HOWEVER BE INCREASED DEPENDING UPON THE PERFORMANCE OF THE INDIVIDUAL WELDER AT THE DISCRETION OF BHEL ENGINEER.

T) ALL RADIOGRAPHY FILMS AND RECORDS OF WELD JOINTS SHALL BE PRESERVED PROPERLY AND BE HANDED OVER TO BHEL. THESE SHALL BECOME THE PROPERTY OF BHEL.

U) FOR THE RADIOGRAPHY DONE AND JOINTS CLEARED AND ACCEPTED BY BHEL/ CLIENT, PAYMENT @ RS.10 PER CENTIMETER OF ACCEPTED FILM LENGTH (OF STANDARD WIDTH APPLICABLE FOR RESPECTIVE JOINTS). NO PAYMENT SHALL BE MADE FOR FILM LENGTHS NOT ACCEPTED BY BHEL AND REASONS FOR WHICH ARE ATTRIBUTABLE TO THE CONTRACTOR SUCH AS RETAKES ON ACCOUNT OF BAD SHOT, POOR JOINT QUALITY ETC. REFER SECTION-12 SPECIAL CONDITIONS OF CONTRACT, TERMS OF PAYMENT FOR RELEASE OF PAYMENT.

V) FOR PROTECTION OF ALL PIPE JOINTS AGAINST RUSTING IN CASE OF WET WEATHER CONDITIONS/ MOIST SURROUNDING / LONG GAP BETWEEN THE FIT UP AND ACTUAL TIME OF WELDING, SPECIAL WELDABLE PAINT AS APPROVED BY BHEL SHALL BE APPLIED AS PART OF WORK. SUCH PROTECTIVE PAINTS SHALL BE SUPPLIED BY CONTRACTOR.

W) FOR WELDING OF SS PIPES CONTRACTOR SHALL ARRANGE PURGING GAS OF SPECIFIED QUALITY AS MAY BE REQUIRED. SIMILARLY ALL CONSUMABLES REQUIRED FOR MAKING PURGE DAMS ETC AND ANY OTHER ARRANGEMENT REQUIRED SHALL BE CONTRACTOR'S SCOPE.

4.4 HEAT TREATMENT

4.4.1

PRE-HEATING, POST HEATING AND STRESS RELIEVING ARE PART OF THIS WORK AND SHALL BE PERFORMED BY THE CONTRACTOR IN ACCORDANCE WITH EIL SPECIFICATIONS AND/ OR INSTRUCTIONS OF BHEL ENGINEER. DURING PREHEAT AND STRESS RELIEVING OPERATIONS THE TEMPERATURE SHALL BE MEASURED BY THERMOCOUPLES AND RECORDED GRAPHS FOR THE HEAT TREATMENT WORKS CARRIED OUT SHALL BE THE PROPERTY OF BHEL.

4.4.2

THERMOCOUPLES HAVE TO BE ATTACHED TO THE JOB BY CAPACITOR DISCHARGE THERMOCOUPLE UNITS. LOCATIONS AND NUMBERS OF THERMOCOUPLES SHALL BE AS PER BHEL DOUMENTS/ INSTRUCTIONS.

4.4.3

CONTRACTOR SHOULD PROVIDE TEMPERATURE INDICATOR / TEMPERATURE RECORDER AS REQUIRED FOR MEASURING TEMPERATURE DURING PRE-HEATING, HEAT TREATMENT, HOT CORRECTION ETC.

4.5 ERECTION OF PIPING SYSTEM

4.5.1

THE WORK ON VARIOUS PIPING SYSTEMS WILL INCLUDE CUTTING PIPES AND TUBES TO REQUIRED LENGTH, EDGE PREPARATION, FABRICATION OF SEGMENTAL BENDS, REDUCERS AND TEES ETC OF PIPES BEYOND 24" DIA, LAYING, FIXING & WELDING OF THE PIPES / ELBOWS / FITTINGS/ VALVES ETC IN THE PIPELINE, FABRICATION OF AUXILIARY SUPPORT STRUCTURES AND HANGERS AND SUPPORTS, 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 AS PER BHEL ENGINEERS INSTRUCTIONS AND / OR AS PER APPROVED DRAWINGS / DOCUMENTS.

4.5.2

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 AND CONDUCT NDE AND POST WELD HEAT TREATMENT AS PER SPECIFICATIONS. IN CASE THE TERMINAL CONNECTIONS ARE FLANGED TYPE AND CALLS FOR WELDING OF FLANGES ON EITHER OR BOTH ENDS, SAME SHALL BE DONE AS PART OF SCOPE OF WORK.

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

1. INSTALLATION & REMOVAL OF ISOLATING DEVICES/ NRVS AND REMOVAL & RE-FIXING OF INTERNALS REQUIRED FOR HYDRAULIC TESTING, PRE-COMMISSIONING AND COMMISSIONING ACTIVITIES.
2. MATCHING OF FLANGES FOR ACHIEVING PARALLELISM AND ALIGNMENT.
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. SUBJECT TO THE CONDITION THAT SUCH CORRECTIONS ARE NOT ATTRIBUTABLE TO THE CONTRACTOR, CLAIMS IF ANY IN THIS REGARD SHALL BE GOVERNED BY THE CLAUSES HEREOF SECTION-13 SPECIAL CONDITIONS OF CONTRACT.
4. FABRICATION AND ERECTION & WELDING OF AUXILIARY STRUCTURES ETC REQUIRED FOR INSTALLATION OF HANGERS AND SUPPORTS ETC. STEEL FOR THIS PURPOSE WILL BE SUPPLIED BY BHEL IN RANDOM SIZES.

5. 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.
6. 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, GRINDING OFF ETC.
7. CLEANING/ AIR FLUSHING OF ALL PIPES PRIOR TO INSTALLATION.
8. WELDING OF ROOT VALVES WITH SMALL LENGTH OF PIPING TO THE PRESSURE, FLOW AND LEVEL TAPPING POINTS ON PIPING AND FLOW NOZZLES / ORIFICES / METERING ELEMENTS FIXED ON PIPING.
9. WELDING OF WELD BLANKS WITH DUE NDE & PWHT, IF REQUIRED, ON A TEMPORARY BASIS.
10. 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.

4.5.4

CONTRACTOR SHALL CO-ORDINATE WITH OTHER ERECTION AGENCIES OF BHEL/ CLIENT WHERE THE EQUIPMENTS FORMING TERMINAL POINTS FOR HIS WORK ARE IN THE SCOPE OF SUCH OTHER AGENCIES.

BHEL'S APPROVAL MUST BE OBTAINED PRIOR TO MAKING PIPING INTERFACE CONNECTIONS TO SUCH EQUIPMENTS. THIS MAY REQUIRE SEQUENTIAL WORKING FOR BEST RESULTS.

4.5.5

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.

4.5.6

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.

4.5.7

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.

4.5.8

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.

4.5.9

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

4.5.10

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.

4.5.11

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.

4.6.0 ERECTION OF MAIN COOLING WATER PIPING AND OTHER CW PIPING

4.6.1-A

THE PIPING WILL RUN PARTLY OVER THE GROUND AND IN EXCAVATED TRENCHES UNDERGROUND WHICH WILL BE COATED FOR PROTECTION FROM CORROSION AS PER RELEVANT SPECIFICATIONS. EXCAVATIONS OF TRENCHES, CONSTRUCTION OF DUCTS/ RCC PEDESTALS, BACKFILLING ETC ARE NOT IN THE SCOPE OF WORK.

CONNECTION OF BOTH THE SUPPLY AS WELL AS THE RETURN LINES WITH RESPECTIVE TERMINAL POINTS IS IN THE SCOPE OF WORK eg CONNECTION TO CONDENSER INLET AND OUTLET, CW PUMPS, COOLING TOWER RETURN ETC.

4.6.1-B

HYDRAULIC TEST OF PIPING ASSEMBLY SHALL BE CONDUCTED AFTER COMPLETION OF EVERY CERTAIN NUMBERS OF WELD JOINTS AS INSTRUCTED BY BHEL. SUPPLY OF SUITABLE BLANKS/ DISHED ENDS, WELDING/ BOLTING THE SAME, REMOVAL OF BLANKS AND FRESH EDGE PREPARATION OF PIPELINE AFTER SUCCESSFUL COMPLETION OF HYDRAULIC TEST IS TO BE CARRIED AS PART OF THE WORK. NO SEPARATE PAYMENT SHALL BE MADE FOR THIS WORK. THIS IS ALSO APPLICABLE IN RESPECT OF OTHER LP PIPING COVERED IN THE SCOPE.

4.6.1-C

MANHOLE DOOR OPENINGS MAY HAVE TO BE CUT ON THE MAIN PIPING AND NECESSARY ATTACHMENTS SUCH AS ACCESS PIPE, FLANGE, PAD PLATES ETC IS IN THE SCOPE OF WORK. THE ACCESS PIPE MAY HAVE TO BE SUITABLY CUT IN LENGTH AND IN PROFILE TO SUIT THE REQUIREMENT. BLIND/BLANK FLANGES HAVE TO BE BOLTED LATER ON TO CLOSE THE ACCESS OPENING. MATERIALS, FASTENERS ETC FOR THESE PERMANENT INSTALLATIONS WILL BE PROVIDED BY BHEL FREE OF CHARGE.

4.6.2 DE-WATERING OF PITS AND SHUTTERING TO AVOID LAND-SLIDE:
DE-WATERING OF PITS EXCAVATED BY THE CIVIL CONSTRUCTION AGENCY HAVE TO BE DONE PERIODICALLY TO ENSURE SAFE AND PROPER WORKING CONDITION. SIMILARLY, CONTRACTOR SHALL ARRANGE SHUTTERING WITH PROPS OF SIDE WALLS TO AVOID LAND SLIDE IN THE PIT WHEREVER REQUIRED FOR WORK.

4.7 ERECTION OF OTHER LP PIPELINES (CS, GI AND SS) AND ASSOCIATED EQUIPMENTS ETC

4.7.1

THE SCOPE OF WORK IN LP PIPING SYSTEMS/ SUB-SYSTEMS (AIR, WATER, OIL, FUEL AND ASSOCIATED EQUIPMENTS) SHALL INCLUDE CUTTING TO REQUIRED LENGTH, EDGE PREPARATION/THREADING, LAYING, FIXING OF THE PIPES, PIPE FITTINGS & ALL TYPES OF VALVES INCLUDING BUTTERFLY

VALVES, AIR AND STEAM TRAPS, ETC., BY WELDED / SCREWED / FLANGED JOINTS IN THE LINES, FABRICATION AND ERECTION OF AUXILIARY SUPPORTING STRUCTURES, FABRICATION AND FIXING SUPPORTS / HANGERS / SHOCK-ABSORBERS/ ANCHORS ETC, INSTALLATION OF ASSOCIATED EQUIPMENTS WHICH ARE INCIDENTAL TO THE PIPELINES AND CARRYING OUT ALL OTHER ACTIVITIES / WORK TO COMPLETE THE ERECTION AND ALSO CARRYING OUT ALL PRE-COMMISSIONING/ COMMISSIONING CHECKS, TRIALS, TESTING ETC MENTIONED IN THE VARIOUS PARTS OF THESE SPECIFICATIONS AS PER BHEL ENGINEER'S INSTRUCTIONS AND / OR AS PER APPROVED DRAWINGS.

