

TENDER SPECIFICATION

No. BHE/PW/PUR/KNT-PPE/584

COLLECTION OF MATERIALS FROM BHEL/CLIENT'S STORES/STORAGE YARD INCLUDING LOADING; TRANSPORTATION TO SITE; ERECTION, TESTING AND ASSISTANCE FOR COMMISSIONING AND HANDING OVER OF COMPLETE POWER CYCLE PIPING INCLUDING P-91 MATERIAL PIPING, REGENERATIVE SYSTEM PIPING, TG CYCLE PIPING AND LOW PRESSURE PIPING WITH ASSOCIATED FITTINGS, VALVES, SUPPORTS AND TANKS & VESSELS ETC

FOR

UNIT # 7 OF STAGE-III 1X500MW

AT

KORBA THERMAL POWER STATION,
NTPC, KORBA, CHHATTISGARH.

Part I - Technical Bid

Book no. :



Bharat Heavy Electricals Limited
(A Government Of India Undertaking)
Power Sector : Western Region
345, Kingsway : Nagpur 440 001

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LEGEND:

\$: Attached at the end of hard copy of Tender Specifications Part-I. Hosted in BHEL web page (www.bhel.com) as file titled “**NIT+GCC-584**”.

@: Issued as separate hard copy booklet ‘Tender Specifications Part-II (Price Bid)’. Hosted in BHEL web page (www.bhel.com) as files titled “**PRICE BID-584**”

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-584**”

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

TENDER SPECS. NO. : BHE/PW/PUR/KNT-PPE/ 584

COLLECTION OF MATERIALS FROM BHEL/CLIENT'S STORES/STORAGE YARD INCLUDING LOADING; TRANSPORTATION TO SITE; ERECTION, TESTING AND ASSISTANCE FOR COMMISSIONING AND HANDING OVER OF COMPLETE POWER CYCLE PIPING INCLUDING P-91 MATERIAL PIPING, REGENERATIVE SYSTEM PIPING, TG CYCLE PIPING AND LOW PRESSURE PIPING WITH ASSOCIATED FITTINGS, VALVES, SUPPORTS AND TANKS & VESSELS ETC

FOR

UNIT # 7 OF STAGE-III 1X500MW

AT

KORBA THERMAL POWER STATION,
NTPC, KORBA, CHHATTISGARH

Earnest Money Deposit : Rs.2,00,000.00 (Rupees two lacs 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.....

.....

.....
(These tender documents are not transferable)

For Bharat Heavy Electricals Limited

Dy. Gen Manager (Purchase)

Place: Nagpur

Date:

Procedure for Submission of Sealed Tenders & Instructions to Bidders

The bidder must submit their tenders as required in two parts in separate sealed covers prominently super scribed as part-I technical bid and part-II price bid and also indicating on each of the covers the tender specification number and due date and time as mentioned in the tender notice.

Part-I (technical bid) cover-I:

Excepting rate schedule, all other schedules, data sheets and details called for in the specification shall be enclosed in part-I "Technical Bid" only.

EARNEST MONEY DEPOSIT (EMD)

EMD shall be included in the Technical Bid. **EMD shall be paid by bidders only in the form of account payee Demand Draft payable at Nagpur in favour of Bharat Heavy Electricals Limited.** No other mode of payment of EMD shall be acceptable. Provisions under clause no. 1.4 of the General Conditions of the Contract shall stand withdrawn for this tender.

Bidder may opt to deposit "One Time EMD" of Rs. 2.0 lacs with this office (BHEL:PSWR:Nagpur) which will enable them to participate in all the future tender enquiries in respect of Erection and Commissioning services issued from this office. Interested bidders may clearly sent their consent for converting the present EMD into an "One Time EMD" in their offer.

Bidders who have already submitted such "One Time EMD" will be exempted from submission of any EMD for this tender. However bidder shall furnish details of the "One Time EMD" in his offer including the Check List furnished herein.

Part-II (price bid) cover-II:

All indications of price shall be given in this part-II "Price Bid". **EMD shall not be included in this cover.**

These two separate covers-I and II (part-I and part-II) shall together be enclosed in a third envelope (cover-III) along with requisite EMD as indicated earlier and this sealed cover shall be super scribed and submitted to Addl. Gen Manager (Purchase) at the above-mentioned address on or before the due date as indicated.

The qualified bidder will be intimated separately about the status of their offer.

Bidder are requested to make specific note of the following conditions:

Contractor should have adequate resources including major T&P at his disposal for this job.

Contractor should have sound financial stability.

Bidder 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 bidder 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.

Bidder shall note that their offer will be considered subject to the approval of BHEL's customer.

PROJECT INFORMATION

1.00.00 BACKGROUND

Korba Super Thermal Power Project, Stage-III (1x500MW), a pit head coal based Thermal Power Project, is located in Korba district of Chattisgarh state. Stage-I (3x200 MW) and Stage-II (3x500 MW) of the project are under commercial operation. basic inputs i.e., coal, water and land have already been tied up. the project is proposed to be implemented as merchant plant for the benefits of states and units of western region.

1.01.01 LOCATION AND APPROACH

The site is located on the western bank of river Hasdeo near Korba town in Korba district of Chhattisgarh State. The site is contiguous to the right bank irrigation canal originating from Hasdeo barrage. BALCO'S Aluminium plant and two power stations are already located on both the banks of Hasdeo river in the vicinity.

Korba town is a broad gauge railhead 37 kms. away from Champa railway station on Kolkata-Nagpur main line of south-eastern central railway and is approximately 510 kms from Nagpur by rail. the site is very close to all weather road between Kotghora & Korba and is approximately 110 kms from Bilaspur and 10 kms from Korba town. the nearest airport is Raipur located at a distance of approximately 250 kms from the project site.

Checklist

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

1	Name of the bidder with address	
2	Nature of the firm	
3	EMD details (EMD Payable : Rs 2.0 lacs in the form of Demand Draft in favour of Bharat Heavy Electricals Limited, payable at Nagpur	
4	Validity of offer (Required : 6 months from Due Date)	
5	Mobilization time (Required : Not exceeding 30 days from fax LOI)	
6	Whether no deviation certificate furnished	Yes No
7	Bidder has visited the project site and acquainted with the site conditions	Yes No
8	Details of concurrent jobs are furnished (as per Appendix-VIII)	Yes No
9	Head Quarter's Organization Chart is furnished	Yes No
10	Proposed site organisation is furnished	Yes No
11	Financial status of the company (annexure 'a' of GCC) is furnished	Yes No
12	Profit & loss account for preceding three years is furnished	Yes No
13	Latest solvency certificate from the banker is furnished	Yes No
14	Latest income tax clearance certificate is furnished	Yes No
15	Manpower deployment plan (appendix-VI) is furnished	Yes No
16	Month wise deployment plan for major T&P (appendix-VIII) is furnished	Yes No
17	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/KNT-PPE/584 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 bidder and a valid power of attorney to this effect is also enclosed.**

Authorized representative's signature with
Name and address

Date:

Bidder's Name and Address

Certificate of No Deviation

Tender Specification No.

BHE/PW/PUR/KNT-PPE/584

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.

Date:

Signature of the Bidder

Section-3
Offer of the Contractor

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

Dear sir,

I/we hereby offer to carry out the work detailed in tender specification no. BHE/PW/PUR/KNT-PPE/584 issued by Bharat Heavy Electricals Limited, Power Sector-Western Region, Nagpur, in accordance with the terms and conditions thereof.

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

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

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

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

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

Place:
Date :

Signature Of Bidder:
Address:

Witnesses With Their Address

Signature	Name	Address
1.		
2.		

Section-4

Special Conditions of Contract

4.0 BROAD SCOPE OF WORK

THE SCOPE OF WORK COVERS THE COMPLETE WORK OF COLLECTION OF MATERIALS FROM BHEL/CLIENT'S STORES/STORAGE YARD INCLUDING LOADING; TRANSPORTATION TO SITE; ERECTION, TESTING AND ASSISTANCE FOR COMMISSIONING AND HANDING OVER OF COMPLETE POWER CYCLE PIPING INCLUDING P-91 MATERIAL PIPING, REGENERATIVE SYSTEM PIPING, TG CYCLE PIPING AND ALL LOW PRESSURE PIPING WITH ASSOCIATED FITTINGS, VALVES, SUPPORTS ETC AND TANKS & VESSELS. THE WORK IS MAINLY CATEGORISED AS FOLLOWS:

- 1) ERECTION, TESTING AND COMMISSIONING OF POWER CYCLE PIPING INCLUDING P-91 PIPING
- 2) ERECTION TESTING AND COMMISSIONING OF SG CYCLE PIPING
- 3) ERECTION, TESTING AND COMMISSIONING OF TG CYCLE PIPING PIPING
- 4) ERECTION, TESTING AND COMMISSIONING OF TANKS & VESSELS ETC
- 5) ASSEMBLY, PLACEMENT, ALIGNMENT AND FIXING OF VIS(VIBRATION ISOLATION SYSTEMS) OR TG DECK, FOUNDATIONS OF OTHER ROTATING MACHINES OF TG AND BOILER FOR EXAMPLE, FEED PUMPS AND FANS ETC.

4.1 GENERAL RESPONSIBILITIES

4.1.1

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

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

4.1.3

THE WORK SHALL BE EXECUTED UNDER THE USUAL CONDITIONS AFFECTING MAJOR POWER PLANT CONSTRUCTION AND IN CONJUNCTION WITH NUMEROUS OTHER OPERATIONS AT SITE. THE CONTRACTOR AND HIS PERSONNEL SHALL

COOPERATE WITH PERSONNEL OF CUSTOMER'S CONTRACTOR'S, COORDINATING HIS WORK WITH OTHERS AND PROCEED IN A MANNER THAT SHALL NOT DELAY OR HINDER THE PROGRESS OF WORK AS A WHOLE.

4.1.4

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.

4.1.5

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.

4.1.6

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

4.1.7

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.

4.1.8

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

CONTRACTOR IF ANY, FOR SUCH WORKS WILL BE GOVERNED BY CLAUSES 13.1 TO 13.8.

4.1.9

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

4.1.10

THE CONTRACTOR SHALL PROVIDE, 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.

4.1.11

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

4.1.12

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

4.1.13

CONTRACTOR SHALL PLAN AND TRANSPORT EQUIPMENTS, COMPONENTS FROM STORAGE TO ERECTION SITE AND ERECT THEM IN SUCH A MANNER AND SEQUENCE THAT MATERIAL ACCUMULATION AT SITE DOES NOT LEAD TO CONGESTION AT SITE OF WORK. MATERIALS SHALL BE STACKED NEATLY, PRESERVED AND STORED IN THE CONTRACTOR'S SHED AND AT WORK AREAS IN AN ORDERLY MANNER. IN CASE IT IS NECESSARY TO SHIFT AND RE-STACK THE MATERIALS KEPT AT WORK AREAS/ SITE TO ENABLE OTHER AGENCIES TO CARRY OUT THEIR WORK OR FOR

ANY OTHER REASON, CONTRACTOR SHALL DO IT MOST EXPEDITIOUSLY. NO CLAIM FOR EXTRA PAYMENT FOR SUCH WORK WILL BE ENTERTAINED.

4.1.14

THE RATES QUOTED IN RATE SCHEDULE SHALL BE INCLUSIVE OF WELDING, BOLTING, FASTENING, JOINTING 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.

4.1.15

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.

4.1.16 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.

