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

No. - BHE/PW/PUR/KNT-STG/562

FOR

HANDLING SITE STORAGE YARD, STORES, TRANSPORTATION TO SITE, ERECTION, TESTING, COMMISSIONING AND HANDING OVER OF STEAM TURBINE, TURBO-GENERATOR, CONDENSER, TG INTEGRAL PIPING & AUXILIARIES OF 1x 500 MW, UNIT# 7

AT

KORBA SUPER THERMAL POWER STATION,

NTPC LIMITED

KORBA, CHHATTISGARH STATE

PART I - TECHNICAL BID

BOOK NO. :

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

C O N T E N T S

SN	DESCRIPTION	SECTION/ APPENDIX NO.	NO OF PAGES
27	LIST OF T&PS TO BE MADE AVAILABLE BY BHEL	APPENDIX-IV	1
28	MAJOR T&Ps & MMDS TO BE DEPLOYED BY THE CONTRACTOR	APPENDIX-V	2
29	ANALYSIS OF UNIT RATES QUOTED	APPENDIX-VI	1
30	MANPOWER DEPLOYMENT PLAN BY THE CONTRACTOR	APPENDIX-VII	1
31	CONTRACTOR'S T&P DEPLOYMENT PLAN	APPENDIX-VIII	1
32	DETAILS OF CONCURRENT COMMITMENT	APPENDIX-IX	1
33	LIST OF EOT / HOT CRANES FOR 2x500 MW KORBA STPP	APPENDIX-X	**5**
34	DETAILS OF SIMILAR WORK DOEN DURING THE LAST SEVEN YEARS.	APPENDIX-XI	**1**
35	RATE SCHEDULE (PRICE BID : PART-II)		**@**

LEGEND:

$: Included in Tender Specifications Part-I. Hosted in BHEL web page (www.bhel.com) as file titled **"NIT+GCC-562".**

@: Issued as separate hard copy booklet 'Tender Specifications Part-II (Price Bid)'. Hosted in BHEL web page (www.bhel.com) as file titled **"PRICE BID-562"**

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-562**

BHARAT HEAVY ELECTRICALS LIMITED

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

FOR

HANDLING SITE STORAGE YARD, STORES, TRANSPORTATION TO SITE, ERECTION, TESTING, COMMISSIONING AND HANDING OVER OF STEAM TURBINE, TURBO-GENERATOR, CONDENSER, TG INTEGRAL PIPING & AUXILIARIES OF 1x 500 MW, UNIT# 7

AT

KORBA SUPER THERMAL POWER STATION,

NTPC LIMITED

KORBA, CHHATTISGARH STATE

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

LAST DATE AND TIME FOR
RECEIPT OF OFFERS

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

M/s. .....

.....

.....

PLEASE NOTE :

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

For Bharat Heavy Electricals Limited

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

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

PROCEDURE FOR SUBMISSION OF SEALED TENDERS

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

PART-I (TECHNICAL BID) COVER-I

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

PART-II (PRICE BID) COVER-II

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

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

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

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

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

CONTRACTOR SHOULD HAVE SOUND FINANCIAL STABILITY.

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

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

CLARIFICATION ON TENDER IF ANY, SHALL BE OBTAINED BY THE TENDERER BEFORE SUBMITTING THEIR OFFER.

OFFERS MUST BE SUBMITTED WITHOUT ANY DEVIATION.

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

PROJECT INFORMATION

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 Chhattisgarh 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 UTs of Western Region.

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

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

Note : strike off yes or no, as applicable

Date : signature of bidder

DECLARATION SHEET

I, HEREBY CERTIFY THAT ALL THE INFORMATION AND DATA FURNISHED BY ME WITH REGARD TO THE TENDER SPECIFICATION NO.BHE/PW/PUR/KNT-STG/562 ARE TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE. I HAVE GONE THROUGH THE SPECIFICATIONS, CONDITIONS AND STIPULATIONS IN DETAIL AND AGREE TO COMPLY WITH THE REQUIREMENTS AND INTENT OF THE SPECIFICATION. I FURTHER CERTIFY THAT I AM DULY AUTHORIZED REPRESENTATIVE OF THE UNDER-MENTIONED TENDERER AND A VALID POWER OF ATTORNEY TO THIS EFFECT IS ALSO ENCLOSED.