4.7.2

CARRYING OUT OF PIPING WORKS BETWEEN EQUIPMENTS/POINTS CONSTITUTING TERMINAL POINTS AS PER THE SPECIFICATIONS. THE CONTRACTOR SHALL COMPLETE TERMINAL CONNECTIONS AT BOTH ENDS FOR ALL THE PIPING SYSTEMS WHETHER THE TERMINAL EQUIPMENT IS PART OF THIS WORK OR NOT. CONTRACTOR SHALL ENSURE THAT ALIGNMENT OF THE CONNECTED EQUIPMENTS AT ALL TERMINAL POINTS IS NOT DISTURBED ON ACCOUNT OF CONNECTING THE PIPELINES. ANY REWORK IN TERMINAL EQUIPMENTS AS WELL AS PIPELINES ARISING OUT OF IMPROPER TERMINAL CONNECTION/ WORKMANSHIP, TRANSFER OF LOAD/STRAIN ON TO THE TERMINAL EQUIPMENTS ATTRIBUTABLE TO CONTRACTOR SHALL BE ON THE CONTRACTOR'S ACCOUNT.

4.7.4

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.

4.7.5 G. I. PIPELINES

4.7.5.1

ALL G.I. PIPELINES SHALL BE JOINED BY THREADED (SCREWED) JOINTS. PIPES AND FITTINGS WILL BE SUPPLIED BY BHEL AS COMMERCIALY 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.

4.7.5.2

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

4.7.5.3

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.

4.8 TESTING, PRE-COMMISSIONING, AND ASSISTANCE FOR COMMISSIONING

4.8.1

TESTING, PRE-COMMISSIONING AND ASSISTANCE FOR COMMISSIONING WILL INVOLVE, THOUGH NOT LIMITED TO THESE, VARIOUS TESTING e.g. HYDRO-STATIC PRESSURE, PRESSURE DECAY TESTS, LEAK TEST, FLUSHING AND / OR BLOWING BY AIR, WATER, OIL, STEAM AS APPLICABLE; CHECKING/SETTING VARIOUS CLEARANCES/ PARAMETERS, ENSURING OPERATION OF VARIOUS EQUIPMENTS FREE OF UNDUE RESTRICTIONS, CHEMICAL CLEANING &, STEAM BLOWING OF THE PIPING ETC.

SOME OF THE MILESTONES LEADING TO COMMISSIONING OF THE SET ARE BOILER LIGH UP, CHEMICAL CLEANING OF BOILER, FLOATING OF SAFETY VALVES OF BOILER, STEAM ROLLING OF STG SET, SYCHRONIZATION AND PET COKE FIRING, TRIAL OPERATION AND LOADING ETC.

ALL THE PIPING AND OTHER ACTIVITIES REQUIRED FOR COMMISSIONING OF THE SET, AS INFORMED BY BHEL FROM TIME TO TIME SHALL BE COMPLETED.

4.8.2

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

4.8.3

CONTRACTOR SHALL LAY/INSTALL NECESSARY TEMPORARY PIPING, PUMPS, VALVES, BLANKS, GAUGES, CABLES, SWITCHES ETC FOR CONDUCT OF HYDRAULIC / PRESSURE TEST, CHEMICAL CLEANING, STEAM BLOWING, 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, FABRICATION AND INSTALLATION OF TEMPORARY TANKS FOR CHEMICAL MIXING, TEMPORARY ACCESS PLATFORMS TO MIXING TANKS ETC. 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.

FOR CHEMICAL CLEANING OF PIPING CONTRACTOR SHALL TAKE TAP-OFF FROM THE TEMPORARY CHEMICAL CIRCULATION SYSTEM INSTALLED BY THE BOILER ERECTION AGENCY AND OPERATE THE SYSYSTEM FOR HIS USE.

ELECTRICALLY OPERATED TRIP VALVE PROVIDED FOR THE PURPOSE OF STEAM BLOWING OF PIPING WILL HAVE TO BE SERVICE PRIOR TO PUTTING TO USE. SPARES REQUIRED, IF ANY FOR THE SAME WILL BE PROVIDED BY BHEL AS FREE ISSUE.

NO PAYMENT WILL BE MADE FOR TEMPORARY INSTALLATIONS MADE FOR HYDRAULIC TESTING OF VARIOUS SYSTEMS & PIPING. SIMILARLY NO PAYMENT WILL BE MADE FOR ELECTRICAL INSTALLATIONS MADE FOR ANY TEMPORARY SYSTEM.

4.8.4

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

IN ACCOUNTING OF MATERIALS FOLLOWING WASTAGE ALLOWANCES ARE PROVIDED:

1. STRUCTURAL ITEMS : 5%
2. PIPES : 3%

NO WASTAGE ALLOWANCE FOR VALVES & OTHER EQUIPTMENTS.

4.8.5

FABRICATION, FIT-UP, PRE-HEATING, WELDING, POST-WELD HEATING 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.

4.8.6

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. READJUSTMENT AND/OR REALIGNMENT, IF NECESSARY, SHALL BE DONE AS PER BHEL ENGINEER'S INSTRUCTIONS. CLAIM, IF ANY, FOR THESE WORKS SHALL BE GOVERNED BY SECTION-13, SPECIAL CONDITIONS OF CONTRACT PROVIDED THE CAUSE OF SUCH WORK IS NOT ATTRIBUTABLE TO THE CONTRACTOR.

4.8.7

- i) 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.
- ii) 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 13.7.

4.8.8

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 COMMISSIONED UNIT UNDERGOES TRIAL OPERATIONS.

4.8.9

COMMISSIONING ACTIVITIES WILL CONTINUE TILL THE COMPLETION OF TRIAL OPERATION. 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 ALONGWITH NECESSARY TOOLS AND PLANTS, CONSUMABLES ETC.

4.8.10

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

4.8.11

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.

4.8.12

AT VARIOUS STAGES OF COMPLETION BOILER HAS TO BE PRESERVED AGAINST CORROSION EITHER BY WET PRESERVATION OR BY DRY PRESERVATION AS PER THE REQUIREMENT OF BHEL ENGINEER. CONTRACTOR SHALL CARRY OUT ALL THE INCIDENTAL JOBS LIKE FILLING UP OF WATER, DOZING OF CHEMICALS AND PRESSURIZING THE SYSTEM TO THE REQUIRED PRESSURE, CHANGE OF GAS REFILLS ETC. THE BOILERS HAVE A PERMANENT N₂ BLANKETING ARRANGEMENT.

4.8.13

CONTRACTOR SHALL INSTALL ALL NECESSARY TAPPING POINTS, INSTRUMENTS ETC REQUIRED FOR PG TEST AND PROVIDE ASSISTANCE FOR CONDUCT OF PERFORMANCE GUARANTEE TEST. HOWEVER, IF FOR ANY REASON NOT ATTRIBUTABLE TO THE CONTRACTOR, THE PERFORMANCE GUARANTEE TEST IS NOT CARRIED OUT DURING THE CURRENCY OF CONTRACT AND CONTRACTOR IS NOT REQUIRED TO PROVIDE THE ASSISTANCE IN CONDUCT OF THE PG TEST THEN THE CONTRACT WILL BE CLOSED AFTER MUTUAL COMMERCIAL SETTLEMENT.

4.8.14

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.

4.9 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 ETC
- III) ALL ELECTRICAL AND CONTROL & INSTRUMENTATION ITEMS EXCEPT THOSE SPECIFIED ELSEWHERE IN THESE SPECIFICATIONS.
- IV) CIVIL WORKS EXCEPT TO THE EXTENT SPECIFICALLY INDICATED ELSEWHERE IN THIS TENDER.

- V) PNEUMATIC COPPER TUBING AND FITTINGS THEREOF.
- VI) FINAL PAINTING

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

5.1.1

CONTRACTOR SHALL MAKE HIS OWN ARRANGEMENTS FOR LABOUR COLONY AND STAFF QUARTERS INCLUDING LIGHTING, WATER, SANITATION ETC WITH HYGIENE AND COMPLY WITH ALL REQUIREMENTS. ONLY THE OPEN LAND WILL BE PROVIDED BY THE CLIENT FOR LABOUR COLONY. THATCHED CONSTRUCTION SHALL NOT BE PERMITTED, STEEL, BRICK & MORTAR CONSTRUCTION ONLY SHALL BE USED ACCOMMODATION QUARTERS. ALSO, THE CONTRACTOR HAS TO MAKE HIS OWN ARRANGEMENT FOR TRANSPORTATION OF HIS WORKMEN AND OTHER EMPLOYEES. BHEL/CLIENT SHALL NOT PROVIDE ANY FACILITY WITH REGARD TO ABOVE.

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. CONTRACTOR HAS TO PROVIDE SUITABLE CRANES FOR MATERIAL HANDLING AT BHEL/CLIENT'S STORES/STORAGE YARD. 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

CONTRACTOR'S RESPONSIBILITIES WITH REGARD TO OPERATOR, FUEL, LUBRICANTS AND DAILY UPKEEP OF T&P PROVIDED BY BHEL IS FURTHER DETAILED IN SECTION-7.

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

BHEL-PSWR-NAGPUR

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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. MMDS SHALL BE CALIBRATED ONLY AT ACCREDITED LABORATORY AS PER THE LIST AVAILABLE WITH BHEL OR ANY OTHER LABORATORY APPROVED BY BHEL.

5.2.10

BHEL T&P WILL BE ISSUED IN BASIC ASSEMBLED CONDITION; CONTRACTOR SHALL TRANSPORT THESE T&P TO & FRO BETWEEN BHEL STORES AND SITE. ADDITIONAL LOOSE COMPONENTS / SUB-ASSEMBLIES / ATTACHMENTS AS AND WHEN NECESSARY, WILL BE ISSUED BY BHEL. ASSEMBLY OF SUCH ADDITIONAL LOOSE COMPONENTS/SUB-ASSEMBLIES/ ATTACHMENTS IS IN CONTRACTOR'S SCOPE. TRANSPORTATION OF SUCH ADDITIONAL LOOSE COMPONENTS/ SUB-ASSEMBLIES/ ATTACHMENTS ETC FROM AND BACK TO BHEL STORES/YARD IS IN CONTRACTOR'S SCOPE.

5.2.11 TOOLS AND PLANTS AND TESTING FACILITY ETC REQUIRED FOR FABRICATION OF IBR PIPING :

CONTRACTOR SHALL DEPLOY IN COMPLIANCE OF IBR REQUIREMENTS ALL THE TOOLS AND PLANTS, ALL TESTING FACILITIES AND INCLUDING HYDRAULIC TESTING BLANKS AND PUMPS ETC AS REQUIRED TO COMPLETE THE FABRICATION OF ALL IBR PIPING TO ENTIRE SATISFACTION OF BOILER INSPECTOR CONCERNED.

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 PRIMERS AND PAINTS (OTHER THAN WHICH ARE SPECIFICALLY INCLUDED IN SCOPE OF BHEL) SHALL BE IN THE SCOPE OF CONTRACTOR.

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

ALL THE REQUIRED WELDING ELECTRODES AS APPROVED BY BHEL/ EIL SHALL BE ARRANGED BY CONTRACTOR AT HIS COST. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN PRIOR APPROVAL OF BHEL, BEFORE PROCUREMENT, REGARDING MANUFACTURER, TYPE OF ELECTRODES ETC. ON RECEIPT OF THE ELECTRODES AT SITE, IT SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY BHEL REGARDING TYPE OF ELECTRODES, BATCH NUMBER, DATE OF EXPIRY ETC. BATCH TEST CERTIFICATES SHALL BE MADE AVAILABLE FOR VERIFICATION & RECORD BEFORE THE ACTUAL USE OF THE WELDING CONSUMABLES.

BHEL RESERVES THE RIGHT TO REJECT THE USE OF ANY ELECTRODES, IF FOUND NON-ACCEPTABLE BECAUSE OF BAD QUALITY, DETERIORATION IN QUALITY DUE TO IMPROPER STORAGE, SHELF LIFE EXPIRY, UNAPPROVED TYPE / BRAND ETC.