4.1.17

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

4.1.18

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

4.1.19

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

4.1.20

THE CONTRACTOR SHALL NOT WASTE ANY MATERIALS ISSUED TO HIM. IN CASE IT IS OBSERVED AT ANY STAGE THAT THE WASTAGE/EXCESS UTILIZATION OF MATERIALS IS NOT WITHIN THE PERMISSIBLE LIMITS, RECOVERY FOR THE EXCESS QUANTITY USED OR WASTED WILL BE AFFECTED WITH DEPARTMENTAL CHARGES

FROM THE CONTRACTOR. THE ALLOWANCE TOWARDS SUCH WASTAGE SHALL BE IN LINE WITH STANDARD ENGINEERING PRACTICES, STANDARDS/ CODES AS MAY BE APPLICABLE. DECISION OF BHEL ON THIS WILL BE FINAL AND BINDING ON THE CONTRACTOR. IN ADDITION TO ABOVE, THERE COULD BE INVISIBLE SCRAP/ WASTAGE I.E. WHICH CAN NOT BE SEEN PHYSICALLY AND LOST IN THE PROCESS. THE TOTAL OF INVISIBLE SCRAP/ WASTE SHALL NOT EXCEED 1%.

4.1.21

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

4.1.22

ALL TEMPORARY LINES 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.

4.1.23

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

4.1.24

ALL ELECTRICAL MOTORS HAVE TO BE TESTED FOR IR & PI VALUES 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.

4.1.25

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.

4.1.27

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.

4.1.28

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.

4.1.29

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

4.1.30

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

4.2 TAKING OVER AND DRESSING OF FOUNDATIONS, GROUTING OF EQUIPMENTS

4.2.1

BUILDING AND FOUNDATION FOR SUPPORTING STRUCTURES, EQUIPMENTS UNDER SCOPE OF THIS TENDER SPECIFICATION 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. 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. CONTRACTOR SHOULD LOG BEFORE TAKING OVER THE FOUNDATIONS. DRESSING AND CHIPPING OF FOUNDATIONS TO THE EXTENT OF 25MM FOR ACHIEVING PROPER LEVELS IS WITHIN THE SCOPE OF WORK.

4.2.2

FIXING OF ANCHOR POINTS REQUIRED FOR INSTALLING PIPES, SUPPORTS, HANGERS, EQUIPMENTS ARE IN THE SCOPE OF CONTRACTOR INCLUDING ASSOCIATED CIVIL WORK OF DRILLING, FIXING ANCHOR BOLTS, CHIPPING HOLES, GROUTING ETC. SHALL BE IN THE SCOPE OF REGULAR WORK. NECESSARY STEEL AND ANCHOR BOLTS WILL BE PROVIDED BY BHEL. HOWEVER CONTRACTOR SHALL ARRANGE THE GROUTING CEMENT, QUICK-SETTING FREE-FLOW GROUT COMPOUND WITHIN THE QUOTED PRICE.

4.2.3

CONTRACTOR SHALL CARRY OUT ALL WORKS NECESSARY FOR GROUTING OF STATIC AND ROTATING EQUIPMENTS AS A PART OF THE WORK IN SCOPE HEREIN. THE SCOPE SHALL INCLUDE CLEANING THE MAIN FOUNDATION/PEDESTAL OF OIL, GREASE AND OTHER UNWANTED CONTAMINANTS & DEPOSITS; COMPRESSED AIR BLOWING, WATER WASHING, ROUGHENING THE SURFACE, FORM-WORK/MOULD, MIXING AND POURING OF GROUT MIX, SMOOTH FINISHING, CURING, PREPARATION OF TEST COUPONS, GETTING THEM TESTED IN AN APPROVED LABORATORY. CONTRACTOR SHALL USE ONLY APPROVED GROUT MATERIALS LIKE CONBEXTRA GP-1 AND CONBEXTRA GP-2 FOR GROUTING.

4.3.0 ERECTION OF PIPING SYSTEM

4.3.1

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

4.3.2

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

4.3.3

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

4.3.4 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. REQUIRED GASKETS WILL BE SUPPLIED BY BHEL FREE OF COST.
2. MATCHING OF FLANGES FOR ACHIEVING PARALLELISM AND ALIGNMENT RESORTING TO HEAT CORRECTION OR OTHER SUITABLE METHODS AS PER INSTRUCTIONS OF BHEL ENGINEERS.
3. TO LOCATE THE CAUSE OF VIBRATIONS IN PUMPS OR OTHER AUXILIARIES AND TO CARRY OUT NECESSARY CORRECTIONS IN PIPING AND ITS SUPPORTS. THIS MAY INVOLVE CUTTING, FRESH EDGE PREPARATION, WELDING, RADIOGRAPHY, STRESS RELIEVING, ETC., OF SUCTION, DISCHARGE, RE-CIRCULATING AND OTHER CONNECTED PIPING AND ITS SUPPORTS AT NUMBER OF PLACES.
4. INCREASE OR DECREASE IN LENGTH OF PIPING INCLUDING CHANGE IN LAYOUT TO SUIT SITE CONDITIONS.
5. FABRICATION AND ERECTION OF RACKS AND STEEL SUPPORTS FOR ALL THE PIPING INCLUDING OF SYSTEM PIPING. STEEL FOR THIS PURPOSE WILL BE SUPPLIED BY BHEL IN RANDOM SIZES.
6. ERECTION, WELDING, NDE AND STRESS RELIEVING OF CERTAIN EQUIPMENTS, E.G. FLOW NOZZLES, CONTROL VALVES ETC, AFTER COMPLETION OF CERTAIN ACTIVITIES E.G. CHEMICAL CLEANING, STEAM BLOWING ETC IS PART OF WORK. THIS MAY INVOLVE REMOVAL OF PORTIONS FROM THE ALREADY ERECTED PIPELINES IN ORDER TO INTRODUCE THESE EQUIPMENTS AND RESULTANT EDGE PREPARATION ETC SHALL BE INCIDENTAL TO WORK. NO SEPARATE/ ADDITIONAL PAYMENT IS ENVISAGED FOR CUTTING, WELDING AND EDGE PREPARATION IN THIS REGARD. THE REMOVED PIECES OF PIPES SHALL BE RETURNED TO BHEL STORES WITH PROPER CLEANING, DRESSING AND IDENTIFICATION MARKING.
7. MATCHING OF ALL FITTINGS LIKE TEES, BENDS, FLANGES, REDUCERS, VALVES, SOCKET FITTINGS, ETC WITH PIPES FOR WELDING. THIS MAY INVOLVE WELD BUILD UP, EDGE PREPARATION, ETC.
8. CLEANING OF ALL PIPES BY WIRE BRUSH AND FLUSHING BY COMPRESSED AIR.
9. WELDING OF ROOT VALVES WITH SMALL LENGTH OF PIPING TO THE PRESSURE, FLOW AND LEVEL TAPPING POINTS ON PIPING OR FLOW NOZZLES / ORIFICES / METERING ELEMENTS FIXED ON PIPING.
10. WELDING OF WELD BLANKS WITH DUE NDE & PWHT, IF REQUIRED, ON A TEMPORARY BASIS.

11. OPENING OF VALVE ACTUATORS, DISMANTLING OF ACTUATORS FROM THE VALVES, REFITTING AND RENDERING ASSISTANCE CONNECTED WITH THE ELECTRICAL AND MECHANICAL PROBLEMS.
12. FIXING AND WELDING INCLUDING DUE NDE & PWHT ETC OF CARRIER PLATES ON TO THE PIPES.

4.3.5

ON ALL STEAM PIPING, WATER (DM / RAW / CONDENSATE / COOLING) PIPING, OIL LINES / PIPING, INSTRUMENT AIR PIPING. SERVICE AIR PIPING, ETC, WHERE BUTT WELDING IS INVOLVED, ROOT TIG WELDING AND SUBSEQUENT ARC WELDING SHALL BE ADOPTED AS INSTRUCTED BY BHEL ENGINEER. THE DECISION OF BHEL ENGINEER REGARDING WELDING PROCEDURE FOR WELDING OF ABOVE LINES WILL BE BINDING ON THE CONTRACTOR.

4.3.6

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

4.3.7

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

4.3.9

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

4.3.10

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

4.3.11

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

4.3.12

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

4.3.13

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

4.3.14

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

4.3.15

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

4.3.16

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

4.3.17

ERECTION OF PIPING SYSTEMS SHALL BE COORDINATED BY THE CONTRACTOR AS REQUIRED, WITH THE ERECTION OF THE TURBINE, GENERATOR, CONDENSER, BOILER, BOILER FEED PUMPS AND OTHER

MAJOR EQUIPMENTS, APPROVAL MUST BE OBTAINED FROM THE CONCERNED BHEL ENGINEER AND OTHER AGENCIES CONCERNED PRIOR TO MAKING PIPING INTERFACE CONNECTIONS TO THE AFOREMENTIONED EQUIPMENTS. SEQUENCE OF WORK SHALL BE CAREFULLY PLANNED TO MINIMIZE INTERFERENCE WITH OTHER GROUPS WORKING IN THE SAME AREA. ACTUAL SEQUENCE TO BE FOLLOWED SHALL BE SUBJECT TO THE APPROVAL OF ENGINEER AND ENGINEERS MAY, AT TIME, DIRECT THE CONTRACTOR TO RESCHEDULE HIS WORK AS PER STATUS OF THE SITE WORK.

4.3.18

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

4.3.19

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

4.3.20

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

4.3.21

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

4.3.22

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

4.3.23

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

4.3.24

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

4.3.25

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

4.3.26

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

4.3.27

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

4.3.28

IN PIPELINES LIKE CRH LINES, EXTRACTION LINES, ETC., THE NRVS WILL BE ERECTED BY OTHER ERECTION AGENCY. ALIGNMENT OF THESE VALVES TO MATCH THE PIPE ENDS (BOTH SIDES), WELDING, HEAT TREATMENT AND NDE ETC., SHALL BE CARRIED OUT BY THE CONTRACTOR WITHIN THEIR QUOTED RATES. SIMILARLY, ABOVE SPECIFICATION WILL BE APPLICABLE TO STRAINERS COMING IN VARIOUS LINES.

4.3.29

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

4.3.30

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

4.3.31

NORMALLY, HANGERS SETTING IN COLD CONDITION ARE DONE BY SIMULATION ADDING ADDITIONAL TEMPORARY WEIGHT, WHICH WILL BE ROUGHLY EQUAL TO THE WEIGHT OF THE INSULATION. ATTACHMENT OF TEMPORARY WEIGHTS AND FLOATING OF THE JOINTS IN THE SIMULATION TEST TO BE TREATED AS PART OF JOB. HANGER SETTINGS HAVE TO BE

REPEATED FOR ACHIEVING FREE-FLOATING JOINTS. HANGER ADJUSTMENTS TO BE REPEATED FOR STEAM BLOWING BY RESETTING HOT AND COLD VALVES 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.

4.3.32

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

4.3.33

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

4.3.34

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

4.3.35

THE SCOPE OF WORK IN LP PIPING SYSTEMS/ SUB-SYSTEMS (AIR, WATER, OIL, 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 IF ANY, 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.

4.3.36

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.

4.3.37

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.

4.3.38

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

4.3.39

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

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

4.4.1 WELDING :

4.4.1.1

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

4.4.1.2

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

4.4.1.3

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

4.4.1.4

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

4.4.1.5

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

4.4.1.6

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

4.4.1.7

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

4.4.1.8

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

4.4.1.10

JOINT FIT UP WILL BE A STAGE OF INSPECTION.

4.4.1.11

ALL JOINTS SHALL BE OFFERED FOR VISUAL INSPECTION AFTER ROOT RUN. SUBSEQUENT WELDING SHOULD BE MADE ONLY AFTER THE APPROVAL OF ROOT RUN.