AUTHORISED REPRESENTATIVE'S SIGNATURE WITH
NAME AND ADDRESS

DATE:

TENDERER'S NAME AND ADDRESS

CERTIFICATE OF NO DEVIATION

TENDER SPECIFICATION NO.

BHE/PW/PUR/KNT-STG/562

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

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

SIGNATURE OF THE TENDERER

DATE:

SECTION-3
OFFER OF THE CONTRACTOR

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

DEAR SIR,

I/WE HEREBY OFFER TO CARRY OUT THE WORK DETAILED IN TENDER SPECIFICATION NO. BHE/PW/PUR/KNT-STG FOR UNIT-7 ISSUED BY BHARAT HEAVY ELECTRICALS LIMITED, POWER SECTOR-WESTERN REGION, NAGPUR, IN ACCORDANCE WITH THE TERMS AND CONDITIONS THEREOF.

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

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

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

EMD SHALL BE REFUNDED SHOULD OUR OFFER NOT BE ACCEPTED / EMD **NEED NOT BE REFUNDED AND THE AMOUNT MAY BE TREATED AS "ONE TIME EMD" FOR ERECTION AND COMMISSIONING TENDERS OF BHEL-PSWR, NAGPUR**. SHOULD OUR OFFER BE ACCEPTED, I/WE FURTHER AGREE TO DEPOSIT SECURITY DEPOSIT FOR THE WORK AS PROVIDED FOR IN THE TENDER SPECIFICATION WITHIN THE STIPULATED TIME AS MAY BE INDICATED BY BHEL, POWER SECTOR-WESTERN REGION, NAGPUR.

OR,

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

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

PLACE: SIGNATURE OF TENDERER:
DATE : ADDRESS:

WITNESSES WITH THEIR ADDRESS

SIGNATURE	NAME	ADDRESS
1.		

2.

SECTION- 4

SPECIAL CONDITIONS OF CONTRACT

4.0 GENERAL

THE WORK TO BE CARRIED OUT UNDER THE SCOPE OF THESE SPECIFICATIONS IS BROADLY AS UNDER:

1) COLLECTION OF MATERIALS AT BHEL/ CLIENT STORES, STORAGE YARD, LOADING, TRANSPORTATION TO, UNLOADING AT SITE OF WORK, PRE-ASSEMBLY, IF ANY, PRE-ERECTION CHECKS AS APPLICABLE

2) ERECTION, ALIGNMENT AND WELDING, BOLTING, FASTENING, GROUTING AS APPLICABLE OF:

   a) COMPLETE SET OF 1X500 MW STG AND AUXILIARIES AND INCLUDING TG INTEGRAL PIPING AND BOIs
   b) BOUGHT OUT ITEMS SUCH AS PUPMS, HOISTS, CRANES ETC

   c) MAIN CIRCULTING WATER PIPING INCLUDING BUTTERFLY VALVES OF CONDENSER INLET AND OUTLET UP TO CUSTOMER TERMINAL POINT IN TG AREA

4) NON-DESTRUCTIVE EXAMINATION & POST WELD HEAT TREATMENT

5) PRE-COMMISSIONING CHECKS/TEST, TRIAL RUN/TESTING AND COMMISSIONING ASSISTANCE

6) TRIAL OPERATION AND PERFORMANCE GUARENTEE TEST.

7) HANDING OVER OF THE UNIT

4.1 SCOPE OF WORK IS FURTHER DETAILED IN VARIOUS CLAUSES HEREINAFTER.

4.1.1 GENERAL REQUIREMENTS – COMMON TO ALL WORK

4.1.1.1
THE INTENT OF SPECIFICATION IS TO PROVIDE SERVICES ACCORDING TO THE MOST MODERN AND PROVEN TECHNIQUES AND CODES. THE OMISSION OF SPECIFIC REFERENCE TO ANY METHOD, EQUIPMENT OR MATERIAL NECESSARY FOR PROPER AND EFFICIENT EXECUTION OF THIS WORK SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF PROVIDING SUCH FACILITIES TO COMPLETE THE WORK WITHOUT ANY EXTRA COMPENSATION.