5.4.2

ALL FILLER WIRES FOR TIG WELDING INCLUDING THOSE FOR SS MATERIALS ALL AS PER BHEL/ EIL SPECIFICATION SHALL BE ARRANGED BY THE CONTRACTOR.

5.4.3

GASES LIKE ARGON, OXYGEN, AND ACETYLENE ETC THAT ARE REQUIRED FOR ERECTION RELATED ACTIVITIES SHALL BE ARRANGED BY THE CONTRACTOR AT HIS COST. FURTHER, PURGING GASES AND OTHER CONSUMABLES REQUIRED FOR WELDING OF STAINLESS STEEL PIPING ARE ALSO TO BE ARRANGED BY THE CONTRACTOR.

5.5 FIELD OFFICE

5.5.1

THE CONTRACTOR SHALL MAKE HIS OWN ARRANGEMENTS FOR FIELD OFFICE AND STORES FOR ACCOMMODATING NECESSARY EQUIPMENTS, TOOLS ROOM FOR EXECUTION OF THE WORK. ONLY OPEN SPACE WILL BE PROVIDED BY BHEL / CUSTOMER, FREE OF CHARGES WITHIN THE PROJECT PREMISES AS PER THE AVAILABILITY OF SPACE.

5.5.2

ON COMPLETION OF WORK, ALL THE TEMPORARY BUILDINGS, STRUCTURES, PIPELINES, CABLES, ETC SHALL BE DISMANTLED AND LEVELED AND DEBRIS SHALL BE REMOVED AS PER INSTRUCTION OF BHEL BY THE CONTRACTOR AT HIS COST. IN THE EVENT OF HIS FAILURE TO DO SO, 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.

5.6 AREA LIGHTING

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, 3PHASE, 50Hz) WILL BE PROVIDED AT ONE POINT NEAR THE SITE APPROXIMATELY 500 METER FROM ERECTION SITE FREE OF CHARGE, HOWEVER ALL TAXES, DUTIES, LEVIES, CHARGES ETC SHALL ALSO BE BORNE BY THE CONTRACTOR. REQUIRED ENERGY METER, ALL CABLES, FUSES, DISTRIBUTION BOARDS, SWITCHES, SWITCHBOARDS, BUS BARS, EARTHING ARRANGEMENTS, PROTECTION DEVICES e.g. ELCB, IF ANY, AND ANY OTHER INSTALLATION AS SPECIFIED BY STATUTORY AUTHORITY, CLIENT IN THIS REGARD, FOR DRAWL OF CONSTRUCTION POWER 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.

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. INSTALLATION AND MAINTENANCE OF THIS SHALL BE DONE BY LICENSED AND EXPERIENCED ELECTRICIAN.

5.7.3

THE CUSTOMER WILL PROVIDE WATER FOR CONSTRUCTION PURPOSE AT A SINGLE POINT FREE OF CHARGE. HOWEVER, TAXES, DUTIES, LEVIES, CHARGES, IF ANY, SHALL BE BORNE BY THE CONTRACTOR. ALL ARRANGEMENTS FOR FURTHER DISTRIBUTION HAVE TO BE MADE BY THE CONTRACTOR.

5.7.4

CONTRACTOR SHALL BE WELL EQUIPPED WITH BACK-UP ARRANGEMENT TO TACKLE SITUATIONS ARISING DUE TO FAILURE OF CUSTOMER SUPPLIED POWER, SO AS TO ENSURE CONTINUITY AND COMPLETION OF CRITICAL PROCESSES AND ACTIVITIES 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/ PROJECT AUTHORITIES CALLING FOR POLICE VERIFICATION OF ANTECEDENTS OF THE WORKMEN, STAFF ETC.

5.8.2

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

5.8.3

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

5.9

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

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

5.10.1

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

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

5.10.2 Service Tax & Cess on Service Tax

Service Tax and Cess on Service Tax as applicable on output Services are excluded from contractor's scope; therefore contractor's price/rates shall be **exclusive** of Service Tax and Cess on Output Services. In case, it becomes mandatory for the contractor under provisions of relevant act/law to collect the Service Tax & Cess from BHEL and deposit the same with the concerned tax authorities, such applicable amount will be paid by BHEL. Contractor shall submit to BHEL documentary evidence of Service Tax registration and remittance record of such tax immediately after depositing the tax with concerned authorities. Contractor shall obtain prior written consent from BHEL before billing the amount towards such taxes.

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

5.10.3 VAT (Sales Tax /WCT)

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

5.10.4 Modalities of Tax Incidence on BHEL

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

5.10.5 New Taxes/Levies

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

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

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

5.11 SUBMISSION OF PERIODICAL REPORTS

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

- 1) CONSUMPTION OF CONSUMABLES LIKE WELDING ELECTRODES, GASES AND PAINTS
- 2) CONSUMPTION OF CONSTRUCTION POWER
- 3) AVAILABILITY AND UTILIZATION OF BHEL'S TOOLS & PLANTS
- 4) AVAILABILITY AND UTILIZATION OF CONTRACTOR'S TOOLS & PLANTS
- 5) DAILY MANPOWER REPORTS
- 6) DAILY PROGRESS REPORTS OF ACTIVITIES & INCIDENTS
- 7) CALIBRATION REPORTS
- 8) RECORDS OF WAGES PAYMENT
- 9) ANY OTHER REPORT/RECORD AS MAY BE SPECIFIED BY BHEL/CLIENT.

SECTION-6

SPECIAL CONDITIONS OF CONTRACT

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

6.1

THE CONTRACTOR SHALL DEPLOY ALL THE SKILLED/SEMISKILLED/ UNSKILLED LABOUR INCLUDING HIGHLY SKILLED WORKMEN ETC. THESE WORKMEN SHOULD HAVE PREVIOUS EXPERIENCE ON SIMILAR JOB. THEY SHALL HOLD VALID CERTIFICATES WHEREVER NECESSARY. BHEL RESERVES THE RIGHT TO INSIST ON REMOVAL OF ANY EMPLOYEE OF THE CONTRACTOR AT ANY TIME IF HE IS FOUND TO BE UNSUITABLE AND THE CONTRACTOR SHALL FORTHWITH REMOVE HIM. CONTRACTOR SHOULD FURNISH A TENTATIVE DEPLOYMENT PLAN OF HIS MANPOWER AS REQUIRED VIDE APPENDIX-VI. ALSO THE ACTUAL DEPLOYMENT WILL BE SO AS TO SATISFY THE ERECTION AND COMMISSIONING TARGETS SET BY BHEL.

6.2

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENGAGE HIS WORKMEN IN SHIFTS AND OR ON OVERTIME BASIS FOR ACHIEVING THE TARGETS SET BY BHEL. THIS TARGET MAY BE SET TO SUIT BHEL'S COMMITMENTS TO ITS CUSTOMER OR TO ADVANCE DATE OF COMPLETION OF EVENTS OR DUE TO OTHER REASONS. THE DECISION OF BHEL IN REGARD TO SETTING THE ERECTION AND COMMISSIONING TARGETS WILL BE FINAL AND BINDING ON THE CONTRACTOR.

6.3

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

6.4

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

6.5

THE SUPERVISORY STAFF EMPLOYED BY THE CONTRACTOR SHALL ENSURE PROPER OUTTURN OF WORK AND DISCIPLINE ON THE PART OF THE LABOUR PUT ON THE JOB BY THE CONTRACTOR. ALSO IN GENERAL THEY SHOULD SEE THAT THE WORKS ARE CARRIED OUT IN A SAFE AND PROPER MANNER AND IN COORDINATION WITH OTHER LABOUR AND STAFF EMPLOYED DIRECTLY BY BHEL OR OTHER CONTRACTORS OF BHEL OR BHEL'S CLIENT.

6.6

IF AT ANY TIME, IT IS FOUND THAT THE CONTRACTOR IS NOT IN A POSITION TO DEPLOY THE REQUIRED ENGINEERS/SUPERVISORS/WORKMEN DUE TO ANY REASON, BHEL SHALL HAVE THE OPTION TO MAKE ALTERNATE ARRANGEMENTS AT THE CONTRACTOR'S RISK AND COST.

6.7 SITE ORGANISATION

THE CONTRACTOR SHALL PROVIDE ADEQUATE STAFFING IN THE FOLLOWING AREAS IN ADDITION TO THE STAFFING REQUIREMENTS OF EXECUTION AS INSTRUCTED/INFORMED BY BHEL FROM TIME TO TIME:

- 6.7.1 OVERALL PLANNING, MONITORING & CONTROL
- 6.7.2 QUALITY CONTROL AND QUALITY ASSURANCE
- 6.7.3 MATERIALS MANAGEMENT
- 6.7.4 SAFETY, FIRE & SECURITY
- 6.7.5 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 AS BHEL SCOPE IN THESE SPECIFICATIONS.

7.1.4 MATERIALS FOR WELDER SITE QUALIFICATION TEST (PIPES)

BHEL WILL PROVIDE ONLY THE TUBES/PIPES FREE OF CHARGES FOR PREPARATION OF TEST PIECES FOR CONDUCTING THE SITE QUALIFICATION TEST OF ALL PIPE WELDER INCLUDING THOSE FOR HIGH PRESSURE/ IBR WELDERS. CONTRACTOR SHALL PREPARE THE REQUIRED TEST PIECES FROM SUCH RAW MATERIALS COMPLETE THE TESTING OF WELDERS. FOR SITE QUALIFICATION TEST OF ALL OTHER WELDERS SUCH STRUCTURAL ETC; CONTRACTOR SHALL ARRANGE ALL THE MATERIALS AND PREPARE TEST COUPONS. ALL COSTS TOWARDS QUALIFICATION OF CONTRACTOR'S WELDERS INCLUDING IBR WELDERS SHOULD BE BORN BY THE CONTRACTOR.

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

7.3 EQUIPMENTS – TOOLS & PLANTS

BHEL WILL MAKE AVAILABLE T&P LISTED IN THE RELEVANT APPENDIX FREE OF CHARGE. FURTHER DETAILS ARE AS UNDER:

7.3.1 CRANES TO BE PROVIDED BY BHEL

7.3.1.1
BHEL WILL MAKE AVAILABLE THE CRANE (AS PER RELEVANT APPENDIX) FREE OF CHARGES TO THE CONTRACTOR ON SHARING BASIS MAINLY FOR THE PURPOSES ENUMERATED VIDE NOTES IN THE ABOVE REFERRED APPENDIX. BHEL PROVIDED CRANES HAVE TO BE SHARED WITH OTHER AGENCIES / CONTRACTORS OF BHEL. THE ALLOCATION OF CRANES SHALL BE THE DISCRETION OF BHEL ENGINEER, WHICH SHALL BE BINDING ON THE CONTRACTOR.

7.3.1.2

CONTRACTOR SHALL PROVIDE SLEEPERS AND LAY NECESSARY SLEEPER BEDS, BACKFILLING OF APPROACHES WHEREVER NECESSARY FOR SAFE MOVEMENT OF THE CRANES AS DIRECTED BY BHEL. CONTRACTOR SHALL TRANSPORT THE EQUIPMENTS AND COMPONENTS/SUB ASSEMBLIES/ATTACHMENTS OF BHEL EQUIPMENTS TO & FRO BETWEEN BHEL STORES AND SITE.

7.3.1.3

CRANES, WILL BE INITIALLY ISSUED IN BASIC ASSEMBLED CONDITION. ANY ALTERATION/ADDITION LIKE BOOM REDUCTION/EXTENSION, ASSEMBLY OF COMPONENTS/SUB-ASSEMBLIES NEEDED FOR MODULATING THE CAPACITY/REACH/ OTHER FEATURES OF CRANES AND RESTORATION TO THE STATE AS DIRECTED BY BHEL SHALL BE THE CONTRACTOR'S RESPONSIBILITY.