4.4.1.12

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

4.4.1.13

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

4.4.1.14

WELDING ELECTRODES, PRIOR TO THEIR USE, CALL FOR BAKING FOR SPECIFIED PERIOD AND WILL HAVE TO BE HELD AT SPECIFIED TEMPERATURE FOR SPECIFIED PERIOD. ALSO, DURING EXECUTION, THE WELDING ELECTRODES HAVE TO BE CARRIED IN PORTABLE OVENS DURING SHIFING FROM BACKING AND HOLDING OVEN. CONTRACTOR HAS TO MAKE SUFFICIENT NUMBER OF BACKING OVENS TO MEET THE REQUIREMENT.

4.4.2 HEAT TREATMENT:

4.4.2.1

PRE-HEATING, POST HEATING AND STRESS RELIEVING ARE PART OF ERECTION WORK AND SHALL BE PERFORMED BY THE CONTRACTOR IN ACCORDANCE WITH INSTRUCTIONS OF BHEL ENGINEER. DURING PREHEAT AND STRESS RELIEVING OPERATIONS THE TEMPERATURE SHALL BE MEASURED AS PER THE INSTRUCTIONS OF BHEL ENGINEERS BY THERMOCOUPLES AND RECORDED GRAPHS FOR THE HEAT TREATMENT

WORKS CARRIED OUT SHALL BE THE PROPERTY OF BHEL. THE CONTRACTOR HAS TO PROVIDE THERMO-CHALKS FOR CHECKING PREHEAT TEMPERATURE FOR WELDING OR FOR MONITORING TEMPERATURE OF METAL FOR HOT CORRECTION AS PER BHEL ENGINEER'S INSTRUCTIONS.

4.4.2.2

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

4.4.2.3

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

4.4.2.4

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

4.4.2.5

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

4.4.2.6

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

4.4.2.7

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

4.4.2.8

PREHEATING, INTER-PASS HEATING, POST WELD HEATING AND STRESS RELIEVING AFTER WELDING ARE PART OF ERECTION WORK AND SHALL BE PERFORMED BY THE CONTRACTOR IN ACCORDANCE WITH BHEL ENGINEER'S INSTRUCTIONS. WHERE

THE ELECTRIC RESISTANCE HEATING METHOD IS ADOPTED CONTRACTOR SHALL MAKE ALL ARRANGEMENT INCLUDING HEATING EQUIPMENT WITH AUTOMATIC RECORDING DEVICES, ALL HEATING ELEMENTS, THERMOCOUPLES AND ATTACHMENT UNITS, GRAPH SHEETS, THERMAL CHALKS, & INSULATING MATERIALS LIKE MINERAL WOOL, ASBESTOS CLOTH, CERAMIC BEADS, ASBESTOS ROPES ETC, REQUIRED FOR ALL HEATING AND STRESS RELIEVING WORKS.

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

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

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

4.4.2.8

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

4.4.2.9

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

4.4.2.10

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

NON DESTRUCTIVE EXAMINATION :

4.4.3.1

RADIOGRAPHIC INSPECTION OF WELDS SHALL BE ARRANGED BY THE CONTRACTOR INCLUDING ALL CONSUMABLES LIKE ISOTOPE CAMERA, FILM, CHEMICALS ETC. SCAFFOLDING AND APPROACHES FOR TAKING RADIOGRAPHS. THE NECESSARY SKILLED TECHNICIAN AND LABOURERS FOR TAKING THE RADIOGRAPHS SHALL BE PROVIDED BY THE CONTRACTOR.

WHILE TAKING RADIOGRAPHS, THE CONTRACTOR HAS TO USE PROPER PENETRANT / IMAGE QUALITY INDICATORS AS INSTRUCTED BY THE BHEL ENGINEER. ALL THE PROCESSED AND ACCEPTED FILMS WILL BE THE PROPERTY OF BHEL. IN THIS REGARD, THE CONTRACTOR HAS TO ADHERE TO THE SAFETY RULES / REGULATIONS LAID BY BARC AUTHORITIES FROM TIME TO TIME. IT MAY PLEASE BE NOTED THAT INVARIABLY THE RADIOGRAPHIC WORK WILL BE CARRIED AFTER THE NORMAL WORKING HOURS.

4.4.3.2

TENDERER SHALL NOTE THAT 100% RADIOGRAPHY SHALL BE TAKEN ON ALL HIGH PRESSURE WELDING TILL SUCH TIME THE WELDERS' PERFORMANCE IS FOUND BY BHEL ENGINEERS TO BE SATISFACTORY. SUBSEQUENTLY, SUBJECT TO CONSISTENCY IN WELDER'S PERFORMANCE. THE PERCENTAGE OF RADIOGRAPHY WILL BE BASED ON BHEL'S STANDARD PRACTICE/CODE REQUIREMENT. THE DEFECTS SHALL BE RECTIFIED IMMEDIATELY AND TO THE SATISFACTION OF BHEL ENGINEER. THE DECISION OF BHEL ENGINEER REGARDING ACCEPTANCE / REJECTING THE JOINTS WILL BE FINAL AND BINDING ON THE CONTRACTOR.

4.4.3.3

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

4.4.3.4

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

4.4.3.5

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

4.4.3.6

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

4.4.3.7

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

4.4.3.8

AFTER STRESS RELIEVING 5% OF UT FOR ALL CRITICAL LINES AND 2% OF UT FOR OTHER ALLOY STEEL LINES TO BE TAKEN TO ENSURE SOUNDNESS OF JOINTS PARTICULARLY STRESS RELIEVING CRACKS. NO SEPARATE PAYMENT WILL BE MADE.

4.4.3.9

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

4.4.3.10

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

4.4.3.11

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

4.4.3.12

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

4.4.3.13

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

4.5 PRE-COMMISSIONING, COMMISSIONING AND POST COMMISSIONING OF THE UNIT :

4.5.1 THE PIPING WORK IS RELATED TO VARIOUS COMMISSIONING ACTIVITIES OF THE POWER STATION AS FOLLOWS :

TRIAL RUN OF INDIVIDUAL EQUIPMENTS.

ALKALI FLUSHING OF BOILER FEED PIPING.

HYDRAULIC TEST OF BOILER

LIGHT UP OF BOILER

BOILER ALKALI BOIL OUT

BOILER ACID CLEANING.

ALKALI FLUSHING OF TG PIPING

TURBINE BARRING GEAR

TURBINE ROLLING

STEAM BLOWING OF BOILER SUPER HEATER AND STEAM PIPING

SAFETY VALVE FLOATING

SYNCHRONIZATION OF UNIT

COAL FIRING OF BOILER

FULL LOAD OPERATION OF THE UNIT.

THE ABOVE ACTIVITIES / TESTS / TRIAL RUNS MAY HAVE TO BE REPEATED TILL SATISFACTORY RESULTS ARE OBTAINED AND ALSO TO SATISFY THE REQUIREMENTS OF CUSTOMER /CONSULTANT / STATUTORY AUTHORITIES LIKE BOILER INSPECTOR.

4.5.2

IN CASE ANY MALFUNCTIONING AND / OR DEFECTS ARE FOUND DURING TESTS, TRIAL RUNS SUCH AS LOOSE COMPONENTS, UNDUE NOISE OR VIBRATION, STRAIN ON CONNECTED EQUIPMENTS ETC., THE CONTRACTOR SHALL IMMEDIATELY ATTEND TO THESE DEFECTS / MALFUNCTIONS AND TAKE NECESSARY CORRECTIVE MEASURES. IF ANY READJUSTMENT AND REALIGNMENT ARE NECESSARY, THE SAME SHALL BE DONE AS PER BHEL ENGINEER'S INSTRUCTIONS.

4.5.3

DURING EACH STAGE OF COMMISSIONING, IF ANY PART OF THE PIPING NEEDS REPAIR / RECTIFICATION / RE-WORK / REPLACEMENT, THE SAME SHALL BE DONE EXPEDITIOUSLY AND PROMPTLY BY THE CONTRACTOR. CONTRACTOR'S CLAIM, IF ANY, FOR SUCH REPAIR / RECTIFICATION /

REWORK / REPLACEMENT, ETC., FOR REASONS NOT ATTRIBUTABLE TO CONTRACTOR WILL BE GOVERNED BY CLAUSE 13.1. TO 13.8 OF SPECIAL CONDITIONS OF CONTRACT . THE PARTS TO BE REPLACED SHALL HOWEVER BE PROVIDED BY BHEL FREE OF COST.

4.5.4

THE TESTING AND PRE-COMMISSIONING ACTIVITIES WILL START AT APPROPRIATE STAGE OF READINESS OF EQUIPMENTS/ SYSTEMS AS AND/OR AS DECIDED BY BHEL ENGINEER. VARIOUS TESTING, TRIALS, AND PRE-COMMISSIONING ACTIVITIES SHALL CONTINUE TILL THE UNIT IS HANDED OVER. SIMULTANEOUS COMMISSIONING CHECKS, ACTIVITIES WILL BE IN PROGRESS IN VARIOUS AREAS LIKE TRIAL RUN OF VARIOUS EQUIPMENT, CHECKING OF EQUIPMENT ERECTED, MAKING READY FOR TRIAL RUNS, FILLING UP OF LUBRICANTS, CHEMICALS ETC., ALL THESE WORKS NEED SPECIALIZED GANGS INCLUDING ELECTRICIANS IN EACH AREA TO RENDER ASSISTANCE TO BHEL COMMISSIONING STAFF. CONTRACTOR SHALL EARMARK SEPARATE MANPOWER FOR VARIOUS PRE-COMMISSIONING AND COMMISSIONING ACTIVITIES. THIS MANPOWER SHALL NOT BE DISTURBED OR DIVERTED. THE MOBILIZATION OF THESE COMMISSIONING GANGS SHALL BE SUFFICIENT SO THAT PLANNED COMMISSIONING ACTIVITIES ARE TAKEN UP IN TIME AND ALSO COMPLETED AS PER SCHEDULE AND THE WORK UNDERTAKEN ROUND THE CLOCK IF REQUIRED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DISCUSS ON DAY TO DAY / WEEKLY / MONTHLY BASIS THE REQUIREMENT OF MANPOWER, CONSUMABLES, TOOLS AND TACKLES WITH BHEL ENGINEER AND ARRANGE FOR THE SAME. IF ANY TIME THE REQUISITE MANPOWER, CONSUMABLES, T&P ARE NOT ARRANGED THEN BHEL SHALL MAKE ALTERNATE ARRANGEMENTS AND NECESSARY RECOVERIES WILL BE MADE ALONG WITH OVERHEAD CHARGES OF BHEL.

4.5.5

CONTRACTOR SHALL CUT OPEN WORKS IF NEEDED AS PER BHEL ENGINEER'S INSTRUCTIONS DURING COMMISSIONING FOR INSPECTION, CHECKING AND MAKE GOOD THE WORKS AFTER INSPECTION IS OVER WITHOUT ANY EXTRA PAYMENT.

4.5.6.

COMMISSIONING ACTIVITIES WILL CONTINUE TILL THE COMPLETION OF TRIAL OPERATION & HANDING OVER AND COMPLETION OF ALL FACILITIES. 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.

4.5.7

IT SHALL BE SPECIFICALLY NOTED THAT ABOVE EMPLOYEES OF THE CONTRACTOR MAY HAVE TO WORK ROUND THE CLOCK ALONGWITH BHEL COMMISSIONING ENGINEERS INVOLVING CONSIDERABLE PAYMENT OF OVERTIME.

4.5.8

DURING COMMISSIONING, OPENING OF VALVES, CHANGING OF GASKETS, CHECKING, RESETTING OF HANGERS, REALIGNING OF ROTATING AND OTHER EQUIPMENT, ATTENDING TO LEAKAGES IN VALVES ETC., AND ADJUSTMENTS OF ERECTED EQUIPMENT MAY ARISE. ALL THE VALVES SHALL BE SERVICED AND LUBRICATED TO THE SATISFACTION OF BHEL ENGINEER DURING THE ERECTION AND COMMISSIONING AS PER BHEL ENGINEER'S INSTRUCTIONS.