4.1.1.2
THE TERMINAL POINTS DECIDED BY BHEL SHOULD BE FINAL AND BINDING ON THE CONTRACTOR FOR DECIDING THE SCOPE OF WORK AND EFFECTING PAYMENT FOR THE WORK DONE.

4.1.1.3
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 BHEL, BHEL'S CUSTOMER, CUSTOMER'S CONSULTANTS AND OTHER CONTRACTORS, COORDINATING HIS WORK WITH OTHERS AND PROCEED IN A MANNER THAT SHALL NOT DELAY OR HINDER THE PROGRESS OF WORK OF THE PROJECT AS A WHOLE.

4.1.1.4
THE WORK COVERED UNDER THIS SPECIFICATION IS OF HIGHLY SOPHISTICATED NATURE, REQUIRING THE BEST QUALITY WORKMANSHIP, SUPERVISION, ENGINEERING AND CONSTRUCTION MANAGEMENT. THE CONTRACTOR SHOULD ENSURE PROPER PLANNING AND SUCCESSFUL & TIMELY COMPLETION OF THE WORK TO MEET THE OVERALL PROJECT SCHEDULE. THE CONTRACTOR MUST DEPLOY ADEQUATE QUANTITY OF TOOLS & PLANTS, MODERN / LATEST CONSTRUCTION AIDS ETC. HE MUST ALSO DEPLOY ADEQUATE TRAINED, QUALIFIED AND EXPERIENCED SUPERVISORY STAFF AND SKILLED PERSONNEL.

4.1.1.5
CONTRACTOR SHALL ERECT AND COMMISSION ALL THE EQUIPMENTS AND AUXILIARIES AS PER THE SEQUENCE & METHODOLOGY PRESCRIBED BY BHEL DEPENDING UPON THE TECHNICAL REQUIREMENTS. AVAILABILITY OF MATERIALS AND FRONTS WILL DECIDE THIS. BHEL ENGINEER'S DECISION REGARDING CORRECTNESS OF THE WORK AND METHOD OF WORKING SHALL BE FINAL AND BINDING ON THE CONTRACTOR. NO CLAIMS FOR EXTRA PAYMENT FROM THE CONTRACTOR WILL BE ENTERTAINED ON THE GROUND OF DEVIATION FROM THE METHODS / SEQUENCE ADOPTED IN ERECTION OF SIMILAR SETS ELSEWHERE.

4.1.1.6
ALL NECESSARY CERTIFICATES AND LICENSES, PERMITS & CLEARANCES REQUIRED TO CARRY OUT THIS WORK FROM THE RESPECTIVE STATUTORY/ LOCAL AUTHORITIES ARE TO BE ARRANGED BY THE CONTRACTOR AT HIS COST IN TIME TO ENSURE SMOOTH PROGRESS OF WORK.

4.1.1.7
THE WORK SHALL CONFORM TO DIMENSIONS AND TOLERANCES SPECIFIED IN THE VARIOUS DRAWINGS / DOCUMENTS THAT WILL BE PROVIDED DURING VARIOUS STAGES OF ERECTION. IF ANY PORTION OF WORK IS FOUND TO BE DEFECTIVE IN WORKMANSHIP, NOT CONFORMING TO DRAWINGS OR OTHER STIPULATIONS DUE TO CONTRACTOR'S FAULT, THE CONTRACTOR SHALL DISMANTLE AND RE-DO THE WORK DULY REPLACING THE DEFECTIVE MATERIALS AT HIS COST, FAILING WHICH THE WORK WILL BE GOT DONE BY BHEL AND RECOVERIES WILL BE EFFECTED FROM THE CONTRACTOR'S BILLS TOWARDS EXPENDITURE INCURRED INCLUDING COST OF MATERIALS AND DEPARTMENTAL OVERHEADS OF BHEL.

4.1.1.8
THE CONTRACTOR SHALL PERFORM ANY SERVICES, TESTS ETC THAT MAY NOT BE SPECIFIED NEVERTHELESS REQUIRED FOR THE COMPLETION OF WORK WITHIN QUOTED RATES.

4.1.1.9
ALL NECESSARY CERTIFICATES AND LICENSES REQUIRED FOR CARRYING OUT THIS WORK ARE TO BE ARRANGED BY THE CONTRACTOR EXPEDITIOUSLY.