7.3.1.4

ALL MAJOR CRANES BEING PROVIDED BY BHEL ARE HIRED FROM EXTENAL AGENCY. THE DAY-TO-DAY UPKEEP AND RUNNING MAINTENANCE LIKE FILLING / TOPPING UP OF LUBRICANTS, CHANGING FILTERS ETC, OF BHEL CRANES SHALL BE THE RESPONSIBILITY OF THE CRANE HIRING AGENCY. SPARES IF ANY, REQUIRED IN NORMAL COURSE WILL BE PROVIDED & MAJOR BREAKDOWNS WILL BE ATTENDED TO BY THE SAME AGENCY. THE CRANES PROVIDED BY BHEL WILL BE WITHDRAWN FOR REGULAR AND CAPITAL MAINTENANCE AS PER THE RESPECTIVE SCHEDULE OF MAINTENANCE. AS FAR AS POSSIBLE SUCH SCHEDULES WILL BE INTIMATED TO THE CONTRACTOR IN ADVANCE AND MAY BE ADJUSTED DEPENDING ON THE WORK REQUIREMENTS AT SITE. HOWEVER NO CLAIM WHATSOEVER WILL BE ENTERTAINED ON ACCOUNT OF NON-AVAILABILITY OF CRANE(S).

7.3.1.5

CONTRACTOR SHALL PROVIDE THE FUEL FOR HIS USE FOR THE CRANES PROVIDED BY BHEL.

7.3.1.6

WHERE THE SERVICES OF THE CRANES PROVIDED BY BHEL ARE TO BE SHARED BY OTHER AGENCIES/ CONTRACTORS OF BHEL, THE CONTRACTOR'S RESPONSIBILITIES DEFINED ABOVE WILL ALSO BE APPORTIONED ACCORDINGLY TO THE BENEFICIARY AGENCY. WORKING ARRANGEMENTS IN THIS REGARD WILL BE DONE AT SITE BY BHEL ENGINEER AND IN ANY CASE HIS DECISION SHALL BE FINAL AND BINDING.

7.4 OTHER T&P

7.4.1

THE RESPONSIBILITIES OF CONTRACTOR DEFINED ABOVE FOR BHEL CRANES SHALL ALSO BE APPLICABLE, MUTATIS – MUTANDIS, IN RESPECT OF OTHER TOOL & PLANTS PROVIDED BY BHEL.

7.4.2

CHEMICAL CLEANING EQUIPMENTS PROVIDED BY BHEL THAT HAVE TO BE USED IN TEMPORARY INSTALLATIONS FOR THE RESPECTIVE PURPOSE HAVE TO BE SERVICED BY THE CONTRACTOR PRIOR TO USE. BHEL WILL PROVIDE NECESSARY SPARES, PACKING ETC FREE OF CHARGE FOR THE SAME. THESE HAVE TO BE RETURNED TO BHEL AFTER DUE SERVICING AND PRESERVATION.

7.4.3

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

7.4.4

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

7.4.5

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.

7.4.6

REQUIRED TEMPORARY STRUCTURAL STEEL, PIPES & FITTINGS, VALVES FOR CONDUCT OF HYDRAULIC TEST, CHEMICAL CLEANING / STEAM BLOWING ETC SHALL BE PROVIDED BY BHEL AS FREE – RETURNABLE ISSUE BASIS.

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

ALL LUBRICANTS AND CHEMICALS REQUIRED FOR TESTING, PRESERVATION, CHEMICAL CLEANING OF THE UNIT WILL BE SUPPLIED BY BHEL FREE OF CHARGES.

SECTION-8

SPECIAL CONDITIONS OF CONTRACT

INSPECTION / QUALITY ASSURANCE / QUALITY CONTROL / STATUTORY INSPECTION

8.1

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

8.2

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

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

8.3

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

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

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

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

8.4

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

8.5

Vibration indicators/vibration recorders/vibration analysers will be provided by BHEL for checking and analysing vibration levels of rotating

equipments with necessary operators. Contractor shall provide necessary labour for carrying out such tests.

8.6

Total quality is the watch word 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.

8.7 STAGE INSPECTION BY FES / QA ENGINEERS

8.7.1

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

8.7.2

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

STATUTORY INSPECTION.

8.8.1

The scope includes getting the approvals from the statutory authorities (like boiler inspector and labour officers). This includes arranging for inspection visits of boiler inspector periodically as per BHEL Engineer's instructions, submitting documents, radiographs etc. and following up the matter with them.

8.8.2

All fees connected with the contractors for testing his welders / men / workers and testing, inspection, calibrating of his instruments and equipments, shall be paid by the contractor. It shall be contractor's responsibility to obtain approval of statutory authorities, wherever applicable, for the conducting of any work which comes under the purview of these authorities. Any cost arising from this shall be contractor's account. , Contractor shall pay all other fees (fees for visits, inspection fees, hydraulic test fees, light up inspection fees, registration fees etc.). In case these inspections have to be repeated due to default / fault of the contractor and fees have to be paid again, the contractor shall have to bear the charges. These would be deducted from his bills.

8.9

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 (instrument measuring and test equipment). The MMD shall have test / calibration certificates from authorised / government approved / accredited agencies traceable to national / international standards. Re-testing / re-calibration 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 calibration. Also if any MMD 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 MMD and retake the readings at contractor's cost.

Section-9

Special Conditions of Contract

Safety, Occupational Health and Environmental Management

BHEL PSWR has been certified for Environmental Management under ISO 14001:1996 standard and Occupational Health & Safety under OHSAS 18001 by DNV. In order to comply with the above standards, it shall be the 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

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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.

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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 administrators 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 absents himself from work for more than 46 hours, his accident report has to be sent to the respective Government Authorities. Therefore contractor shall inform the owner's representative such matter immediately for their needful action.

9.5.5

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

9.5.6

Before commencing the work, the contractor shall appoint/nominate a responsible officer to supervise implementation of all safety measures and liaison with his counterpart of BHEL.

9.6 AUDIT REVIEW AND INSPECTION

9.6.1

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

9.6.2

Inspections shall be carried out regularly by the contractors and by BHEL Engineers on activities, facilities, equipment, documentation, to cover the following aspects.

- Compliance with procedures and systems
- Availability, condition and use of 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
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1	Hand tools	To identify unsafe/defective tool	User	Daily
2	Power tools	To identify unsafe/defective tool	User	Daily
3	Fire Extinguishers	To check pressure and any defect	User / Safety Coordinator	Daily Every month
4	Lifting equipment/tackles	To check for defects and efficacy of brakes	User Third party	Daily Every Year
5	PPE	To check for defects	User	Daily

9.7 **NON COMPLIANCE:-**

9.7.1

NONCONFORMITY OF SAFETY RULES AND SAFETY APPLIANCES WILL BE VIEWED SERIOUSLY AND THE BHEL HAS RIGHT TO IMPOSE FINES ON THE CONTRACTOR AS UNDER **for every instance of violation noticed:**

Sl. No	Instance of Violation	Fine (in Rs)
01	Not Wearing Safety Helmet	50/-
02.	Not wearing Safety Belt	100/-
03.	Grinding Without Goggles	50/-
04.	Not using 24 V Supply For Internal Work	500/-
05.	Electrical Plugs Not used for hand Machine	100/-
06.	Not Slings property	200/-
07.	Using Damaged Sling	200/-
08.	Lifting Cylinders Without Cage	500/-
09.	Not Using Proper Welding Cable With Lot of Joints And Not Insulated Property.	200/-
10.	Not Removing Small Scrap From Platforms	200/-
11.	Gas Cutting Without Taking Proper Precaution or Not Using Sheet Below Gas Cutting	200/-
12.	Not Maintaining Electric Winches Which are Operated Dangerously	500/-
13.	Improper Earthing Of Electrical T&P	500/-
	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

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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

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IS No	YEAR	Amd upto	DESCRIPTION
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 SEWAGE SYSTEM
IS 1287	1986		ELECTRIC TOASTER
IS 13063	1991		STRUCTURAL SAFETY OF BUILDINGS ON SHALLOW FOUNDATIONS ON ROCKS
IS 13385	1992		SPECIFICATIONS FOR FIRE EXTINGUISHERS 50 LITRE WHEEL MOUNTED WATER TYPE (GAS CARTRIDGES)
IS 13386	1992		SPECIFICATIONS FOR FIRE EXTINGUISHERS 50 LITRE MECHANICAL FOAM TYPE
IS 13415	1992		CODE OF SAFETY FOR PROTECTIVE BARRIERS IN AND AROUND BUILDINGS
IS 13416	1992		RECOMMENDATIONS FOR PREVENTIVE MEASURES AGAINST HAZARDS AT WORKING PLACE PART 1 TO PART 5
IS 13430	1992		CODE OF PRACTICE FOR SAFETY DURING ADDITIONAL CONSTRUCTION AND ALTERATION TO EXISTING BUILDINGS
IS 13849	1993		PORTABLE FIRE EXTINGUISHERS DRY POWDER TYPE (CONSTANT PRESSURE)
IS 1446	1985		CLASSIFICATION OF DANGEROUS GOODS (FIRST REVISION)
IS 1476	1979		REFRIGERATORS
IS 1641	1988		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS (GENERAL): GENERAL PRINCIPLES OF FIRE GRADING AND CLASSIFICATION
IS 1642	1989		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS- DETAILS OF CONSTRUCTION
IS 1643	1988		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS (GENERAL): EXPOSURE HAZARD
IS 1646	1997		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS (GENERAL): ELECTRICAL INSTALLATIONS
IS 1904	1986		CODE OF PRACTICE FOR DESIGN AND CONSTRUCTION OF FOUNDATIONS IN SOIL
IS 1905	1987		STRUCTURAL SAFETY OF BUILDINGS MASONARY WALLS
IS 2082	1985		ELECTRICAL GEYSERS
IS 2171	1985		PORTABLE FIRE EXTINGUISHERS DRY POWDER TYPE (CARTRIDGE)
IS 2309	1989		PRACTICE FOR THE PROTECTION OF BUILDINGS AND ALLIED BUILDINGS AGAINST LIGHTENING
IS 2312	1967		EXHAUST FANS
IS 2361	1994		SPECIFICATION FOR BUILDING GRIPS - FIRST REVISION
IS 2418	1977		TUBULAR FLUORSCENT LAMPS IS 2418 (FT-1)
IS 2750	1964		STEEL SCAFFOLDINGS
IS 2762	1964		SAFE WORKING LOADS IN KGS FOR WIRE ROPE SLINGS
IS 2878	1986		FIRE EXTINGUISHERS CARBON DIOXIDE TYPE (PORTABLE AND TROLLEY MOUNTED)
IS 2925	1984		SPECIFICATION FOR INDUSTRIAL SAFETY HELMETS
IS 3016	1982		CODE OF PRACTICE FOR FIRE PRECAUTIONS IN WELDING AND CUTTING OPERATIONS- FIRST REVISION
IS 3315	1974		DESERT COOLERS
IS 3521	1989		INDUSTRIAL SAFETY BELTS AND HARNESS