4.5.9

IN CASE ANY RE-WORK / REPAIR / RECTIFICATION / MODIFICATION / FABRICATION, ETC., IS REQUIRED BECAUSE OF CONTRACTOR'S FAULTY ERECTION WHICH IS NOTICED DURING COMMISSIONING OF AT ANY STAGE, THE SAME HAS TO BE RECTIFIED BY THE CONTRACTOR AT HIS COST. IF DURING COMMISSIONING, ANY IMPROVEMENT/ REPAIR/RE-WORK/ RECTIFICATION/ FABRICATION / MODIFICATION DUE TO DESIGN IMPROVEMENT / REQUIREMENT IS INVOLVED, THE SAME SHALL BE CARRIED OUT BY CONTRACTOR PROMPTLY AND EXPEDITIOUSLY. CLAIMS, IF ANY, FOR SUCH WORKS FROM THE CONTRACTOR SHALL BE GOVERNED BY CLAUSE 13.1.TO 13.8.

4.5.10

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE FOR NECESSARY LABOUR, TOOLS AND TACKLES AND CONSUMABLES TILL THE COMPLETION OF WORK UNDER THESE SPECIFICATION, EVEN IN CASE ERECTION, TESTING AND COMMISSIONING OF THE PIPING AND OTHER EQUIPMENTS ARE DELAYED DUE TO REASONS NOT ATTRIBUTABLE TO THE CONTRACTOR.

4.5.11

CONTRACTOR SHOULD SPECIFICALLY HAVE ELECTRICAL AND MECHANICAL TECHNICIANS FOR SERVICING AND MAINTENANCE OF VALVES, ACTUATORS AND STRAINERS. THE TECHNICIANS SHOULD HAVE THE EXPERTISE IN DISMANTLING THE VALVES, RE-ASSEMBLY AND ALSO ATTENDING TO THE PROBLEMS.

4.5.12

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 SYSTEM 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 AND OTHER COMMISSIONING ACTIVITIES (e.g. FLUSHING, STEAM BLOWING etc.) OF VARIOUS SYSTEMS & PIPING. SIMILARLY NO PAYMENT WILL BE MADE FOR ELECTRICAL INSTALLATIONS MADE FOR ANY TEMPORARY SYSTEM.

4.5.13

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 EQUIPMENTS.

4.5.14

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.

4.5.15

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.

4.6 INSTALLATION OF VIBRATION ISOLATION SYSTEM:

Technical details and quantitative information will be furnished through a Corrigendum later on but well before tender submission.

4.7 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

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

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

- a) ONLY OPEN SPACE FOR CONSTRUCTION OF LABOUR WILL BE PROVIDED BY THE CLIENT. DEVELOPMENT OF THE LAND AND COSTRUCTION OF LABOUR COLONY, WITH ARRANGEMENTS OF LIGHTING, DRINKING WATER, AND SANITATION ETC IS IN CONTRACTOR'S SCOPE.
- b) ELECTRICTY FOR LABUOR COLONY: CONTRACTOR SHALL MAKE HIS OWN ARRANGEMENT FOR DRAWING AND FURTHER DISTRIBUTION CONFORMING TO THE STATUTORY & SAFETY REQUIREMENTS.
- c) FOR DRINKING WATER CONTRACTOR HAS TO MAKE HIS OWN ARRANGEMENT INCLUDING DIGGING OF BORE-WELL IF REQUIRED.
- d) THE CONTRACTOR HAS TO MAKE HIS OWN ARRANGEMENT FOR TRANSPORTATION OF HIS WORKMEN AND OTHER EMPLOYEES. BHEL/CLIENT SHALL NOT PROVIDE ANY FACILITY IN THIS REGARD.

5.2 TOOLS AND TACKLES, MEASURING AND MONITORING DEVICES:

5.2.1

THE CONTRACTOR SHALL PROVIDE ALL EXCEPTING THOSE SPECIFICALLY INDICATED AS 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/ UNLOADING BAY FOR RAIL CONSIGNMENT. BHEL'S CRANE WILL NOT BE AVAILABLE FOR THIS PURPOSE. PLEASE REFER APPENDIX-III FOR THE LIST OF T&P BEING PROVIDED BY BHEL FREEE OF CHARGES ON SHARING BASIS.

5.2.2

NOT USED

5.2.3

BHEL WILL PROVIDE ON SHARING BASIS ITS CRAWLER CRANE AS LISTED IN RELEVANT APPENDIX FOR LIFTING THE COMPONENTS OF FST AND DEAEERATOR TO THE NEAREST POSSIBLE ELEVATION/ FLOOR. THE CONTRACTOR SHALL MAKE COMPLETE ARRANGEMENT FOR FURTHER DRAGGING AND ERECTION OF THESE ITEMS UP TO THEIR FINAL POSITION. ANY BOOM REDUCTION, EXTENSION FOR THEIR USE AND RESTORATION TO PREVIOUS STATE OR AS DIRECTED BY BHEL AFTER THE USE SHALL BE THE CONTRACTOR'S RESPONSIBILITY.

5.2.4

CONTRACTOR SHALL PROVIDE SUITABLE CRANES WITH OPERATORS AND FUEL FOR MATERIAL HANDLING AT BHEL/CLIENT'S STORES/STORAGE YARDS AS WELL AS AT SITE OF WORK.

5.2.5

CONTRACTOR SHALL BEAR THE OPERATION CHARGES (OPERATOR, FUEL ETC.) OF THE BHEL CRAWLER CRANE ISSUED FOR LIFTING DEAEERATOR AND FST SHELL COMPONENTS, AS PER BHEL ENGINEER'S DECISION.

5.2.6

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.

5.2.7

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

5.2.8

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.

5.2.9

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

5.2.10

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

5.2.11

THE T&P TO BE ARRANGED BY THE CONTRACTOR SHALL BE IN PROPER WORKING CONDITION AND THEIR OPERATION SHALL NOT LEAD TO UNSAFE CONDITION. CONTRACTOR SHALL OBTAIN PRIOR APPROVAL OF BHEL FOR ALL THE T&P BEFORE DEPLOYING IN ACTUAL WORK. THE MOVEMENT OF CRANES, AND OTHER EQUIPMENT SHOULD BE SUCH THAT NO DAMAGE / BREAKAGE OCCURS TO FOUNDATIONS, OTHER EQUIPMENTS, MATERIAL, PROPERTY AND MEN. ALL ARRANGEMENTS FOR THE MOVEMENT OF THE T&P ETC SHALL BE THE CONTRACTOR'S RESPONSIBILITY.

5.2.12

NORMALLY, USE OF 3 PHASE WELDING GENERATORS ONLY IS PERMITTED FOR WELDING. THE USE OF WELDING TRANSFORMERS WILL BE SUBJECT TO PRIOR APPROVAL OF BHEL.

5.2.13

THE CONTRACTOR AT HIS COST SHALL CARRY OUT PERIODICAL TESTING OF HIS CONSTRUCTION EQUIPMENTS AND CALIBRATION OF MEASURING & MONITORING DEVICES (MMD). TEST / CALIBRATION CERTIFICATES SHALL BE FURNISHED TO BHEL. MMD SHALL BE CALIBRATED ONLY AT ACCREDITED LABORATORY AS PER THE LIST AVAILABLE WITH BHEL OR ANY OTHER LABORATORY APPROVED BY BHEL. ALL CALIBRATION SHALL BE TRACEABLE TO NATIONAL OR INTERNATIONAL STANDARDS.

5.3 CONSUMABLES

5.3.1

THE CONTRACTOR SHALL PROVIDE ALL CONSUMABLES REQUIRED FOR CARRYING OUT THE WORK COVERED UNDER THESE SPECIFICATIONS EXCEPTING THOSE WHICH ARE SPECIFICALLY INDICATED AS BHEL SCOPE.

5.3.2

ALL CONSUMABLES TO BE USED FOR THE WORK SHALL HAVE PRIOR APPROVAL OF BHEL ENGINEER WITH REGARD TO BRAND AND QUALITY SPECIFICATIONS. TEST REPORTS / CERTIFICATES IN

RESPECT OF THESE CONSUMABLES, WHEREVER APPLICABLE, SHALL BE SUBMITTED TO BHEL ENGINEER.

5.3.3 PRIMERS & PAINTS

BHEL WILL PROVIDE PAINT & PRIMER FOR ONLY THE SPECIFIED AREAS HEREIN, ALL OTHER REQUIREMENTS ARE IN CONTRACTOR'S SCOPE.

5.4 WELDING ELECTRODES, FILLER WIRES FOR TIG WELDING AND GASES

5.4.1

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

5.4.2

GASES LIKE ARGON, OXYGEN, AND ACETYLENE ETC THAT ARE REQUIRED FOR ERECTION RELATED ACTIVITIES SHALL BE ARRANGED BY THE CONTRACTOR AT HIS COST. ARGON GAS FOR P-91 PIPE JOINTS WELDING PROCESS SHALL BE CONFORMING TO GRADE-3 OF IS:5760-1998 WITH OXYGEN AND WATER VAPOUR RESTRICTED TO MAXIMUM 6 PPM EACH AND WITH ARGON PURITY LEVEL OF MINIMUM 99.99%. THE SUPPLY SHOULD ACCOMPANY TEST CERTIFICATE FOR THE BATCH INDICATING INDIVIDUAL ELEMENT 'PPM' LEVEL AND OVERALL PURITY LEVEL.

5.4.3

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

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

5.5 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 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.

5.5.3.

BHEL IS INSTALLING A COMPUTERIZED SITE MANAGEMENT SYSTEM AT SITE TO COVER AREAS OF MATERIAL MANAGEMENT, ERECTION & COMMISSIONING, QUALITY CONTROL, BILLING, MIRS, ETC. THIS SYSEM CAN BE ACCESSED THROUGH NORMAL TELEPHONE LINES AND THROUGH LAN INSTALLED AT SITE.

CONTRACTOR SHALL ENSURE THAT ALL OPERATIONS IN THEIR SCOPE WHICH HAVE INTERFACES WITH BHEL SYSTEM IS DONE ONLY THROUGH THIS COMPUTERIZED SYSTEM. CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR CONNECTIVITY, COMPUTING EQUIPMENT, PERSONNEL, SOFTWARE, ETC TO OPERATATE AND INTERACT WITH BHEL SYSTEM. NO MANUAL SYSTEM OTHER THEN WHAT IS NOT COVERED BY COMPUTREIZED SYSTEM WILL BE ACCEPTABLE TO BHEL.

5.6 AREA LIGHTING

5.6.1

CONTRACTOR SHALL ARRANGE ADEQUATE FLOODLIGHTS, HAND LAMPS AND AREA LIGHTING. CONTRACTOR SHALL USE HIS OWN MATERIALS LIKE CABLES, FUSES, SWITCH BOARDS ETC.

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 APPROXIMATLY 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 COMPLETETION 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.

5.8.4.

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

5.8.5 CERTAIN IMPORTANT MATTERS REGARDING IR AT SITE

A) CONTRACTOR SHALL OBTAIN FORM V FROM THE CLIENT IMMEDIATELY ON REACHING SITE.

B) CONTRACTOR SHALL OBTAIN NECESSARY LABOUR LICENSE WITHIN 30 DAYS FROM THE START OF WORK. THE NUMBER OF PERSONS COVERED BY THE LICENSE SHOULD BE INCREASED AS AND WHEN THE LABOUR STRENGTH IS INCREASED AT SITE.