4.1.1.10
THE CONTRACTOR SHALL EXECUTE THE WORK IN THE MOST SUBSTANTIAL AND WORKMANLIKE MANNER. THE STORES SHALL BE HANDLED WITH CARE AND DILIGENCE.

4.1.1.11
BHEL RESERVES RIGHT TO RECOVER FROM THE CONTRACTOR ANY LOSS WHICH ARISES OUT OF UNDUE DELAY/DISCREPANCY/SHORTAGE/DAMAGE OR ANY OTHER CAUSES DUE TO

CONTRACTOR'S LAPSE DURING ANY STAGE OF WORK. ANY LOSS TO BHEL DUE TO CONTRACTOR'S LAPSE SHALL HAVE TO BE MADE GOOD BY THE CONTRACTOR.

4.1.1.12
ALL CRANES, TRANSPORT EQUIPMENT, HANDLING EQUIPMENT, TOOLS, TACKLES, FIXTURES, EQUIPMENT, MANPOWER, SUPERVISORS/ENGINEERS, CONSUMABLES ETC, EXCEPT OTHERWISE SPECIFIED AS BHEL SCOPE AS FREE ISSUE, REQUIRED FOR THIS SCOPE OF WORK SHALL BE PROVIDED BY THE CONTRACTOR. ALL EXPENDITURE INCLUDING TAXES AND INCIDENTALS IN THIS CONNECTION WILL HAVE TO BE BORNE BY HIM UNLESS OTHERWISE SPECIFIED IN THE RELEVANT CLAUSES. THE CONTRACTOR'S QUOTED RATES SHALL BE INCLUSIVE OF ALL SUCH CONTINGENCIES.

4.1.1.13
DURING THE COURSE OF ERECTION, TESTING AND COMMISSIONING CERTAIN REWORK / MODIFICATION / RECTIFICATION / REPAIR / FABRICATION ETC MAY BECOME NECESSARY ON ACCOUNT OF FEED BACK / REVISION OF DRAWING. THIS WILL ALSO INCLUDE MODIFICATIONS / RE-WORKS SUGGESTED BY BHEL / CUSTOMER / 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 FOR SUCH REWORKS. CLAIM OF CONTRACTOR IF ANY, FOR SUCH WORKS WILL BE GOVERNED BY CLAUSES OF SECTION-13 SPECIAL CONDITIONS OF CONTRACT.

4.1.1.14
ALL WORKS SUCH AS CLEANING, LEVELING, ALIGNING, TRIAL ASSEMBLY, DISMANTLING OF CERTAIN EQUIPMENTS / COMPONENTS FOR CHECKING AND CLEANING, SURFACE PREPARATION, FABRICATION OF STRUCTURES, TUBES AND PIPES AS PER GENERAL ENGINEERING PRACTICE AND AS PER BHEL ENGINEER'S INSTRUCTIONS AT SITE, CUTTING, GOUGING, WELD DEPOSITING, GRINDING, STRAIGHTENING, CHAMFERING, FILING, CHIPPING, DRILLING, REAMING, SCRAPPING, LAPPING, FITTING UP, DRILLING OF HOLES, MAKING DOWEL PINS AND MINOR RECTIFICATION OF FOUNDATION BOLTS 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 WITHIN THE QUOTED RATES.

4.1.1.15
THE CONTRACTOR SHALL MAKE ALL FIXTURES, TEMPORARY SUPPORTS, STEEL STRUCTURES REQUIRED FOR JIGS & FIXTURES, ANCHORS FOR LOAD AND GUIDE PULLEYS REQUIRED FOR THE WORK. NECESSARY STEEL SHALL BE ARRANGED BY CONTRACTOR.

4.1.1.16
THE CONTRACTOR SHALL TAKE DELIVERY OF THE COMPONENTS, EQUIPMENTS, CHEMICALS, AND LUBRICANTS ETC FROM THE BHEL STORES/ STORAGE AREA AFTER GETTING THE APPROVAL OF BHEL ENGINEER ON STANDARD INDENT FORMS OF BHEL. COMPLETE AND DETAILED ACCOUNT OF THE MATERIALS AND EQUIPMENTS AFTER USAGE SHALL BE SUBMITTED TO THE BHEL AND RECON CILED PERIODICALLY. MATERIALS ISSUED EXCESS/ UNSPENT AS ALSO THE PARTIALLY FILLED/ EMPTY CONTAINERS AFTER USE HAVE TO BE RETURNED TO BHEL STORES DULY ACCOUNTED AND IDENTIFIED.