IS No	YEAR	Amd upto	DESCRIPTION
IS 368	1983		IMMERSION WATER HEATERS
IS 3696	1991		SAFETY CODE OF SCAFFOLDS AND LADDERS PART 1 TO 2
IS 3737	1996		LEATHER SAFETY BOOTS FOR WORKERS IN HEAVY METAL INDUSTRIES
IS 374	1979		CEILING FANS INCLUDING REGULATORS
IS 3764	1992		EXCAVATION WORK - CODE OF SAFETY
IS 3786	1983		METHOD FOR COMPUTATION OF FREQUENCY AND SEVERITY RATES FOR INDUSTRIAL INJURIES AND CLASSIFICATION OF INDUSTRIAL ACCIDENTS
IS 3935	1966		CODE OF PRACTICE FOR COMPOSITE CONSTRUCTION
IS 4014	1967		CODE OF PRACTICE FOR STEEL TUBULAR SCAFFOLDING
IS 4081	1986		SAFETY CODE FOR BLASTING AND RELATED DRILLING OPERATIONS
IS 4082	1977	1996	STACKING AND STORAGE OF CONSTRUCTION MATERIALS AND COMPONENTS AT SITE
IS 4130	1991		DEMOLITION OF BUILDINGS - CODE OF SAFETY PART 1 TO 2
IS 4138	1977		SAFETY CODE FOR WORKING IN COMPRESSED AIR (FIRST REVISION)
IS 4155	1966		GLOSSARY OF TERMS RELATING TO CHEMICAL AND RADIATION HAZARDS AND HAZARDOUS CHEMICALS
IS 4209	1967		CODE OF SAFETY FOR CHEMICAL LABORATORY
IS 4250	1980		FOOD MIXERS
IS 4262	1967		CODE OF SAFETY FOR SULFURIC ACID
IS 4756	1978		SAFETY CODE FOR TUNNELING WORK
IS 4912	1978		SAFETY REQUIREMENTS FOR FLOOR AND WALL OPENINGS, RAILINGS AND TOE BOARDS
IS 5121	1969		SAFETY CODE FOR PILING AND OTHER DEEP FOUNDATIONS
IS 5182	1969	1982	METHODS FOR MEASUREMENT OF AIR POLLUTION
IS 5184	1969		CODE OF SAFETY FOR HYDROFLUORIC ACID
IS 5216	1982	2000	RECOMMENDATIONS ON SAFETY PROCEDURES AND PRACTICE IN ELECTRICAL WORK PART I AND II
IS 555	1979		TABLE FANS
IS 5557	1995		INDUSTRIAL AND SAFETY LINED RUBBER BOOTS (SECOND REVISION)
IS 5916	1970		SAFETY CODE FOR CONSTRUCTION INVOLVING USE OF HOT 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 No	YEAR	Amd upto	DESCRIPTION
IS 7812	1975		CODE OF SAFETY FOR MERCURY
IS 7969	1975		SAFETY CODE FOR HANDLING AND STORAGE OF BUILDING MATERIALS
IS 8089	1976		CODE OF SAFE PRACTICE FOR LAYOUT OF OUTSIDE FACILITIES IN AN INDUSTRIAL PLANT
IS 8091	1976		CODE OF PRACTICE FOR INDUSTRIAL PLANT LAYOUT
IS 8095	1976		ACCIDENTS PREVENTION TAGS
IS 818	1968	1997	CODE OF PRACTICE FOR SAFETY AND HEALTH REQUIREMENTS IN ELECTRIC AND GAS WELDING, AND CUTTING OPERATIONS
IS 8448	1989		AUTOMATIC LINE VOLTAGE CORRECTOR (STABILISER)
IS 8519	1977		GUIDE FOR SELECTION OF INDUSTRIAL SAFETY EQUIPMENT FOR BODY PROTECTION
IS 8520	1977		GUIDE FOR SELECTION OF INDUSTRIAL SAFETY EQUIPMENT FOR EYE, FACE AND EAR PROTECTION
IS 875	1987		STRUCTURAL SAFETY OF BUILDING: LOADING STANDARD PART 1 TO 5
IS 8807	1978		GUIDE FOR SELECTION OF INDUSTRIAL SAFETY EQUIPMENT FOR PROTECTION OF ARMS AND HANDS
IS 8978	1985		INSTANTANEOUS WATER HEATERS
IS 8989	1978		SAFETY CODE FOR ERECTION OF CONCRETE FRAMED STRUCTURES
IS 940	1989		PORTABLE FIRE EXTINGUISHERS WATER TYPE (GAS CARTRIDGE)
IS 9457	1980		SAFETY COLOURS AND SIGNS
IS 9679	1980		CODE OF SAFETY FOR WORK ENVIRONMENTAL MONITORING
IS 9706	1997		CODE OF PRACTICE FOR THE CONSTRUCTION OF AERIAL RPEWAYS FOR THE TRANSPORTATION OF MATERIAL
IS 9759	1981		GUIDELINES FOR DEWATERING DURING CONSTRUCTION
IS 9815	1989		SERVO MOTOR OPERATED LINE VOLTAGE CORRECTOR (SERVO STABILISER)
IS 9944	1992		RECOMMENDATIONS ON SAFE WORKING LOAD FOR NATURAL AND MAN-MADE FIBRE ROPE SLINGS
IS 996	1979		SINGLE PHASE ELECTRIC MOTORS
ISO 3873	1977		SAFETY HELMET

SECTION-10

Special Conditions of Contract

10.0 Drawings And Documents

10.1

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

10.2

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

10.3

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

10.4

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

10.5

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

10.6

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

10.7

In case of discrepancy between quoted item rate and corresponding amount in the rate schedule, the **quoted item rates shall be reckoned as correct and amount recalculated**. Quoted item rates shall also prevail for arriving at the total price quoted for offer evaluation.

10.8

Bank Guarantees to be furnished by the Contractor towards Security Deposit and Performance Guarantee (Last 5% payment against Workmanship Warranty/Defect Liability) shall have a claim period of six months over and above the validity period required for the case.

SECTION-11
SPECIAL CONDITIONS OF CONTRACT
TIME SCHEDULE, MOBILIZATION, PROGRESS MONITORING, OVER RUN, VARIATION ETC.

11.1 TIME SCHEDULE & MOBILIZATION

11.1.1 INITIAL MOBILIZATION AND TENTATIVE SCHEDULE

CONTRACTOR SHALL WITHIN **TWO WEEKS** FROM THE DATE OF FAX LETTER OF INTENT, MOBILIZE HIS INITIAL RESOURCES SO AS TO START THE WORK AS PER DIRECTIONS OF CONSTRUCTION MANAGER BHEL.

THE CONTRACTOR HAS TO SUBSEQUENTLY AUGMENT HIS RESOURCES IN SUCH A MANNER THAT THE ENTIRE WORK IS COMPLETED TO ACHIEVE THE FOLLOWING TENTATIVE SCHEDULE:

SN	MAJOR MILESTONE	TENTATIVE COMPLETION SCHEDULE FOR UNIT#1
01	COMMISSIONING AND TRIAL OPERATION OF UNIT#1 (INTERVENING MILESTONES WILL BE INTIMATED AT SITE WHICH SHALL BE FINAL & BINDING ON THE CONTRACTOR)	WITHIN 8 MONTHS FROM START OF ERECTION

THE COMPLETION SCHEDULE OF UNIT # 2 AND UNIT#3 WILL HAVE A PHASE SHIFT OF 2 MONTHS AND 4 MONTHS RESPECTIVELY WITH REFERENCE TO UNIT#1. FURTHER, SYSTEMS/ PIPING COMMON AMONG UNITS SHALL BE COMPLETED WITHIN THE SCHEDULE OF COMPLETION OF UNIT#1.

IN ORDER TO MEET ABOVE SCHEDULE IN GENERAL, AND ALL OTHER INTERMEDIATE TARGETS SET, TO MEET CUSTOMER/ PROJECT SCHEDULE REQUIREMENTS, CONTRACTOR SHALL ARRANGE & AUGMENT ALL NECESSARY RESOURCES FROM TIME TO TIME ON THE INSTRUCTIONS OF BHEL WITHOUT ANY COST TO BHEL.

11.1.2 **CONTRACT PERIOD**

THE TOTAL CONTRACT PERIOD FOR COMPLETION OF ENTIRE WORK UNDER SCOPE SHALL BE 12 **(TWELVE) MONTHS** FROM THE START OF CONTRACT PERIOD.

PERMANENT ERECTION OF THE FIRST COLUMN SEGMENT OR MAJOR SUB-ASSEMBLY/MAIN ASSEMBLY OF ANY OTHER EQUIPMENT ON ITS DESIGNATED FOUNDATION FOLLOWING DUE PROCESS OF PRE-ASSEMBLY AND QUALITY CHECKS AS PER APPROVED FIELD QUALITY PLAN (FQP) SHALL BE RECKONED AS THE START OF CONTRACT PERIOD FOR THIS CONTRACT. PLACEMENT OF PACKER PLATES, SHIM, ANCHORS, EMBEDMENTS ETC SHALL NOT BE CONSIDERED FOR THIS PURPOSE.

11.1.3 GRACE PERIOD

GRACE PERIOD OF 2 (TWO) MONTHS BEYOND THE CONTRACT PERIOD MAY BE PROVIDED FOR THIS CONTRACT AT THE DISCRETION OF BHEL.

11.1.4 CONSEQUENCE OF DELAY

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

11.2 PROGRESS MONITORING, CONTRACT EXTENSION AND OVERRUN

11.2.1 PROGRESS MONITORING

PROGRESS WILL BE REVIEWED PERIODICALLY (DAILY/WEEKLY/MONTHLY) INCLUDING MONTH END REVIEW VIS-A-VIS THE PLANS DRAWN AS ABOVE. THE CONTRACTOR SHALL SUBMIT PERIODICAL PROGRESS REPORTS AND OTHER REPORTS/INFORMATION INCLUDING MANPOWER, CONSUMABLES ETC AS DESIRED BY BHEL.

11.2.2 ASCERTAINING AND ESTABLISHING THE REASONS FOR SHORTFALL

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

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

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

11.2.3 CONTRACT EXTENSION

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

11.2.4

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

11.2.5

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

11.2.6 OVERRUN COMPENSATION

IF THE CONTRACT IS EXTENDED BEYOND THE CONTRACT AND GRACE PERIOD FOR ANY REASON OTHER THAN THOSE ATTRIBUTABLE TO THE CONTRACTOR OR FORCE MAJEURE CONDITIONS, THE CONTRACTOR WILL BE COMPENSATED BY PAYMENT OF OVERRUN CHARGES AT THE RATE OF Rs. 75,000/- (RUPEES SEVENTY FIVE THOUSAND ONLY) PER MONTH. OVERRUN COMPENSATION WILL BE PAID FOR THE EXTENSION ATTRIBUTABLE TO BHEL ONLY. NO OVERRUN COMPENSATION WILL BE PAYABLE FOR THE EXTENSION ON ACCOUNT OF REASONS ATTRIBUTABLE TO CONTRACTOR AND/OR FORCE

MAJEURE CONDITIONS. OVERRUN COMPENSATION FOR ELIGIBLE PERIOD SHALL BE IN PROPORTION TO THE PROGRESS ACHIEVED AGAINST THE PLAN FOR RESPECTIVE PERIOD.

11.3 PRICE VARIATION

THE PRICES SHALL REMAIN FIRM THROUGH OUT THE CONTRACT PERIOD AND ALSO EXTENSION THEREOF, IF ANY. ACCORDINGLY THE PRICE VARIATION CLAUSE OF GENERAL CONDITIONS OF CONTRACT IS, THEREFORE, NOT APPLICABLE.

11.4 CONTRACT VARIATIONS

11.4.1 VARIATION IN WEIGHT

WEIGHTS OF VARIOUS EQUIPMENTS, QUANTITIES OF VARIOUS ITEMS OF WORK 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. PAYMENT WILL BE MADE FOR THE ACTUALLY EXECUTED QUANTITIES OF VARIOUS ITEMS OF WORK.

11.4.2 VARIATION IN HP BUTT WELD JOINT QUANTITIES

NO ADDITIONAL PAYMENT OR RECOVERY IS ENVISAGED FOR THIS WORK.