C) THE COVERAGE OF WORKMEN COMPENSATION INSURANCE SHALL ALSO BE COMMENSURATE WITH THE ACTUAL STRENGTH OF WORKFORCE.

D) CONTRACTOR SHALL DEPOSIT APPLICABLE AMOUNT TOWARDS PROVIDENT FUND FOR ALL THE LABOUR EMPLOYED BY HIM WITH REQUISITE AUTHORITY AND FURNISH THE COPY OF CHALLAN TO BHEL EVERYMONTH AND SUBMIT ANNUAL RETURN FORMS 3A & 6A (AND/OR ANY OTHER APPLICABLE FORMS). AS FAR AS POSSIBLE, CONTRACTOR SHALL OBTAIN PF STATEMENT IN RESPECT OF EACH WORKER AND DISTRIBUTE TO THE INDIVIDUALS.

E) CONTRACTOR'S MONTHLY INVOICES WILL BE CLEARED SUBJECT TO SUBMISSION OF NECESSARY DOCUMENTS INCLUDING STATUTORY ONES SUCH AS PF CHALLANS, WAGE SHEETS ETC. THIS IS TO BE NOTED SPECIFICALLY AS ESSENTIAL FROM THE POINT OF VIEW THAT BHEL'S OWN INVOICES ON CLIENT WILL BE RELEASED ONLY ON SUBMISSION OF DOCUMENTS SUCH AS ABOVE STATED.

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 THEREBY 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 AS 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

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 CONTRACTOR DURING HIS USE. SPARES IF ANY, REQUIRED IN NORMAL COURSE WILL BE PROVIDED & MAJOR BREAKDOWNS WILL BE ATTENDED TO BY THE AGENCY OF BHEL. 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.

7.3.1.5

- A. CONTRACTOR SHALL PROVIDE THE FUEL FOR HIS USE FOR THE CRANES PROVIDED BY BHEL.
- B. CONTRACTOR SHALL BEAR THE COST OF THE CRANE OPERATOR BEING PROVIDED BY THE OTHER AGENCY OF BHEL TO WHICH THE CRANE IS ISSUED ORIGINALLY.

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

8.0 Inspection/Quality Assurance/Quality Control/ Statutory Inspection

- 8.1 Various inspection/quality control/quality assurance procedures/methods at various stages of erection and commissioning will be as per BHEL/customer quality control procedure/codes and other statutory provisions and as per BHEL engineer's instructions.
- 8.2 Preparation of quality assurance log sheets and protocols with customer/consultants/statutory authority, welding logs, NDE records, testing & calibration records and other quality control and quality assurance documentation as per BHEL engineer's instructions, is within the scope of work/specification. These records shall be submitted to BHEL/customer for approval from time to time.
- 8.3 A daily logbook of all measurements and testing/calibration should be maintained by contractor on the job for detailing inspection details of various equipments.
- 8.4 The performance of welders will be reviewed from time to time as per the BHEL standards. Welders' performance record shall be furnished periodically. Corrective action as informed by BHEL shall be taken in respect of those welders not conforming to these standards. This may include removal/ discontinuance of concerned welder(s). Contractor shall arrange for the alternate welders immediately.
- 8.5 All the welders shall carry identity cards as per the proforma prescribed by BHEL only welders duly authorized by BHEL/customer/consultant shall be engaged on the work.
- 8.6 Contractor shall provide all the measuring monitoring devices (MMDs) required for completion of the work satisfactorily. These MMDs shall conform to job requirement in respect of measurement range, accuracy level & any other specification. The indicative list of MMDs required for this work and to be made available by the contractor is given in appendix-III. The list will be reviewed by BHEL and the contractor shall meet any augmentation needed.
- 8.7 The MMDs deployed by the contractor shall, at all stages of work, have valid and current calibration. BHEL shall be done the calibration of these MMDs from the agencies accredited/ approved. Copy of calibration certificates in respect of these MMDs has to be submitted to BHEL. Periodical status report regarding validity of calibration has to be submitted to BHEL. Re-calibration/ re-validation shall be done periodically as per BHEL specifications. Contractor shall conform to the specifications of BHEL regarding storage of the MMDs.
- 8.8 Re-work necessitated on account of use of invalid MMDs shall be entirely to the contractor's account. He shall be responsible to take all corrective actions, including resource augmentation if any, as specified by BHEL to make-up for the loss of time.
- 8.9 In the course of work BHEL may counter/ finally check the measurements with their own MMDs. Contractor shall render all assistance in conduct of such counter/final measurements.

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

8.11 Stage Inspection By FES/QA Engineers

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

8.12 Statutory Inspection of Work:

8.13 Statutory Inspection of Work

8.13.1

The work to be executed under these specifications has to be offered for inspection, at appropriate stages of work completion, to various statutory authorities for compliance with applicable regulations.

8.13.2

The work related statutory inspections, though not limited to, are as under:

- 1) Inspectorate of the Chief Electrical Inspector of Madhya Pradesh OR Central Electricity Authority as per statute.
- 2) Any other authority connected to this work.

The scope includes getting the approval of the installations from the statutory authorities, which includes arranging for inspection visits of statutory authority periodically as per BHEL engineer's instructions, submitting documents, radiographs etc. and following up the matter with them. Contractor shall also make all arrangements for offering the products/systems for inspection, as applicable, to the concerned authority.

8.13.3

It shall be contractor's responsibility to obtain approval of statutory authorities, whenever applicable, for conducting any work which comes under the purview of these authorities.

8.13.4

BHEL will pay fees for visits, inspection fees etc. of these statutory authorities. Please refer Section-5 for working arrangement for payment of fees in this regard. All other expenses shall be borne by the contractor. In case these inspections have to be repeated due to reasons attributable to the contractor and fees have to be paid again, the contractor has to pay such additional charges.

8.13.5

It shall be the responsibility of contractor to obtain license from chief electrical inspector, Maharashtra for carrying out high voltage work. Contractor shall also comply with the provisions of the latest Electricity Act, including the amendments thereof.

8.13.6

The contractors shall pay all fees connected with testing of his welders/workers and testing, inspection & calibration of his MMD and T&P.

8.14.0

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

8.15.0 Field Quality Assurance

Contractor shall carry out all activities conforming to the approved Field Quality Plan (FQP) as revised from time to time. Total quality shall be the watchword of the work and contractor shall strive to achieve the quality standards, procedures laid down by BHEL. He shall follow all the instructions as per BHEL drawings and quality standards. Contractor shall provide the services of quality assurance engineer as per the relevant clauses.

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 endeavor of BHEL and all its subcontractors to meet and implement the requirements by following the guidelines issued under Environmental, Occupational Health and Safety Management (EHS) manual a copy of which will be available with the BHEL Site-in-charge.

Contractor shall also enter into a "Memorandum of Understanding" as given in clause 9.9 in case of award of contract.

9.0 Responsibility of the Contractor in Respect of Safety of Men, Equipment, Material and Environment.

9.1 The Contractor shall:

9.1.1

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

9.1.2

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

9.1.3

Abide by the Procedure governing entry/exit of the contractor's personnel within the Customer/Client premises. All the contractors employees shall be permitted to enter only on displaying of authorized Photo passes or any other documents as authorized by the Customer/Client.

9.1.4

Be fully responsible for the identity, conduct and integrity of the personnel/workers engaged by them for carrying out the contract work and ensure that none of them are ever engaged in any anti national activity

9.1.5

Prepare a signboard giving the following information and display it near work site:

- i) Name of Contractor
- ii) Name of Contractor Site-in-charge & Telephone number
- iii) Job Description in short
- iv) Date of start of job
- v) Date of expected completion
- vi) Name of BHEL Site-in-charge.

9.1.6

Abide by the rules and regulations existing during the contract period as applicable for the contractors at the Project premises.

9.1.7

Observe the timings of work as advised by BHEL Engineer-in-charge for carrying out the contract work.

9.2 **SPECIAL CONDITIONS**

9.2.1 **Safety**

9.2.1.1 **Safety Plan**

Before commencing the work, contractor shall submit a “safety plan” to the authorized BHEL official. The safety plan shall indicate in detail the measures that would be taken by the contractor to ensure safety to men, equipment, material and environment during execution of the work. The plan shall take care to satisfy all requirements specified hereunder.

The contractor shall submit “safety plan” before start of work. During negotiations, before placing of work order and during execution of the contract, BHEL shall have right to review and suggest modifications in the safety plan. Contractor shall abide by BHEL's decision in this respect.

9.2.1.2

The contractor shall take all necessary safety precautions and arrange for appropriate appliances and/or as per direction of BHEL or it's authorized person to prevent loss of human lives, injuries to men engaged and damage to property and environment.

9.2.1.3

The contractor shall provide to his work force and also ensure the use of Personnel Protection Equipment (PPE) as found necessary and/or as directed and advised by BHEL officials without which permission is liable to be denied.

- Safety helmets conforming to IS 2925/1984 (1990)
- Safety belts conforming to IS 3521/1989
- Safety shoes conforming to IS 1989 part-II /1986(1992)
- Eye and face protection devices conforming to IS 2573/1986(1991), IS 6994 (1973), part-I (1991), IS 8807/1978 (1991), IS 8519/1977(1991).
- Other job specific PPEs of standard ISI make as may be prescribed

9.2.1.4

All tools, tackles, lifting appliances, material handling equipment, scaffolds, cradles, cages, safety nets, ladders, equipment, etc used by the contractor shall be of safe design and construction. These shall be tested and certificate of fitness obtained before putting them to use and from time to time as instructed by authorized BHEL official who shall have the right to ban the use of any item found to be unsafe.

9.2.1.5

All electrical equipment, connections and wiring for construction power, its distribution and use shall conform to the requirements of Indian Electricity Act and Rules. Only electricians licensed by the appropriate statutory authority shall be employed by the contractor to carryout all types of electrical works. All electrical appliances including portable electric tools used by the contractor shall have safe plugging system to source of power and be appropriately earthed.

9.2.1.6

The contractor shall not use any hand lamp energized by electric power with supply voltage of more than 24 volts. For work in confined spaces, lighting shall be arranged with power source of not more than 24 volts.

9.2.1.7

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

9.2.1.8

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

9.2.1.9

Proper means of access must be used e.g. ladders, scaffolds, platforms etc. No makeshift access such as oil drums or pallets shall be used. Design of these will be in accordance with relevant standards and certified by competent persons before use.

9.2.1.10

Temporary arrangements made at Site for lifting , platforms, approach access etc should be properly designed and approved before being put to use.

9.2.1.11

All excavations and openings must be securely and adequately fenced/barricaded and warning signs erected when considered necessary as per relevant code of practice.

9.2.1.12

No persons shall remove guardrails, covers or protective devices unless authorized by a responsible supervisor and alternative precautions have been taken

9.2.1.13

Access ways, means of escape and fire exits shall be clearly marked, kept clear and unobstructed at all times

9.2.1.14

Only authorized persons holding relevant license will drive and operate site plant and equipments e.g. cranes, dumpers, excavators, transport vehicles etc

9.2.1.15

Only authorized personnel are allowed to repair, commission electrical equipments.

9.2.1.16

Gas Cylinders shall be handled and stored as per Gas Cylinders Rules and relevant safe working practices

9.2.1.17

All wastes generated at Site shall be segregated and collected in a designated place so as to prevent spillage/contamination/scattering at Site, until the waste is lifted for disposal to designated disposal area as advised by BHEL official.

9.2.1.18

The contractor shall arrange at his cost (wherever not specified) appropriate illumination at all work spots for safe working when natural day light is not adequate for clear visibility.