4.1.1.17
THE ROAD LENGTH TO STORAGE YARD FROM THE PROJECT SITE IS ABOUT 4-5 KM. THERE IS AN UNLOADING BAY FOR CONSIGNMENTS ARRIVING ON RAILS WHICH IS ABOUT 2 KM FROM STORAGE YARD. THESE ARE APPROXIMATE DISTANCES ANY VARIATION IN THESE DISTANCES SHALL NOT ENTITLE CONTRACTOR ANY ADDITIONAL COMPENSATION OR ANY CLAIM OF ANY KIND.

4.1.1.18

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, SAME SHALL BE DONE BY CONTRACTOR MOST EXPEDITIOUSLY. NO CLAIM FOR EXTRA PAYMENT FOR SUCH WORK WILL BE ENTERTAINED.

4.1.1.19
PLANT MATERIALS SHOULD NOT BE USED FOR ANY TEMPORARY SUPPORTS / SCAFFOLDING/ PREPARING PRE-ASSEMBLY BED ETC.

4.1.1.20
THE DETAILS OF EQUIPMENTS TO BE ERECTED UNDER THIS CONTRACT IS GENERALLY AS PER THE SCHEDULE GIVEN IN APPENDIX-I. THESE DETAILS ARE APPROXIMATE AND MEANT ONLY TO GIVE A GENERAL IDEA TO THE TENDERER ABOUT THE WORK INVOLVED. ACTUAL QUANTUM AND TYPE OF EQUIPMENTS WILL BE BASED ON THE ERECTION DOCUMENTS, WHICH WILL BE FURNISHED IN THE COURSE OF ERECTION, AND THE WEIGHT AND QUANTITY AS PER THE RELEVANT ENGINEERING DOCUMENTS WILL ONLY BE ADMISSIBLE FOR THE BILLING PURPOSE.

4.1.1.21
HANGERS & SUSPENSIONS, SUPPORTS ETC FOR TUBES & PIPING, & WILL BE SUPPLIED IN RUNNING / RANDOM LENGTHS / SIZES WHICH SHALL BE CUT TO SUITABLE SIZES AND ADJUSTED AS REQUIRED.

4.1.1.22
LAYOUT OF FIELD ROUTED/ SMALL BORE PIPING SHALL BE DONE AS PER SITE REQUIREMENT. NECESSARY SKETCH FOR ROUTING THESE LINES SHOULD BE GOT APPROVED FROM BHEL BY THE CONTRACTOR. THERE IS A POSSIBILITY OF SLIGHT CHANGE IN ROUTING THE ABOVE PIPE LINES EVEN AFTER COMPLETION OF ERECTION.

4.1.1.23
WELDING OF NECESSARY INSTRUMENTATION TAPPING POINTS, THERMOWELL, THERMOCOUPLE PAD, ROOT VALVE, CONDENSING VESSEL, FLOW METERING & MEASUREMENT DEVICES, AND CONTROL VALVES TO BE PROVIDED ON TG INTEGRAL PIPING.

SIMILARLY, CONTRACTOR SHALL MOUNT ALL FLOW INDICATORS, CENTRIFUGAL/SPEED SWITCHES OF MOTORS, ACCUMULATORS, PRESSURE REGULATORS, ETC WHICH ARE RECEIVED LOOSE AND WHICH ARE TO BE ERECTED/MOUNTED AT SITE ON AIR, WATER, OIL, AND STEAM LINES, AUXILIARIES ETC. THESE ARE TO BE MOUNTED DURING ERECTION FOR FINALISING ROUTING/POSITION ETC. THEY ARE TO BE DISMANTLED AFTER COMPLETION OF ERECTION WORK AND HANDED OVER TO BHEL FOR CALIBRATION. AFTER CALIBRATION, THESE INSTRUMENTS SHALL BE REMOUNTED BY THE CONTRACTOR IN THEIR RESPECTIVE POSITIONS JUST BEFORE COMMISSIONING.