11.5 INTEREST BEARING RECOVERABLE ADVANCE

Interest bearing (rate of interest will be 1% per annum more than bank interest rate, on monthly reducing balance basis) recoverable advance limited to 5% of the contract value may be paid by BHEL at its discretion depending on the merit of the case against receipt & acceptance of bank guarantee from the contractor for the amount sought. This bank guarantee (BG) shall be valid at least for one year or the recovery duration. In case recovery of dues does not get completed within the aforesaid BG validity period, the contractor must renew the validity of BG or submit fresh BG for the outstanding amount and remaining recovery period. BHEL is entitled to make recovery of the entire outstanding amount in case the contractor fails to comply with the BG requirement as above.

Recovery of dues will be made minimum @ 10% of the admitted gross running bill amount from the first applicable running bill onwards till entire due (principal plus interest) is recovered. In the event sufficient time duration is not left for recovery @10%, the rate of recovery shall be suitably enhanced so that entire due is recovered within the contract period (including extensions granted or foreclosure if any).

11.6 DEFINITION OF WORK COMPLETION

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

SECTION-12

SPECIAL CONDITIONS OF CONTRACT

12.0 TERMS OF PAYMENT

12.0.1

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

12.0.2

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

12.0.3

Release of payment in each running bill will be restricted to 95% of the value of work admitted, as per the percentage break-up for the stage of work completion stipulated vide clauses hereinafter.

The 5% thus remaining shall be on account of workmanship guarantee of work executed. The same will be released after completion of the guarantee period of **12 months** from the date of completion of entire work as certified by BHEL.

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

12.0.4

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

12.0.5

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

1. Name of the Company
2. Name of Bank
3. Name of Bank Branch
4. City/Place
5. Account Number

BHEL-PSWR-NAGPUR

Tender Specification No. BHE/PW/PUR/BORLI-PPE/563

6. Account type
7. IFSC code of the Bank Branch
8. MICR Code of the Bank Branch

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

12.1 PRICE BREAK UP & STAGES OF PROGRESSIVE PRO-RATA PAYMENTS

12.1.1 PRICE BREAK UP FOR FABRICATION AND ERECTION, TESTING & COMMISSIONING

FOR ALL CONTRACTUAL PURPOSES THE ITEM RATES WILL BE DIVIDED IN TO TWO PARTS ONE AS PRICE FOR FABRICATION AND OTHER AS PRICE FOR ERECTION, TESTING & COMMISSIONING IN FOLLOWING MANNER:

SL. NO. IN THE RATE SCHEDULE – PRICE BID	DESCRIPTION	PRICE FOR FABRICATION (PART-A)	PRICE FOR ERECTION, TESTING & COMMISSIONING (PART-B)
1.	IBR PIPING AND FITTINGS	50%	50%
2.	NON-IBR PIPING AND FITTINGS	35%	65%
3.	MAIN CW PIPING AND OTHER CW PIPING WITH FITTINGS	45%	55%

12.1.2 STAGES OF PRO-RATA PROGRESSIVE PAYMENT

EACH PART OF THE ABOVE PRICE BREAK WILL BE CONSIDERED AS 100% AND WILL BE RELEASED PROGRESSIVELY ON PRO-RATA BASIS IN EACH CASE IN THE FOLLOWING MANNER:

12.1.2.1 PAYMENT TOWARDS SITE FABRICATION OF PIPES

(i) FOR IBR PIPING & FITTINGS (ITEM RATE Sl.No. 1):

(a) 60% OF PART-A WILL BE PAID ON COMPLETION OF FABRICATION AS PER BHEL DRAWINGS MEETING ALL IBR REQUIREMENTS

(b) 10% OF PART-A WILL BE PAID ON COMPLETION OF NDE AS PER IBR REQUIREMENTS

(c) 20% OF PART-A WILL BE PAID ON COMPLETION OF TESTING SUCH AS HYDRAULIC TESTING AS PER IBR REQUIREMENT AND AFTER REMOVAL OF BLANKS ETC, IF ANY AND AFTER FINISHING THE COMPONENT TO STATUS OF RELEASED FOR ERECTION.

(d) 10% OF PART-A WILL BE PAID ON COMPLETION OF ALL DOCUMENTATION AS PER IBR AND ON OBTAINING THE APPROVAL OF IBR AUTHORITY.

(ii) FOR NON-IBR PIPING AND FITTINGS (ITEM RATE Sl.No. 2):

(a) 70% OF PART-A WILL BE PAID ON COMPLETION OF FABRICATION AS PER BHEL DRAWINGS MEETING ALL BHEL/ EIL REQUIREMENTS

(b) 10% OF PART-A WILL BE PAID ON COMPLETION OF NDE AS PER BHEL/ EIL REQUIREMENTS

(c) 10% OF PART-A WILL BE PAID ON COMPLETION OF TESTING SUCH AS HYDRAULIC TESTING AS PER REQUIREMENT AND AFTER REMOVAL OF BLANKS ETC, IF ANY AND AFTER FINISHING THE COMPONENT TO STATUS OF RELEASED FOR ERECTION.

(d) 10% OF PART-A WILL BE PAID ON COMPLETION OF ALL DOCUMENTATION AS PER BHEL/ EIL REQUIREMENT

(iii) FOR MAIN CW AND OTHER CW PIPING (ITEM RATE Sl.No. 3):

(a) 70% OF PART-A WILL BE PAID ON COMPLETION OF FABRICATION AS PER BHEL DRAWINGS MEETING ALL BHEL/ EIL REQUIREMENTS

(b) 10% OF PART-A WILL BE PAID ON COMPLETION OF NDE AS PER BHEL/ EIL REQUIREMENTS

(c) 10% OF PART-A WILL BE PAID ON COMPLETION OF TESTING SUCH AS HYDRAULIC TESTING AS PER REQUIREMENT AND AFTER REMOVAL OF BLANKS ETC, IF ANY AND AFTER FINISHING THE COMPONENT TO STATUS OF RELEASED FOR ERECTION.

(d) 10% OF PART-A WILL BE PAID ON COMPLETION OF ALL DOCUMENTATION AS PER BHEL/ EIL REQUIREMENT

NOTE: FABRICATION COMPONENT i.e. PART-A WILL NOT BE PAID FOR PIPES AND FITTING OF FIELD ROUTED PIPE LINES INVOLVING SIZES UPTO AND INCLUDING 2" SIZE . IN SUCH CASES ONLY THE PART-B COMPONENT SHALL BE PAID.

12.1.2.2 PAYMENT TOWARDS ERECTION, TESTING AND COMMISSIONING

THE PART-B OF THE RESPECTIVE ITEM RATE IN EACH OF THE ABOVE CASES SHALL BE RELEASED PROGRESSIVELY ON PRO-RATA BASIS IN THE FOLLOWING RATIO

(i) IBR AND NON-IBR PIPING & FITTINGS (RATE SCHEDULE ITEM Nos. 1 & 2)

SL. NO.	DESCRIPTION	
1	PRE-ASSEMBLY DONE AT SITE	
1.1	PRE-ASSEMBLY OF PIPES, FIT UP AND WELDING/ BOLTING ETC OF PRE-ASSEMBLY JOINTS AS APPLICABLE,	40%
1.2	ERECTION/PLACEMENT IN POSITION OF PRE-ASSEMBLED PIPES ETC	15%
1.3	IN-SITU ALIGNMENT, JOINT FIT-UP, WELDING/BOLTING AS APPLICABLE	20%
OR		
1	DIRECTLY ERECTED PIPES i.e. WITHOUT PRE-ASSEMBLY	
1.1	PLACEMENT IN POSITION	35%
1.2	ALIGNMENT, JOINT FIT UP AND WELDING/BOLTING	40%
1.3	NOT APPLICABLE	-
AND (APPLICABLE TO BOTH PRE-ASSEMBLIES AND DIRECT PLACEMENTS)		
1.4	NON-DESTRUCTIVE EXAMINATION OF COMPLETED AND ACCEPTED WELD JOINTS.	05%
1.5	FLOATING OF LINES ON PERMANENT HANGERS AND SUPPORTS	05%
1.6	SUCCESSFUL COMPLETION OF HYDRO TEST/ LEAK TEST AS APPLICABLE.	05%
1.7	FLUSHING, CLEANING, STEAM BLOWING OF LINES	03%

	AS APPLICABLE.	
1.8	SUBMISSION OF MARKED-UP AND AS-BUILT DRAWINGS OF RESPECTIVE UNITS.	02%
1.9	BOILER LIGHT UP AND ABO COMPLETION OF RESPECTIVE UNIT	3%
1.10	SYNCHRONIZATION OF RESPECTIVE UNIT.	1%
1.11	TRIAL OPERATION OF RESPECTIVE UNITS.	1%

(ii) PIPES & FITTINGS OF MAIN COOLING WATER & OTHER COOLING WATER PIPING (RATE SCHEDULE ITEM NO. 3)

(P) FOR PIPES WITHOUT PRE ASSEMBLY

(I) 25% OF CONTRACT RATE ON PRO RATA BASIS ON PLACEMENT/ERECTION

(II) 30% OF CONTRACT RATE ON PRO RATA BASIS ON FIT UP, ALIGNMENT AND WELDING

(III) 20% OF CONTRACT RATE ON PRO RATA BASIS ON COMPLETION OF RADIOGRAPHY/NDE

(IV) 15% OF CONTRACT RATE ON PRO RATA BASIS ON COMPLETION OF HYDRO TEST.

(V) 10% OF CONTRACT RATE ON COMPLETION OF TRIAL OPERATION OF RESPECTIVE UNITS.

(Q) FOR PIPES WITH PRE ASSEMBLY

(I) 35% OF CONTRACT RATE ON PRO RATA BASIS ON COMPLETION OF PRE-ASSEMBLY, JOINT FIT-UP AND WELDING.

(II) 10% OF CONTRACT RATE ON PRO RATA BASIS ON COMPLETION OF RADIOGRAPHY / NDE OF PRE-ASSY. JOINTS.

(III) 35% OF CONTRACT RATE ON PRO RATA BASIS ON COMPLETION OF ERECTION IN POSITION, JOINT FIT-UP, IN-SITU WELDING.

(IV) 10% OF CONTRACT RATE ON PRO RATA BASIS ON COMPLETION OF RADIOGRAPHY TEST / NDE OF IN-SITU WELD JOINTS.

(V) 10% OF CONTRACT RATE ON COMPLETION OF TRIAL OPERATION OF RESPECTIVE UNITS.

12.1.3 AUXILIARY STRUCTURES, HANGERS & SUPPORTS (RATE SCHEDULE ITEM NO. 4)

1.1	FABRICATION, PRE-ASSEMBLY AND ERECTION	45%
1.2	ALIGNMENT, WELDING, BOLTING AND GROUTING AS APPLCBL	45%
1.3	NDE OF STRUCTURAL WELD JOINTS	5%
1.4	BOILER LIGHT UP AND ABO COMPLETION OF RESPECTIVE	3%
1.5	SYNCHRONIZATION OF RESPECTIVE UNIT	1%
1.6	TRIAL OPERATION OF RESPECTIVE UNIT	1%

12.1.4 WRAPPING AND COATING OF BURRIED PIPING (RATE SCHEDULE ITEM NO. 5)

100% OF ITEM RATE ON PRO-RATA BASIS FOR THE MEASURED WORK IN EACH MONTH

12.1.5 CONDUCTING POSITIVE MATERIAL INDICATION TEST (RATE SCHEDULE ITEM NO. 6)

100% OF ITEM RATE ON PRO-RATA BASIS FOR THE MEASURED WORK IN EACH MONTH

12.1.6 ERECTION, TESTING AND COMMISSIONING OF VALVES (RATE SCHEDULE ITEM NO. 7)

SL. NO.	DESCRIPTION	
1	PLACEMENT IN POSITION	35%
2	ALIGNMENT, JOINT FIT UP AND WELDING/BOLTING	40%
3	NON-DESTRUCTIVE EXAMINATION OF COMPLETED AND ACCEPTED WELD JOINTS.	05%
4	FLOATING OF LINES ON PERMANENT HANGERS AND SUPPORTS	05%
5	SUCCESSFUL COMPLETION OF HYDRO TEST/ LEAK TEST AS APPLICABLE.	05%

6	FLUSHING, CLEANING, STEAM BLOWING OF LINES AS APPLICABLE.	03%
7	SUBMISSION OF MARKED-UP AND AS-BUILT DRAWINGS OF RESPECTIVE UNITS.	02%
8	BOILER LIGHT UP AND ABO COMPLETION OF RESPECTIVE UNIT	3%
9	SYNCHRONIZATION OF RESPECTIVE UNIT.	1%
10	TRIAL OPERATION OF RESPECTIVE UNITS.	1%

12.1.7

RADIOGRAPHY OF SITE WELD {REFER CLAUSE 4.3.0 (U)}

100% OF CONTRACT RATE OR PRO RATA BASIS ON ACCEPTANCE OF FILMS AS GOOD BY BHEL.