9.2.1.19

The contractor shall train adequate number of workers/supervisors for administering "FIRST AID". List of competent first aid 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 absenting himself from work for more than 46 hours, his accident report has to be sent to the respective Government Authorities. Therefore contractor shall inform the owner's representative such matter immediately for their needful action.

9.5.5

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

9.5.6

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

9.6 AUDIT REVIEW AND INSPECTION

9.6.1

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

9.6.2

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

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

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

The contractor shall take remedial measures as per the findings of each inspection
Besides the above, the contractor shall be required to carry out the following inspections

Sl no	Equipment	Scope of inspection	Inspection by	Schedule
1	Hand tools	To identify unsafe/defective tool	User	Daily
2	Power tools	To identify unsafe/defective tool	User	Daily
3	Fire Extinguishers	To check pressure and any defect	User / Safety Coordinator	Daily Every month
4	Lifting equipment/tackles	To check for defects and efficacy of brakes	User Third party	Daily Every Year
5	PPE	To check for defects	User	Daily

9.7 **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 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:

4 Memorandum of Understanding

is committed to Health, Safety and Environment Policy (EHS Policy) as given in the booklet titled “ Safe Working Practices” issued to all contractors.

M/s _____ do hereby also commit to the same EHS Policy while executing the Contract Number _____

M/s _____ shall ensure that safe work practices not limited to the above booklet are followed by all construction workers and supervisors. Spirit and content therein shall be reached to all workers and supervisors for compliance.

BHEL will be carrying out EHS audits twice a year and M/s _____ shall ensure to close any non-conformity observed/reported within fifteen days.

Signed by authorized representative of M/s-----

Name :

Place & Date:

9.10

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

IS No	YEAR	Amd upto	DESCRIPTION
IS 10204	1982		PORTABLE FIRE EXTINGUISHERS MECHANICAL FOAM TYPE
IS 10245	1994		SPECIFICATION FOR BREATHING APPARATUS
IS 10291	1982		SAFETY CODE FOR DRESS DRIVERS IN CIVIL ENGINEERING WORKS
IS 10658	1983		HIGHER CAPACITY DRY POWDER FIRE EXTINGUISHERS (TROLLEY MOUNTED)
IS 10662	1992		COLOUR TELEVISION
IS 10667	1983		GUIDE FOR SELECTION OF INDUSTRIAL SAFETY EQUIPMENT FOR PROTECTION OF FOOT AND LEG
IS 11037	1984		ELECTRONIC FAN REGULATORS
IS 11057	1984		INDUSTRIAL SAFETY NETS
IS 11451	1998		RECOMMENDATION FOR SAFETY AND HEALTH REQUIREMENT RELATING TO OCCUPATION EXPOSURE TO ASBESTOS
IS 1169	1967		PEDESTAL FANS
IS 1179	1967		SPECIFICATION FOR EQUIPMENT FOR EYE AND FACE PROTECTION DURING WELDING
IS 11833	1986		DRY POWDER FIRE EXTINGUISHERS FOR METAL FIRES
IS 11972	1987		CODE OF PRACTICE FOR SAFETY PRECAUTION TO BE TAKEN WHEN ENTERING A 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

IS No	YEAR	Amd upto	DESCRIPTION
			CONSTRUCTION AND ALTERATION TO EXISTING BUILDINGS
IS 13849	1993		PORTABLE FIRE EXTINGUISHERS DRY POWDER TYPE (CONSTANT PRESSURE)
IS 1446	1985		CLASSIFICATION OF DANGEROUS GOODS (FIRST REVISION)
IS 1476	1979		REFRIGERATORS
IS 1641	1988		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS (GENERAL): GENERAL PRINCIPLES OF FIRE GRADING AND CLASSIFICATION
IS 1642	1989		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS- DETAILS OF CONSTRUCTION
IS 1643	1988		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS (GENERAL): EXPOSURE HAZARD
IS 1646	1997		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS (GENERAL): ELECTRICAL INSTALLATIONS
IS 1904	1986		CODE OF PRACTICE FOR DESIGN AND CONSTRUCTION OF FOUNDATIONS IN SOIL
IS 1905	1987		STRUCTURAL SAFETY OF BUILDINGS MASONARY WALLS
IS 2082	1985		ELECTRICAL GEYSERS
IS 2171	1985		PORTABLE FIRE EXTINGUISHERS DRY POWDER TYPE (CARTRIDGE)
IS 2309	1989		PRACTICE FOR THE PROTECTION OF BUILDINGS AND ALLIED BUILDINGS AGAINST LIGHTENING
IS 2312	1967		EXHAUST FANS
IS 2361	1994		SPECIFICATION FOR BUILDING GRIPS - FIRST REVISION
IS 2418	1977		TUBULAR FLUORSCENT LAMPS IS 2418 (FT-1)
IS 2750	1964		STEEL SCAFFOLDINGS
IS 2762	1964		SAFE WORKING LOADS IN KGS FOR WIRE ROPE SLINGS
IS 2878	1986		FIRE EXTINGUISHERS CARBON DIOXIDE TYPE (PORTABLE AND TROLLEY MOUNTED)
IS 2925	1984		SPECIFICATION FOR INDUSTRIAL SAFETY HELMETS
IS 3016	1982		CODE OF PRACTICE FOR FIRE PRECAUTIONS IN WELDING AND CUTTING OPERATIONS- FIRST REVISION
IS 3315	1974		DESERT COOLERS
IS 3521	1989		INDUSTRIAL SAFETY BELTS AND HARNESS
IS 368	1983		IMMERSION WATER HEATERS
IS 3696	1991		SAFETY CODE OF SCAFFOLDS AND LADDERS PART 1 TO 2
IS 3737	1996		LEATHER SAFETY BOOTS FOR WORKERS IN HEAVY METAL INDUSTRIES
IS 374	1979		CEILING FANS INCLUDING REGULATORS
IS 3764	1992		EXCAVATION WORK - CODE OF SAFETY
IS 3786	1983		METHOD FOR COMPUTATION OF FREQUENCY AND SEVERITY RATES FOR INDUSTRIAL INJURIES AND CLASSIFICATION OF INDUSTRIAL ACCIDENTS
IS 3935	1966		CODE OF PRACTICE FOR COMPOSITE CONSTRUCTION
IS 4014	1967		CODE OF PRACTICE FOR STEEL TUBULAR SCAFFOLDING
IS 4081	1986		SAFETY CODE FOR BLASTING AND RELATED DRILLING OPERATIONS
IS 4082	1977	1996	STACKING AND STORAGE OF CONSTRUCTION MATERIALS AND COMPONENTS AT SITE

IS No	YEAR	Amd upto	DESCRIPTION
IS 4130	1991		DEMOLITION OF BUILDINGS - CODE OF SAFETY PART 1 TO 2
IS 4138	1977		SAFETY CODE FOR WORKING IN COMPRESSED AIR (FIRST REVISION)
IS 4155	1966		GLOSSARY OF TERMS RELATING TO CHEMICAL AND RADIATION HAZARDS AND HAZARDOUS CHEMICALS
IS 4209	1967		CODE OF SAFETY FOR CHEMICAL LABORATORY
IS 4250	1980		FOOD MIXERS
IS 4262	1967		CODE OF SAFETY FOR SULFURIC ACID
IS 4756	1978		SAFETY CODE FOR TUNNELING WORK
IS 4912	1978		SAFETY REQUIREMENTS FOR FLOOR AND WALL OPENINGS, RAILINGS AND TOE BOARDS
IS 5121	1969		SAFETY CODE FOR PILING AND OTHER DEEP FOUNDATIONS
IS 5182	1969	1982	METHODS FOR MEASUREMENT OF AIR POLLUTION
IS 5184	1969		CODE OF SAFETY FOR HYDROFLUORIC ACID
IS 5216	1982	2000	RECOMMENDATIONS ON SAFETY PROCEDURES AND PRACTICE IN ELECTRICAL WORK PART I AND II
IS 555	1979		TABLE FANS
IS 5557	1995		INDUSTRIAL AND SAFETY LINED RUBBER BOOTS (SECOND REVISION)
IS 5916	1970		SAFETY CODE FOR CONSTRUCTION INVOLVING USE OF HOR BITUMINOUS MATERIALS
IS 5983	1980		SPECIFICATION FOR EYE PROTECTORS - FIRST REVISION
IS 6234	1986		PORTABLE FIRE EXTINGUISHERS WATER TYPE (STORED PRESSURE)
IS 692	1994		CRITERIA FOR SAFETY AND DESIGN OF STRUCTURES SUBJECTED TO UNDERGROUND BLASTS
IS 6994	1973		SPECIFICATION FOR SAFETY GLOVES
IS 7155	1986		CODE OF RECOMMENDED PRACTICE FOR CONVEYOR SAFETY (PART 1 TO 8)
IS 7205	1974		SAFETY CODE FOR ERECTION OF STRUCTURAL STEEL WORK
IS 7293	1974		SAFETY CODE FOR WORKING WITH CONSTRUCTION MACHINERY
IS 7323	1994		GUIDELINES FOR OPERATIONS OF RESERVOIRS
IS 7812	1975		CODE OF SAFETY FOR MERCURY
IS 7969	1975		SAFETY CODE FOR HANDLING AND STORAGE OF BUILDING MATERIALS
IS 8089	1976		CODE OF SAFE PRACTICE FOR LAYOUT OF OUTSIDE FACILITIES IN AN INDUSTRIAL PLANT
IS 8091	1976		CODE OF PRACTICE FOR INDUSTRIAL PLANT LAYOUT
IS 8095	1976		ACCIDENTS PREVENTION TAGS
IS 818	1968	1997	CODE OF PRACTICE FOR SAFETY AND HEALTH REQUIREMENTS IN ELECTRIC AND GAS WELDING, AND CUTTING OPERATIONS
IS 8448	1989		AUTOMATIC LINE VOLTAGE CORRECTOR (STABILISER)
IS 8519	1977		GUIDE FOR SELECTION OF INDUSTRIAL SAFETY EQUIPMENT FOR BODY PROTECTION
IS 8520	1977		GUIDE FOR SELECTION OF INDUSTRIAL SAFETY EQUIPMENT FOR EYE, FACE AND EAR PROTECTION

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

SECTION-10

SPECIAL CONDITIONS OF CONTRACT

10.0 DRAWINGS AND DOCUMENTS

10.1

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

10.2

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

10.3

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

10.4

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

10.5

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

10.6

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

10.7

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

10.8

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

SECTION-11
SPECIAL CONDITIONS OF CONTRACT

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

11.1 TIME SCHEDULE & MOBILIZATION

11.1.1 INITIAL MOBILIZATION AND TENTATIVE SCHEDULE

CONTRACTOR SHALL MOBILIZE HIS INITIAL RESOURCES SO AS TO START THE WORK WITHIN **TWO WEEKS** FROM THE DATE OF FAX LETTER OF INTENT/ AS PER THE ADVISE 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	ACTIVITY/MILESTONE	TENTATIVE COMPLN PERIOD FROM START OF WORK
01	BOILER LIGHT UP & ALKALI BOIL OUT COMPLETION	7 TH MONTH
02	STEAM BLOWING COMPLETION	10 TH MONTH
03	SYNCHRONIZATION & COAL FIRING	11 TH MONTH
04	COMPLETION OF TRIAL OPERATION OF UNIT	13 TH MONTH
05	COMPLETION OF FACILITIES	15 TH MONTH

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 15 (**FIFTEEN**) **MONTHS** FROM THE START OF CONTRACT PERIOD.

ERECTION OF THE FIRST MAJOR SUB-ASSEMBLY/MAIN ASSEMBLY OF ANY OTHER EQUIPMENT ON ITS DESIGNATED LOCATION FOLLOWING DUE PROCESS OF PRE-ASSEMBLY AND QUALITY CHECKS AS APPLICABLE & AS PER APPROVED FIELD QUALITY PLAN (FQP) SHALL BE RECKONED AS THE START OF CONTRACT PERIOD FOR THIS CONTRACT.