4.1.1.24
PRE-HEATING, NDE, AND POST WELD HEAT TREATMENT FOR ABOVE SHALL BE DONE AS PER THE SPECIFICATIONS AS PART OF WORK.

4.1.1.25
CERTAIN INSTRUMENTATION LIKE PRESSURE SWITCHES, AIR SETS, FILTERS, REGULATORS, PRESSURE GAUGES, JUNCTION BOXES, POWER CYLINDERS, DIAL THERMOMETERS, FLOW METERS, VALVE ACTUATORS, FLOW INDICATORS, CENTRIFUGAL/SPEED SWITCHES OF MOTORS, ACCUMULATORS ETC ARE RECEIVED IN

ASSEMBLED CONDITION AS INTEGRAL PART OF EQUIPMENTS. CONTRACTOR SHALL DISMOUNT SUCH INSTRUMENTS FOR CALIBRATION AND HAND OVER THE SAME TO BHEL. STORAGE, CALIBRATION, RE-ERECTION WILL BE DONE BY C & I ERECTION AGENCY.

4.1.1.26
FIXING AND SEAL WELDING OF THERMOWELLS & PLUGS BEFORE HYDRO TEST/ STEAM BLOWING OF EQUIPMENT OR OTHER PIPING SYSTEM IS WITHIN THE SCOPE OF WORK. CONTRACTOR SHALL ALSO REMOVE THE SEAL WELDED PLUGS BY PROCESS OF GRINDING AND FIX AND SEAL WELD THERMOWELLS AFTER HYDRO TEST/STEAM BLOWING OF LINES AS PART OF WORK.

4.1.1.27
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. BHEL WILL PROVIDE THE MOTORIZED INSULATION TESTERS AND MICRO-OHM METERS.

4.1.1.28
IN INSTALLATION OF VARIOUS EQUIPMENTS IT MAY BECOME NECESSARY TO INSTALL THESE ON TEMPORARY SUPPORTS/ HANGER DUE TO VARIOUS REASONS INCLUDING NON-AVAILABILITY OF SUSPENSION MATERIALS. CONTRACTOR SHALL INSTALL SUCH TEMPORARY SUSPENSIONS/HANGERS AND LATER ON SHIFT THE RELEVANT EQUIPMENTS TO THEIR RESPECTIVE PERMANENT HANGERS/ SUSPENSIONS/ SUPPORTS AS INCIDENTAL TO WORK. REQUISITE MATERIALS FOR SUCH TEMPORARY ARRANGEMENTS WILL BE PROVIDED BY BHEL ON FREE -RETURNABLE BASIS WHICH SHALL BE RETURNED TO BHEL AFTER THE USE.

4.1.1.29
THE WORK SHALL BE CARRIED OUT STRICTLY IN ACCORDANCE TO THE "FIELD QUALITY PLAN" APPROVED BY BHEL/NTPC. THE CONTRACTOR SHALL PREPARE, JOINTLY WITH BHEL, ALL NECESSARY RECORDS OF MEASUREMENTS/READINGS/ PROTOCOLS ETC.

4.1.1.30
INTERCONNECTION/ HOOKUP, IF ANY, WITH THE EXISTING SYSTEM SHALL FORM PART OF WORK. SUCH INTERCONNECTIONS, HOOKUPS MAY REQUIRE SHUT DOWN OF RUNNING PLANT AND THE RELEVANT WORK HAVE TO BE COMPLETED WITHIN SUCH PLANNED SHUTDOWNS. THIS MAY CALL FOR WORKING WITH ENHANCED RESOURCES AND ON EXTENDED HOURS. CONTRACTOR'S OFFER SHALL COVER ALL SUCH CONTINGENCIES.

4.1.1.31
ALL THE HT MOTORS SHALL BE PRESERVED WITH SPACE HEATERS ON, AND PROVIDED WITH PROPER COVER TILL THE COMMISSIONING OF THE MOTORS.