FOR RADIOGRAPHY TEST (RT) THE PAYMENT SHALL BE 100% OF THE CONTRACT RATE ON PRORATA BASIS ON ACCEPTANCE OF THE SAME. IN THE CASE OF SUBSTUTION OF 'RT' WITH ULTRASONIC TEST, THE RATES WILL BE LIMITED TO THAT OF RADIGRAPHY.

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

FOR PAYMENT OF TEMPORARY SYSTEM FOR CHEMICAL CLEANING AND STEAM BLOWING OF PIPING THE MEASUREMENT FOR THE PIPING, FITTING, VALVES ETC AND EQUIPMENTS LIKE 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 OF 75% OF ACCEPTED ITEM RATE FOR NON-IBR PIPING VIDE SL. NO. 2 OF RATE SCHEDULE. NO PAYMENT WILL BE MADE FOR THE EQUIPMENTS BROUGHT BY THE CONTRACTOR AND FOUNDATIONS MADE BY THE CONTRACTOR FOR TEMPORARY SYSTEMS.

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 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 /BY THE CONTRACTOR, SHALL NOT BE CONSIDERED FOR 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) NO SEPARATE PAYMENT SHALL BE MADE FOR GROUTING OF EQUIPMENTS, STRUCTURES ETC SPECIFIED ELSEWHERE IN THESE SPECIFICATIONS.
- G) NO SEPARATE PAYMENT WILL BE MADE FOR THE WEIGHT/VOLUME OF LUBRICANT, OILS, CHEMICALS, GASES, WATER, PRESERVATIVES ETC.

SECTION-13

SPECIAL CONDITIONS OF CONTRACT

EXTRA CHARGES FOR MODIFICATION AND RECTIFICATION

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

13.4

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

BHEL may, at their absolute discretion, consider for payment, as extra on man-day basis as found by them as justifiable for such of those works specified in clause no. 13.1 which require major modification / repair / rework / rectification etc. It may also be noted that only those works which are identified as major and warrant extra payment and certified as such by BHEL site engineer, accepted by the designers, and / or competent authority of BHEL will be considered for extra payment.

13.8

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

MAN HOUR RATE FOR ELIGIBLE EXTRA WORKS

Average man-hour rate including overtime if any, and other site expenses and incidentals, including supervision, consumables, tools and tackles, will be Rs. 40/- (Rupees forty only) per man-hour.

No payment will be made, if an item of work lasts less than 100 man-hours.

SECTION-14

SPECIAL CONDITIONS OF CONTRACT

INSURANCE

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

15.1 EARNEST MONEY DEPOSIT:

EARNEST MONEY DEPOSIT FOR THIS TENDER WILL BE Rs. 2,00,000/- (RUPEES TWO LACS ONLY).

ONE TIME EMD WILL ALSO BE Rs. 2 LACS.

EMD SHALL BE DEPOSITED IN CASH (AS PERMISSIBLE UNDER INCOME TAX ACT), PAY ORDER OR DEMAND DRAFT (PAYABLE AT NAGPUR IN FAVOUR OF 'BHARAT HEAVY ELECTRICALS LIMITED') ONLY. **NO OTHER FORM OF EMD REMITTANCE SHALL BE ACCEPTABLE TO BHEL.**

EMD BY THE TENDERER WILL BE FORFEITED AS PER TENDER DOCUMENTS IF

- I) AFTER OPENING THE TENDER, THE TENDERER REVOKES HIS TENDER WITHIN THE VALIDITY PERIOD OR INCREASES HIS EARLIER QUOTED RATES.
- II) THE TENDERER DOES NOT COMMENCE THE WORK WITHIN THE PERIOD AS PER LOI / CONTRACT. IN CASE THE LOI / CONTRACT IS SILENT IN THIS REGARD THEN WITHIN 15 DAYS AFTER AWARD OF CONTRACT.

EMD SHALL NOT CARRY ANY INTEREST.

15.2 SECURITY DEPOSIT

15.2.1 SECURITY DEPOSIT SHOULD BE COLLECTED FROM THE SUCCESSFUL TENDERER. THE RATE OF SECURITY DEPOSIT WILL BE AS BELOW:

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

THE SECURITY DEPOSIT SHALL BE REMITTED BEFORE START OF THE WORK BY THE CONTRACTOR IN THE MANNER SPECIFIED AS FOLLOWS.

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

- I) CASH (AS PERMISSIBLE UNDER THE INCOME TAX ACT)
- II) PAY ORDER, DEMAND DRAFT IN FAVOUR OF BHEL.

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

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

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

BANK GUARANTEE FROM SCHEDULED BANKS / PUBLIC FINANCIAL INSTITUTIONS AS DEFINED IN THE COMPANIES ACT SUBJECT TO A MAXIMUM OF 50% OF THE TOTAL SECURITY DEPOSIT VALUE. THE BALANCE 50% HAS TO BE REMITTED EITHER BY CASH OR IN THE OTHER FORM OF SECURITY. THE BANK GUARANTEE FORMAT SHOULD HAVE THE APPROVAL OF BHEL.

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.

SECURITY DEPOSIT CAN ALSO BE RECOVERED AT THE RATE OF 10% FROM THE RUNNING BILLS. HOWEVER IN SUCH CASES AT LEAST 50% OF THE SECURITY DEPOSIT SHOULD BE REMITTED (BY BANK GUARANTEE OR DEMAND DRAFT) BEFORE START OF THE WORK AND THE BALANCE 50% MAY BE RECOVERED FROM THE RUNNING BILLS.

EMD OF THE SUCCESSFUL TENDERER, EXCEPTING THOSE WHO HAVE REMITTED ONE TIME EMD, SHALL BE CONVERTED AND ADJUSTED AGAINST THE SECURITY DEPOSIT OR SPECIFIC REQUEST BY THE CONTRACTOR.

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.

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

APPENDIX-I

QUNATITATIVE INFORMATIONS

Sl.No.	WORK CATEGORY	MATERIAL CATEGORY	APPROX WEIGHT IN MT (PIPE AND FITTINGS ONLY)	MATERIAL SPEC
01	IBR	CARBON STEEL	650	PIPE: A 106 Gr-B, FITTINGS : A105/ A234 WPB, VALVES: A216 WCB/ A105
02	IBR	ALLOY STEEL	310	PIPE: A 335 P11, FITTINGS : A182 F11&F22/A234WP11&WP22, VALVES: A217 WC6 /A217WC9 / A182 F11&F22
03	NON-IBR	CARBON STEEL & GI	1364	PIPE: A 106 Gr-B, FITTINGS : A105/ A234 WPB, VALVES: A216 WCB/ A105
04	NON-IBR	SS	16	Pipe A 312 TP321; Fittings A182 F321/ A403 WP321; Valves A351CF8 / A182 F321
05	MAIN AND OTHER CW PIPING (LARGE DIA PIPES)	MS/ CS	60	IS3589

NOTE : 1. THE ABOVE INFORMATION ARE INDICATIVE ONLY AND ARE LIKELY TO AS PER FINAL ENGINEERING OF RESPECTIVE SYSTEMS/ PIPING ETC. WORK SHALL BE EXECUTED AS PER THE RELEVANT DOCUMENTS/ DRAWINGS PROVIDED IN THE COURSE OF WORK.

2. NO CLAIM WHATSOEVER SHALL BE ENTERTAINED FOR ANY VARIATION IN THE QUANTITIES INDICATE ABOVE.

**APPENDIX-II
PRELIMINARY BOQ**

A	G.I. Piping	Size	Pipe (m)	Remarks
		3/4"	800	
		1"	1200	
		2"	1600	
B	S.S. Piping	Size	Pipe (m)	Remarks
		3/4"	100	
		1"	500	
		1 1/2"	24	
		18	200	
C	A.S. Piping	Size	Pipe (m)	Remarks
		3/4"	2800	
		1"	300	
		1 1/2"	120	
		2"	450	
		3"	90	5.49, 7.62, 15.49- 30m
		4"	350	6.02- 8.56mm
		6"	240	10.97, 18.26mm- 90m
		8"	120	8.18, 23.01- 50m
		10"	240	9.27, 28.58- 180m
		12"	280	33.32mm
		16"	240	40.49 Thk.
		18"	120	23.83 Thk.
D	C.S. Piping	Size	Pipe (m)	Remarks
		1/2"	1500	
		3/4"	6000	
		1"	1600	
		1 1/2"	1650	
		2"	1800	
		3"	2600	
		4"	1800	
		6"	2200	
		8"	3000	
		10"	1200	
		12"	300	
		14"	180	
		16"	600	
		18"	200	
		20"	300	
		22"	116	
		24"	680	
		28"	96	12 mm thk
		30"	280	12 mm thk, Buried CW line

38"	280	12 mm thk, Buried CW line
40"	120	12 mm thk, Buried CW line
48"	190	12 mm thk, Buried CW line
68"	96	18 mm thk, Buried CW line
82"	288	18 mm thk, Buried CW line
96"	60	20 mm thk, Buried CW line

TOTAL WEIGHT OF ALL VALVES: 192 MT (INCLUDINNG IBR, NON-IBR ETC

NOTE: LIST OF IBR AND NON-IBR PIPING FURNISHED SEPARATELY AS PDF DOCUMENT.
 {Uploaded in website as part of corrigendum 01 (www.bhel.com → Tender Notifications → View Corrigendum)}

APPENDIX-III

LIST OF T&P TO BE PROVIDED BY BHEL FREE OF HIRE CHARGES ON SHARING BASIS			
SN	DESCRIPTION & CAPACITY OF T&P	QUANTITY	REMARKS
01	CRAWLER CRANE CAPACITY-75 MT/ 100 MT	01	THIS CRANE IS HIRED BY BHEL.
02	CHEMICAL CLEANING PUMPS 150 TPH	03 Nos.	FOR CHEMICAL CLEANING. THESE ARE ISSUED TO BOILER ERECTION AGENCY AND THE CONTRACTOR SHALL SHARE THE SAME. REFER CLAUSE 4.8.3
03	HYDRO TEST PUMP CAPACITY -250/450 KG/CM ²	01 No.	THIS WILL BE ISSUED ON SHARING BASIS
04	PIPING AND STRUCTURAL ITEMS FOR CHEMICAL CLEANING TEMPORARY SET UP	AS PER SITE REQUIREMENT	

NOTES:

1. BHEL WILL MAKE AVAILABLE THE CRANE ON SHARING BASIS MAINLY FOR THE PURPOSE OF:
 - (i) PRE-ASSEMBLY AND ERECTION.
 - (ii) ANY OTHER ERECTION RELATED ACTIVITY AT THE DISCRETION & APPROVAL OF BHEL SITE INCHARGE.
2. BHEL WILL NOT PROVIDE THEIR CRANE FOR LOADING & UNLOADING OF MATERIAL AT STORAGE YARD AND UNLOADING AND LOADING AT SITE.
3. CONTRACTOR SHALL PROVIDE THE FUEL FOR THE CRANES FOR CONTRACTOR'S USE.
4. ALSO REFER SECTION-7 OF SPECIAL CONDITIONS OF CONTRACT.
5. THE CRANES HAVE TO BE SHARED WITH OTHER AGENCIES / CONTRACTORS OF BHEL. THE ALLOCATION OF CRANES SHALL BE THE DISCRETION OF BHEL ENGINEER, WHICH SHALL BE BINDING ON THE CONTRACTOR.