11.1.3 GRACE PERIOD

GRACE PERIOD OF 3 (THREE) MONTHS BEYOND THE CONTRACT PERIOD MAY BE PROVIDED FOR THIS CONTRACT AT THE DISCRETION OF BHEL.

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

11.3.1

The 85% component of the price quoted shall be permitted to be adjusted for variation in various relevant indices/prices during execution of work as per break-up given hereunder. The remaining 15% shall be treated as fixed component of price.

Sl No.	Category	Component ('K')	Base Index / Price	Base Date
A	Labourer of all categories	40%	Consumer price index for industrial workers (general), applicable to 'all India' as published by Labour Bureau, Shimla	Calendar month of the offer submission
B	H.S. Diesel	5%	Price of H.S. diesel oil at pump of IOCL/BPCL/HPCL nearest to the project site.	...do...
C	Welding Electrode	40%	Company's list price inclusive of excise but exclusive of sales tax & other duties/ levies/ taxes for E7018 electrode of M/s ESAB	...do...

11.3.2

Payment/recovery due to variation in index/prices shall be determined on the basis of the following notional formula without any initial absorption, in respect of the identified components viz. Labour, H.S. diesel oil and welding electrode.

$$A = K \times R \times \frac{(X_N - X_0)}{X_0}$$

Where,

A = amount to be paid/recovered due to variation in the index for labour, and prices for H.S. diesel oil, welding electrode

K = percentage component of labour, H.S. diesel oil & welding electrode as indicated in the column 3 above.

R = value of work done for the billing month.

X_N = revised index number for labour, and price for diesel oil
And welding electrode for the calendar month of billing period subsequent to the base date as indicated in the column no. 5 of the above table (i.e. for month under consideration)

X₀ = index no. For labour and prices for diesel oil and welding electrode as
On the base date indicated in the column no.5 of the above table.

The above formula is applicable for the entire contract period, grace period, and the extended contract period, if any. However, for the period extended on account of reasons attributable to the contractor and/or force majeure conditions the price variation will be applied based on the respective indices/prices frozen at levels applicable for the calendar month at the end of grace period.

No price variation shall be applicable to overrun charges, mayday rate for extra works etc.

PVC payment will be restricted up to 90% stage break up envisaged for pro-rata progressive payment of each item rate stipulated under Section-12. Special Conditions of Contract, Terms of Payment..

With the above provision, the clause no. 2.15 of general conditions of contract section-2 is not applicable.

11.3.3

The contractor shall furnish necessary 'price list' for H.S diesel and welding electrode and 'monthly bulletins' issued by labour bureau, Shimla. It is clarified that the price of H.S. diesel as applicable for the last date of billing period shall be considered for price variation purpose.

11.3.4

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

11.4 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.

11.11 INTEREST BEARING ADVANCE

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

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

11.12 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

12.1.1

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.

12.1.2

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

12.1.3

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.

12.1.4

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.

12.1.5

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

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

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

12.1 Stages of Progressive Pro-Rata Payments

12.1.1 For Pipes, Valves, Pre-fabricated Supports (Hangers & Supports)

30% of contract rate on pro rata basis after completion of erection.

40% of contract rate on pro rata basis on completion of alignment and welding/ bolting etc.

15% of contract rate on pro rata basis on completion of Radiography and Heat Treatment.

05% of contract rate on pro rata basis on completion of hydraulic test/ pressure decay test or any other test as applicable of concerned line.

02% of contract rate on pro rata basis on completion of permanent supports, cold-setting of hangers.

04% of contract rate on pro rata basis on completion Steam Blowing

02% of contract rate on pro rata basis on Synchronization of the unit..

02% of contract rate on pro rata basis after Hot Correction of Hangers and Acceptance on a Joint Protocol by BHEL and NTPC.

12.1.2 For Structural Supports, Site-Fabricated Supports, Tanks and Vessels:

45% of contract rate on pro rata basis after completion of erection

45% of contract rate on pro rata basis on completion of alignment, Bolting, Grouting/ welding

05% of the contract rate on pro rata basis on completion of Steam Blowing.

03% of contract rate on pro rata basis on Synchronization of the unit.

02% of contract rate on pro rata basis on completion of Trial Operation.

12.1.3 For VIS

100% of item rate on pro-rata basis on completion of work as per instructions of BHEL engineer.

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 Indian standards in this regard may be applied.
- B) Spares, surplus quantity, erection contingency materials will not be paid for unless the same has been consumed in place of regular item of measurable work as per the rate schedule.
- C) Where the payment is made on the basis of item rate, actual executed quantity measured jointly shall only be paid for.
- D) It is clarified that as far as weight constituted by welding consumables and other consumables supplied by BHEL as well as by the contractor, shall be ignored for the purpose payment.
- A) 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.
- B) Erection of Flow Nozzles, Flow Elements, Isolating Device etc. that are introduced after removing a part of the already erected pipeline, will be paid as per actual weight of these newly erected items. This will be in addition to the payment made for the portion being removed.

Section –13

Special Conditions of Contract

13.0 Extra Charges For Rectification And Modification

13.1

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

13.2

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

13.3

However, BHEL may consider for payment as extra, for such of those works detailed in clause 13.1 which require more than **100 man-hours** and such payment will be regulated by the terms, conditions and stipulations contained in the clauses 13.4 to 13.8 and/or 14.2.1 to 14.2.10 as the case may be. It may be specifically noted that the decision of BHEL as to whether such payment is due shall be final and binding on the contractor. It may also be noted that only those works, which are identified as major and warrant extra payment and certified as such by the site engineer and accepted by the designers and/or competent authority of BHEL, will be considered for extra payment.

13.4

For extra works arising out of transit, storage and erection damages, payment, if found due, will be regulated by clauses 14.2.1 to 14.2.10.

13.5

All the extra work should be carried out by a separately identifiable gang, without affecting routine activities. Daily log sheets in the pro-forma prescribed by BHEL should be maintained and shall be signed by the contractor's representative and BHEL engineer. No claim for extra work will be considered/entertained in the absence of the said supporting documents ie. Daily log sheets. It may, however be noted that signing of log sheets by BHEL engineer does not mean the acceptance of such works as extra works. All admissible claims shall be submitted to BHEL

13.6

BHEL retains the right to award or not to award any of the major repair/rework/modification/rectification/fabrication works under clauses 13.1 to 13.6 to the contractor, at their discretion without assigning any reason for the same.

13.7

Extra works that arise on account of contractor's fault will have to be carried out by the contractor free of cost including the supply of material and consumables

13.8

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

Man-day rate for eligible extra works :

Single average man-day rate, including overtime if any, and other site expenses and incidentals, including consumables, tools and tackles, for carrying out rework / repairs / rectification / modification / fabrication for a man-day of 8 hours as may arise during the course of erection will be **Rs. 320/- (Rupees Three Hundred twenty only)**

As mentioned above, no payment will be made if an item of work lasts less than 100 man-hours.

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

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:

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

EMD is to be paid in **cash** (as permissible under Income Tax Act), Pay order or **Demand Draft** in favour of Bharat Heavy Electricals Limited and payable at Nagpur opr Bank Guarantee in BHEL's prescribed format furnished in GCC.

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

- i) After opening the tender, the bidder revokes his tender within the validity period or increases his earlier quoted rates.
- ii) The bidder does not commence the work within the period as per LOI/Contract. In case the LOI / contract is silent in this regard then within 15 days after award of contract.

15.1.2 EMD shall not carry any interest.

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

15.2 Security Deposit

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

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

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

15.2.2 Security Deposit may be furnished in any one of the following forms

- i) Cash (as permissible under the Income Tax Act)
- ii) Pay Order, Demand Draft in favour of BHEL.
- iii) Local cheques of scheduled banks, subject to realization.
- iv) Securities available from Post Offices such as National Savings Certificates, Kisan Vikas Patras etc.
(Certificates should be held in the name of Contractor furnishing the security and duly pledged in favour of BHEL and discharged on the back).
- v) Bank Guarantee from Scheduled Banks / Public Financial Institutions as defined in the Companies Act subject to a **maximum of 50%** of the total security deposit value. The

balance SD has to be remitted either by cash or in the other forms of security. The Bank Guarantee format should have the approval of BHEL.

- vi) Fixed Deposit Receipt issued by Scheduled Banks / Public Financial Institutions as defined in the Companies Act. The FDR should be in the name of the contractor, A/C BHEL, duly discharged on the back.
- vii) Security deposit can also be recovered at the rate of 10% from the running bills. However in such cases at least 50% of the Security Deposit should be remitted (either by cash/DD or **BG for maximum 50%** of total SD) before start of the work and the balance 50% may be recovered from the running bills.
- viii) EMD of the successful bidder shall be converted and adjusted against the cash Security Deposit excepting for such bidder who has remitted One Time EMD.
- ix) The Security Deposit shall not carry any interest.

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

Security Deposit may be refunded to the contractor on his request but after completion of entire contractual scope of work duly certified by construction manager of BHEL. Alternately it will be released with final bill payment.

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

APPENDIX-I
TENTATIVE WEIGHT DETAILS

PCP			
SL NO	PGMA	DESCRIPTION	WT IN KGS
1	80301	MS FROM BOILER STOP VALVE TO ESV	105,915
3	80304	MS HEADER TO HPBP VALVE	20,532
2	80303	MS HEADER TO AUX PRDS	13,300
4	80310	HRH FROM REHEATER TO INTERCEPTOR VALVE	278,438
5	80311	HRH FROM INTERCEPTOR VALVE TO TURBINE	19,662
6	80312	LPBP VALVE UPSTREAM & DOWNSTREAM	107,863
8	80321	HPBP VALVE TO CRH PIPING	11,500
18	80812	H&S FOR AUXILIARY STEAM PIPING FOR LU	14,000
20	80830	H&S OF CRITICAL PIPING FOR SB - STEAM LINES	105,300
25	80934	HANGER COMPONENTS	11,833
19	80818	AUX STR OF AUXILIARY STEAM PIPING FOR LU	28,800
21	80840	AUX STR FOR MAIN STEAM PIPING FOR SB	220,000
7	80320	CRH FROM TURBINE TO REHEATER	127,757
9	80324	CRH HEADER TO AUX.PRDS	880
10	80340	AUX STEAM HEADER	4,700
11	80341	AUX STEAM HEADER INTERCONN BETWEEN UNITS	69,400
12	80352	AUX STEAM TO UNLISTED USERS - TG SCOPE	1,900
13	80373	AUX STEAM HEADER SV EXHAUST	4,300
15	80431	SPRAY WATER TO AUX PRDS	2,300
16	80452	HP PIPING DRAINS - SG SCOPE	10,700
17	80453	LP PIPING DRAINS - SG SCOPE	2,500
24	80906	BHEL VALVES FOR STEAM BLOWING	3,900
22	80901	SUB DELIVERY VALVES FOR LIGHT UP	6,500
23	80902	SUBDELIVERY VALVES FOR STEAM BLOWING	190