4.1.1.32
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.**

4.2 PREPARATION OF FOUNDATIONS, AND GROUTING OF EQUIPMENT OF STG & AUXILIARIES

4.2.1
BUILDINGS, FOUNDATIONS AND OTHER NECESSARY CIVIL WORKS FOR SUPPORTING STRUCTURES, EQUIPMENTS ETC, WILL BE PROVIDED BY THE BHEL/CUSTOMER. THE

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

4.2.2
ALL TEMPORARY FOUNDATIONS AND ANCHOR POINTS REQUIRED FOR INSTALLING ERECTION EQUIPMENTS AND WINCHES ETC ARE IN THE SCOPE OF CONTRACTOR. ALL BUILDING MATERIALS LIKE CEMENT, STEEL INCLUDING RE-INFORCEMENT BARS, GRITS CEMENTS ETC FOR SUCH TEMPORARY FOUNDATIONS SHALL HAVE TO BE ARRANGED BY THE CONTRACTOR WITHIN THE QUOTED RATES. ALL SUCH FOUNDATIONS SHALL BE DEMOLISHED AND NORMAL GROUND CONDITIONS RESTORED AFTER THE USAGE.

4.2.3
THE COMPLETE WORK OF SECONDARY GROUTING OF EQUIPMENTS (STATIC AS WELL AS ROTATING) ETC IS INCLUDED IN THE SCOPE OF WORK/SPECIFICATION. CONTRACTOR SHALL ARRANGE ALL MANPOWER, T&P, FORM WORK AND SHUTTERING MATERIALS, ALL GROUTING MATERIALS SUCH AS ORDINARY PORTLAND CEMENT, SAND, STONE CHIPS ETC & QUICK-SETTING-NON-SHRINK-FREE-FLOW SPECIAL GROUT MIX OF REQUIRED SPECIFICATION (LIKE CONBEXTRA-GP1/ GP2 OR EQUIVALENT).

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

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

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

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

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

4.2.5
PACKER PLATES SHALL NOT ONLY BE BLUE MATCHED WITH FOUNDATIONS BUT ALSO INTER-PACKER CONTACT SURFACES, CONTACT SURFACES BETWEEN PACKER AND PEDESTALS, CONTACT SURFACE BETWEEN PACKER AND FOUNDATION FRAME ETC SHALL ALSO BE BLUE MATCHED AND REQUIRED QUANTUM OF CONTACT SHALL BE ACHIEVED BY CHIPPING AND SCRAPPING AS PER ENGINEER'S INSTRUCTIONS.

4.2.6
THE CONTRACTOR SHALL CARRY OUT SCRAPPING AND MATCHING OF EMBEDDED PLATES, PERMANENT SPACERS AND ALL THE MATCHING PARTS OF TURBINE, GENERATOR, PUMPS AND OTHER EQUIPMENTS WHEREVER REQUIRED. THE SUPPORT AND SOLE PLATES MATCHING AND CONCRETE SURFACE BEDDING IS ALSO COVERED IN THE SCOPE OF WORK. THE FINE DRESSING OF CONCRETE SHALL BE WITH PRUSSIAN BLUE-MATCH CHECKS.

4.3 EQUIPMENTS INSTALLATION – COMMON REQUIREMENTS

4.3.1
FILLING OF LUBRICANTS FOR STEAM TURBINE, TURBO-GENERATOR AND OTHER ROTATING AUXILIARIES FOR PURPOSE OF OIL FLUSHING, INITIAL FILL UP AND SUBSEQUENT TOPPING UP DURING VARIOUS STAGES OF WORK.

4.3.2

4.3.3
CLEANING, SERVICING, LUBRICATION OF ACTUATORS, PUMPS, HEADERS, GOVERNING SYSTEM, ESV & IV, CONTROL VALVES, LP BYPASS AND OTHER VALVES, TANKS, VESSELS ETC. DURING ERECTION AND COMMISSIONING STAGES IS IN THE SCOPE OF WORK. HOWEVER, GASKETS/PACKINGS/LUBRICANTS FOR REPLACEMENT WILL BE PROVIDED BY BHEL AS FREE ISSUE.

4.3.4
ALL EQUIPMENT SHALL BE PRESERVED AND PROTECTED PERIODICALLY BEFORE AND AFTER ERECTION AS PER ADVICE OF BHEL ENGINEER. THE JOURNALS OF STEAM TURBINE ROTORS, GENERATOR ROTOR, HT MOTORS AND OTHER ROTATING MACHINES SHALL BE THOROUGHLY CLEANED, GREASED/PAINTED WITH PRESERVATIVE AGENTS PERIODICALLY AS INSTRUCTED BY BHEL ENGINEER.