APPENDIX-IV

LIST OF T&P AND MMD TO BE DEPLOYED BY THE CONTRACTOR

A: TOOL & PLANTS

SN	DESCRIPTION	CAPACITY (MINIMUM)	MINIMUM QUANTITY
	PICK AND CARRY MOBILE CRANE	8 – 10 T	01 No.-TO BE DEPLOYED AT STORAGE YARD/ ERECTION SITE FROM THE BEGINNING.
2	TRACTOR TROLLEY	ADEQUATE CAP TO HANDLE COMPONENTS OF PIPING ETC	01 – FROM THE BEGINNING
3	AIR COMPRESSOR (ELECTRIC/DIESEL) – 7 Kg/cm ²	140 CFM	01- FROM THE BEGINNING
4	3 Ph DISTRIBUTION BOARD, CABLES ETC WITH COMPLETE SET UP FOR DRAWL OF CONSTRUCTION POWER	400 Amp, 415 Volt	AS PER REQMT
5	TIG WELDING SET	-	AS REQUIRED
6	PRE HEATING / STRESS RELIEVING SET (HEATING CONTROL PANEL, CABLES, HEATING ELEMENTS ETC.)	AS PER REQUIREMENT	1 SET
7	WELDING GENERATOR (ELECTRIC & DIESEL)	300 AMPS	AS REQUIRED
8	ELECTRO-HYDRAULIC PIPE BENDING MACHINE	2" Nb X 12MM THICK PIPE	AS PER SITE REQUIREMENT
9	RADIOGRAPHY ARRANGEMENT INCLUDING THE SOURCE	IR 192	1 SET EACH
10	RADIOGRAPHY FILM VIEWER	HI INTENSITY	2 NOS.
11	PIPE BENDING MACHINE – HAND OPERATED	UP TO 50 mm Nb PIPES	AS PER SITE REQUIEREMENT
12	BAKING OVEN AND HOLDING OVEN WITH THERMOSTAT AND TEMPERATURE GAUGE FOR BAKING COATED WELDING ELECTRODES	AS PER REQUIREMENT	02 EACH
13	PORTABLE OVEN FOR COATED WELDING ELECTRODES	AS PER SITE REQUIREMENT	AS PER REQUIREMENT
14	DEWATERING PUMP –VACUUM SUCTION, COMPLETE WITH MOTOR, STARTER, CABLES, SWITCHES ETC.	10 HP	AS PER REQUI'MENT

SN	DESCRIPTION	CAPACITY (MINIMUM)	MINIMUM QUANTITY
15	DEWATERING PUMP –VACUUM SUCTION, COMPLETE WITH MOTOR, STARTER, CABLES, SWITCHES ETC.	5 HP	2 NOS.
16	DEWATERING PUMP, COMPLETE WITH MOTOR, STARTER, CABLES, SWITCHES ETC.	1 HP	2 NOS.
17	CENTRIFUGAL PUMP WITH MOTOR, STARTER PANEL, CABLES BETWEEN STARTER PANEL AND MOTORS, INLET AND OUT LET VALVES FOR THE PUMPS FOR FILLING AND HYDRAULIC TESTING OF THE SYSTEM	150-200 TPH	2 SETS
18	HYDRAULIC TEST PUMPS (OF CAPACITY OTHER THAN THOSE PROVIDED BY BHEL), COMPLETE WITH MOTOR, STARTER, CABLES, SWITCHES ETC.	SUITABLE TO REQUIREMENT	2 NOS
19	BLANKS/ DISHED ENDS FOR HYD. TESTING OF PIPES/ ASSEMBLIES – REF CL. 4.1.2.26	SIZES IDENTIFIED IN PRELIMINARY BOQ FURNISHED HEREIN	2 SETS EACH
20	COMPLETE FACILITIES FOR FABRICATION AND TESTING EQUIPMENTS AS PER REQUIREMENT OF IBR FOR IBR PIPES FABRICATED AT SITE	ADEQUATE TO MEET SITE REQUIREMENT	TO SUIT SITE REQUIREMENT

B: MEASURING AND MONITORING DEVICES (MMD):

AS PER REQUIREMENT TO BE FINALIZED AT SITE, SHALL MEET THE REQUIREMENTS AS PER FIELD QUALITY PLAN AND OTHER ERECTION, TESTING RELATED ACTIVITIES.

NOTE:

1. THE LIST INDICATED ABOVE IS ONLY SUGGESTIVE AND NOT EXHAUSTIVE. CONTRACTOR SHALL DEPLOY ALL OTHER T&P AND MMD AS WELL THAT ARE NECESSARY FOR PROPER EXECUTION OF THE SCOPE OF WORK.

APPENDIX-V

DOCUMENTS FURNISHED

SL.NO.	DESCRIPTION	DRG/DOC/EIL SPEC NO.
1.	PIPING LAYOUT FOR COOLING WATER & UTILITY	0-381-01-00817 REV 00 (###)
2.	PIPING LAYOUT ON PIPE RACK AT BATTERY LIMIT	0-381-01-02746 REV 00 (###)
3.	CORROSION PROTECTION OF U/G PLANT PIPING	6743-31-0642-CTE-SP-C06 REV-0 (\$\$\$)
4.	STANDARD SPECIFICATION FOR POSITIVE MATERIAL IDENTIFICATION AT CONSTRUCTION SITES	6-82-0002 REV 0 (\$\$)

NOTE:

1. THE ABOVE DOCUMENT / DRAWINGS ARE ONLY FOR INFORMATION AND LATEST APPLICABLE VERSION OF THESE WHICH WILL BE PROVIDED DURING THE COURSE OF WORK HAVE TO BE USED FOR COMPLETING THE WORK ACCORDINGLY.

2. ALL OTHER APPLICABLE DOCUMENTS/DRAWINGS AND SPECIFICATIONS ETC WILL BE PROVIDED DURING THE COURSE OF WORK.

###: These drawings are not uploaded in our website. Hence all interested Bidders who have downloaded the tender documents from BHEL website (www.bhel.com → Tender Notifications) may obtain hard copy of these Drawings from BHEL/PSWR, Nagpur on specific request to DGM/Purchase, BHEL Nagpur.

\$\$\$: Uploaded in website as part of corrigendum 01 (www.bhel.com → Tender Notifications → View Corrigendum)

APPENDIX-VI

ANALYSIS OF UNIT RATE QUOTED

SL.N O.	DESCRIPTION	% OF QUOTED RATE	REMARKS
01	SITE FACILITIES VIZ., ELECTRICITY, WATER OTHER INFRASTRUCTURE.		
02	SALARY AND WAGES + RETRENCHMENT BENEFITS		
03	CONSUMABLES		
04	T&P DEPRECIATION & MAINTENANCE		
05	ESTABLISHMENT & ADMINISTRATIVE EXPENSES		
06	OVERHEADS		
07	PROFIT		
TOTAL		100%	

SIGNATURE OF THE TENDERER

DATE:

APPENDIX–VII

FORMAT FOR MONTHWISE DEPLOYMENT PLAN FOR MAJOR TOOLS & PLANTS BY CONTRACTOR

	DESCRIPTION	CAPACITY	MONTHS											
			1	2	3	4	5	6	7	8	9	10	11	12
01	PICK AND CARRY MOBILE CRANE	8 – 10 T												
02	TRUCK TRACTOR TROLLEY	7-9 T												
03	AIR COMPRESSOR (ELECTRIC/DIESEL) – 7 Kg/cm ²	140 CFM												
04	3 Ph DISTRIBUTION BOARD, CABLES ETC WITH COMPLETE SET UP FOR DRAWL OF CONSTRUCTION POWER	400 Amp, 415 Volt												
05	TIG WELDING SET	-												
06	PRE HEATING / STRESS RELIEVING SET (HEATING CONTROL PANEL, CABLES, HEATING ELEMENTS ETC.)	AS PER REQUIREMENT												
07	WELDING GENERATOR (ELECTRIC & DIESEL)	300 AMPS												
08	ELECTRO-HYDRAULIC PIPE BENDING MACHINE	2" Nb X 12MM THICK PIPE												
09	RADIOGRAPHY ARRANGEMENT INCLUDING THE SOURCE	IR 192												
10	RADIOGRAPHY FILM VIEWER	HI INTENSITY												
11	PIPE BENDING MACHINE – HAND OPERATED	UP TO 50 mm Nb PIPES												
12	BAKING OVEN AND HOLDING OVEN WITH THERMOSTAT AND TEMPERATURE GAUGE FOR BAKING COATED WELDING ELECTRODES	AS PER REQUIREMENT												

13	PORTABLE OVEN FOR COATED WELDING ELECTRODES	AS PER SITE REQUIREMENT													
14	DEWATERING PUMP –VACUUM SUCTION, COMPLETE WITH MOTOR, STARTER, CABLES, SWITCHES ETC.	10 HP													
15	DEWATERING PUMP –VACUUM SUCTION, COMPLETE WITH MOTOR, STARTER, CABLES, SWITCHES ETC.	5 HP													
16	DEWATERING PUMP, COMPLETE WITH MOTOR, STARTER, CABLES, SWITCHES ETC.	1 HP													
17	CENTRIFUGAL PUMP WITH MOTOR, STARTER PANEL, CABLES BETWEEN STARTER PANEL AND MOTORS, INLET AND OUT LET VALVES FOR THE PUMPS FOR FILLING AND HYDRAULIC TESTING OF THE SYSTEM	150-200 TPH													
18	HYDRAULIC TEST PUMPS (OF CAPACITY OTHER THAN THOSE PROVIDED BY BHEL), COMPLETE WITH MOTOR, STARTER, CABLES, SWITCHES ETC.	SUITABLE TO REQUIREMENT													
19	COMPLETE FACILITIES FOR FABRICATION AND TESTING EQUIPMENTS AS PER REQUIREMENT OF IBR FOR IBR PIPES FABRICATED AT SITE	ADEQUATE TO MEET SITE REQUIREMENT													

APPENDIX-VIII

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

SL	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	MATLS MANAGEMENT SUPERVISORS													
08	IBR PIPE WELDERS													
09	NON-IBR PIPE & OTHER WELDERS													
10	FITTERS													
11	CRANE OPERATOR													
12	TRUCK/TRAILER DRIVERS													
13	STORE KEEPERS													
14	ELECTRICIANS													
	SEMISKILLED/ UNSKILLED WORKERS													
	MONTH WISE TOTAL													

SIGNATURE OF BIDDER

DATE:

APPENDIX-IX

CONCURRENT COMMITMENTS

SL.NO	FULL POSTAL ADDRESS OF CLIENT AND NAME OF OFFICER IN-CHARGE	DESCRIPTION OF THE WORK	VALUE OF THE CONTRACT	COMMENCEMENT DATE	SCHEDULED COMPLETION	% COMPLETED. AS ON DATE	ANTICIPATED COMPLN. DATE	REMARKS

DATE:

SIGNATURE OF THE TENDERER

APPENDIX-X

DETAILS OF SIMILAR WORK DONE DURING THE LAST SEVEN YEARS

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

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

DATE

SIGNATURE OF TENDERER WITH SEAL