1,172,170

TG			
1	80307	HP & LP BYPASS WARM UP	1,600
2	80322	CRH PIPING TO DEAERATING HEATER	7,200
3	80323	STEAM TO BFP DRIVE TURBINE	2,600
4	80329	EXTRACTION STEAM TO BFP DRIVE TURBINE	7,600
5	80331	EXTRACTION STEAM TO LP HEATER-2	5,400
6	80332	EXTRACTION STEAM TO LP HEATER-3	3,800
7	80335	EXTRACTION STEAM TO DEAERATING HEATER	15,600
8	80336	EXTRACTION STEAM TO HP HEATER NO.1	6,000
9	80337	EXTRACTION STEAM TO HP HEATER-2	3,900
10	80339	AUX STEAM TO BFD TURBINE	1,600
11	80345	AUX STEAM TO DEAERATING HEATER	3,000
12	80349	AUX STEAM TO GLAND SEALS - TG SCOPE	1,500
13	80363	EXHAUST STEAM FROM PRIME MOVERS-TG SCOPE	22,700
14	80371	DRAIN FLASH TANK VENT TO CONDENSER	9,600
15	80375	UNLISTED SV EXHAUSTS - TG SCOPE	1,600
16	80379	HPH SV EXHAUST TO FLASH TANK	3,800
17	80381	HP HEATER VENTS - TG SCOPE	3,500
18	80382	LP HEATER VENTS	1,400
19	80385	VENT FROM UNLISTED PPG/EQPT TO COND	8,700

20	80388	CONDENSER AIR EVACUATION PIPING	3,100
21	80400	CONDENSATE SUCTION	5,900
22	80401	CD FROM PUMP TO LPH1/DC INLET TEE&RECIR	28,800
23	80402	CD FROM LPH1/DC INLET TEE TO TG TP	19,400
24	80403	CD FROM TG TP TO DEAERATING HEATER	9,700
25	80407	CONDENSATE FOR SEALING OF VACUUM	2,500
26	80408	CONDENSATE DUMP FROM HEADER	760
27	80412	CONDENSATE TRANSFER	1,560
28	80419	DEAERATOR SAFETY VALVE EXHAUST TO ATM	3,500
29	80420	BOILER FEED PUMP SUCTION	18,970
30	80421	BOILER FEED PUMP RECIRCULATION	22,810
31	80423	BOILER FEED PUMP TO HPH INCLUDING BYPASS	65,800
32	80424	BFD BETWEEN HTRS & GROUP PROTECTION VLV	23,950
33	80425	BFD FROM FINAL HPH TO SG TP	115,270
34	80430	SPRAY WATER TO HPBP	4,400
35	80432	SPRAY WATER TO BOILER DESH UPTO SG TP	16,900
36	80433	SPRAY WATER FROM BFP INTERSTAGE	4,300
37	80436	SPRAY WATER TO LPBP DESH	5,700
38	80439	TURBINE FLASH TANK DRAIN TO CONDENSER	670
39	80442	GLAND STEAM COOLER DRAINS	280
40	80443	LP HEATER-1 TO CONDENSER	3,800
41	80444	LP HEATER-2/3/4/5 DRAINS&DRIP PUMP INCL	6,400
42	80446	DEAERATING HEATER OVER FLOW AND DRAIN	4,400
43	80447	HP HEATER DRAINS	13,700
44	80448	DRAIN FROM UNLISTED EQPT/VESSEL-TG SCOPE	9,500
45	80449	TG CYCLE PIPING DRAINS & VENTS	3,100
46	80452	HP PIPING DRAINS - SG SCOPE	17,500
47	80453	LP PIPING DRAINS - SG SCOPE	8,000
48	80457	MANIFOLDS FOR HP FLASH BOX & CONDENSER	6,260
49	80459	HP FLASH TANK DRAIN TO CONDENSER	1,500
50	80463	TG AUX COOLING WATER	74,025
52	80473	DEMINERALISED WATER SYSTEM	5,700
53	80477	SERVICE WATER PIPING	3,900
54	80493	HP FLASH TANK VENT TO CONDENSER	3,100
55	80494	LP FLASH TANK VENT TO CONDENSER	2,700
56	80495	LP FLASH TANK DRAIN TO COND	2,100
57	80601	LOW PRESSURE DOSING PIPING	880
58	80610	SERVICE AIR-COMP SUCT & DIS TO RECEIVER	4,600
59	80614	INST AIR COMP SUC & DIS TO RECEIVER	4,500
61	80901	SUB DELIVERY VALVES FOR LIGHT UP	1,100
62	80928	H&S FOR BOILER LIGHT UP - TG	116,600
63	80930	H&S FOR SYNCHRONISATION - TG	31,100
64	80934	HANGER COMPONENTS	19,571

809,406

SG			
5	80355	STEAM TRACING PIPING	12,100
22	80812	H&S FOR AUXILIARY STEAM PIPING FOR LU	17,850
23	80814	H&S OF DRAINS AND VENTS FOR LU	25,300
24	80815	H&S FOR MISCELLANEOUS PIPING FOR LU	20,300
17	80460	SG AUX COOLING WATER UNIT SYSTEM	64,500
18	80480	FIRE WATER-OTHER AREAS	1,100
19	80600	HIGH PRESSURE DOSING PIPING	1,200
25	80818	AUX STR OF AUXILIARY STEAM PIPING FOR LU	53,300

26	80820	AUX STR OF DRAINS AND VENTS FOR LU	29,500
27	80821	AUX STR OF MISCELLANEOUS PIPING FOR LU	10,950
21	80650	FUEL OIL SUPPLY AND RETURN PIPING	58,200
20	80612	SERVICE AIR & INST.AIR FOR INDIVIDUAL UNITS	22,000
29	80905	BHEL VALVES FOR LIGHT UP	25,000
28	80901	SUB DELIVERY VALVES FOR LIGHT UP	8,050
33	81012	CLEAN DRAIN FLASH TANK - DIA 1500 MM	5,150
34	81018	MIXING TANK FOR CHEMICAL DOSING	550
35	81019	METERING TANK FOR CHEMICAL DOSING	550
36	81036	CW STORAGE TANK 16-25 CUM	6,800
37	81041	IMPURE CONDENSATE TANK	4,050
38	81042	MAKE UP WATER STORAGE TANK BELOW 300 CUM	7,950
39	81110	COOLING WATER PUMP	740
40	81120	HIGH PRESSURE DOSING PUMP	530
41	81161	BCW HEAT EXCHANGER	12,500
			388,170

NOTES:

1. BESIDES PRODUCT GROUPS INDICATED HEREIN, THERE IS LIKELIHOOD OF ADDITION OF NEW PRODUCT GROUPS BY BHEL' s UNIT FOR RELEASE OF SOME ITEMS, INTEGRAL TO THIS WORK. TENDERERS' QUOTED UNIT RATES SHALL BE APPLICABLE FOR SUCH PRODUCT GROUPS ALSO.
2. BHEL' s DECISION WITH REGARD TO CLASSIFICATION OF A PARTICULAR PRODUCT GROUP IS BINDING ON THE CONTRACTOR.

APPENDIX-III
LIST OF TOOLS & PLANTS TO BE PROVIDED BY THE BHEL FREE OF HIRE
CHARGES ON SHARABLE BASIS WITH OTHER AGENCIES

SL.NO.	DESCRIPTION OF T & P	QUANTITY
1	Induction Heating Equipment along with accessories as specified in relevant clause of Section-4, Special Conditions of Contract	2 Sets
2	EOT Crane in TG Hall 15/115 ton capacity	1 no.
3	Motorized hydro test pump 600 kg / cm ²	1 no
4	Motorized hydro test pump 450 kg / cm ²	1 no
5	.Acid Cleaning Circulation Pump with motor, starter etc – Installed by Boiler Ern agency to be used on sharing basis.	1 set
6	Crawler Crane 75 T/ 150-180 T class Crane	1 no.

NOTES:

THE ABOVE EQUIPMENT WILL BE PROVIDED ON SHARING BASIS FOR SPECIFIC ERECTION / COMMISSIONING ACTIVITIES WHERE IN THESE EQUIPMENT WILL BE REQUIRED. WHILE TAKING DELIVERY, CONTRACTOR SHALL CHECK FOR THE PROPER WORKING CONDITON SUBJECT TO NORMAL WEAR AND TEAR.

EOT CRANE WILL BE OPERATED BY TURBINE ERECTION AGENCY OF BHEL. PIPING CONTRACTOR SHALL SHARE THE OPERATING CHARGES AT THE MUTUALLY AGREED RATE IN PROPORTION TO THEIR RESPECTIVE USAGE.

APPENDIX-IV

LIST OF TOOLS & PLANTS AND MMDs TO BE DEPLOYED BY CONTRACTOR

A: TOOL & PLANTS

SN	DESCRIPTION OF EQUIPMENTS	CAPACITY	MIN. QTY
01	Suitable Cranes – Contractor shall arrange suitable crane(s) for loading of materials in BHEL's storage yards. This is also to be used in assembly of VIS.	As per requirement	1 no. to be deployed from the beginning
02	Winches etc	As per requirement	As per requirement
03	3-ph distributor board with complete set up for drawl of power for construction power.	600 Amp	2 Nos.
04	Electric cable & distribution of construction power.	-	As per requirement.
05	Annealing cable for heat treatment, beyond the BHEL scope of T & P for this purpose - refer Section-4 185 sq mm special connecting cable for connecting capacitor panel to junction and 240 sq mm 200 A & 3 KHz special annealing cable for winding on the joints	1200A & 3KHz	As per requirement
05	Recordable Ultra sonic Test Equipment T (UFD KRAFT KAMMER MAKE USN50 or higher version to meet the requirements)	Recordable	1 No.
06	RADIOGRAPHY ARRANGEMENT INCLUDING SOURCE	IR 192/CO 60	1 SET
07	Diesel Power Generating Set	As per requirement	As per requirement
08	Truck/ Trailer with prime mover etc for transport of materials from storage and/ or pre-assy yard to work site	As per requirement	1 no.

B: MEASURING AND MONITORING DEVICES (MMD)

The contractor has to bring all the measuring equipments required for completing the job. The detailed requirement shall fulfill the requirement of work in line with Field Quality Plan and finalized in consultation with BHEL Site Engineer.

NOTE:

Above lists are not intended to be exhaustive. Contractor shall arrange other T&P and MMD required in addition to those provided by BHEL.

All the small Tools & Plants etc. have to be provided by the contractor.

APPENDIX-V

ANALYSIS OF UNIT RATE QUOTED

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

DATE
SIGNATURE OF THE BIDDER

APPENDIX-VI

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

Use additional sheet for remaining period

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

SIGNATURE OF BIDDER
DATE:

APPENDIX–VII

FORMAT FOR DEPLOYMENT PLAN FOR MAJOR TOOLS AND PLANTS

Use additional sheet for remaining period

SN	DESCRIPTION & CAPACITY OF T&P	MONTHS													
		1	2	3	4	5	6	7	8	9	10	11	12	13	So on
01															
02															
03															
04															
05															
06															
07															
08															
09															
10															

SIGNATURE OF THE BIDDER
DATE:

APPENDIX-VIII

CONCURRENT COMMITMENTS

SN	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 COMPLETION DATE	REMARKS

SIGNATURE OF THE BIDDER
DATE:

APPENDIX-IX

DETAILS OF SIMILAR WORK DONE DURING THE LAST SEVEN YEARS

SL. NO.	FULL POSTAL ADDRESS OF CLIENT & NAME OF OFFICER IN CHARGE	DESCRIPTION OF WORK	VALUE OF CONTRACT	DATE OF AWARD OF WORK	DATE OF COMMENCEMENT OF WORK	TIME SCHEDULE (MONTHS)	DATE OF ACTUAL COMPLETION OF WORK	REMARKS

SIGNATURE OF TENDERER WITH SEAL

PLEASE USE ADDITIONAL SHEET IF NEEDED **IN THE SAME FORMAT.**

PLEASE ENCLOSE COPIES OF WORK ORDERS INCLUDING DETAILED BILL OF QUANTITIES, COMPLETION CERTIFICATES IN SUPPORT OF THIS STATEMENT.