4.3.5
TRIAL RUN OF ALL MOTORS INCLUDING CHECKING DIRECTION OF ROTATION IN UNCOUPLED CONDITION, CHECK ALIGNMENT AND RE-COUPLE THE MOTOR TO DRIVEN EQUIPMENT.

4.3.6
AFTER INITIAL TRIAL OF ROTATING EQUIPMENTS, CONTROL AND POWER CABLING FOR MOTORS AND OTHER EQUIPMENTS/INSTRUMENTATION MAY HAVE TO BE DISCONNECTED FOR CHECKING ALIGNMENT AND RESETTING/ REALIGNMENT/ HOT ALIGNMENT. CONTRACTOR WILL HAVE TO PROVIDE SERVICES FOR DISCONNECTION AND RECONNECTION OF CONTROL AND POWER CABLES.

4.3.7
ALL RACKS OR ASSEMBLED UNITS LIKE GOVERNING RACK, LP BYPASS RACK, SEAL OIL UNIT, GAS UNIT, SEAL OIL VALVE RACK, PRIMARY WATER UNIT, GAS CYLINDER RACKS ETC SUPPLIED FROM MANUFACTURING UNITS WILL BE TESTED IN BHEL/ CUSTOMER STORES OR AT SITE. THIS MAY REQUIRE TRANSPORTATION, FILLING OF OIL, WATER ETC IN THESE RACKS FOR CARRYING OUT TESTING OF THESE RACKS. DEFECTS NOTICED DURING TESTING OF THESE RACKS WILL HAVE TO BE RECTIFIED BY THE CONTRACTOR. FURTHER,

ANY PIPELINE / FLANGES / FITTINGS NOT FOUND ASSEMBLED PROPERLY, THE SAME HAVE TO BE RECTIFIED / CORRECTED BY THE CONTRACTOR.

4.4 PIPING INSTALLATION

4.4.1
THE SCOPE OF WORK IN PIPING SYSTEM (AIR, WATER, OIL, STEAM ETC.) WILL INCLUDE CUTTING TO REQUIRED LENGTH, EDGE PREPARATION, LAYING, FIXING AND WELDING OF THE ELBOWS/FITTINGS/VALVES ETC., FIXING SUPPORTS/HANGERS/SHOCK ABSORBERS/ GUIDES AND RESTRAINTS ETC. AND CARRYING OUT ALL OTHER ACTIVITIES/WORKS TO COMPLETE THE ERECTION AND ALSO CARRYING OUT ALL PRE-COMMISSIONING/ COMMISSIONING OPERATIONS MENTIONED IN THESE SPECIFICATIONS AS PER ENGINEER'S INSTRUCTIONS AND/OR AS PER APPROVED DRAWINGS.

4.4.2
CARRYING OUT OF PIPING AS PER THE SPECIFICATIONS BETWEEN EQUIPMENTS CONSTITUTING TERMINAL POINTS, 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 EITHER ENDS, WITH DUE NDE & PWHT IF APPLICABLE, FOR ALL THE PIPING SCHEMES COVERED IN THE SCOPE OF WORK.

4.4.3
FIT UP AND WELDING/BOLTING/FASTENING OF PIPING TO THE TERMINAL POINTS (SUCH AS STUBS, VALVES, FLANGES ON TERMINAL POINTS/EQUIPMENTS, STUBS ON HEADERS, BATTERY LIMITS ETC) FORMING PART OF THE SCOPE OF WORK/SPECIFICATION AND STRESS RELIEVING AND RADIOGRAPHY OF JOINTS SO MADE ARE ALSO WITHIN THE SCOPE OF WORK. PERMANENT FASTENERS AND GASKETS WILL BE SUPPLIED BY BHEL.

4.4.4
ALL DRAINS / VENTS / RELIEF / ESCAPES / SAFETY VALVE PIPING TO VARIOUS TANKS/ SEWAGE / DRAIN CANAL / FLASH BOX / CONDENSER / SUMP / ATMOSPHERE ETC. FROM THE STUBS ON THE PIPING AND EQUIPMENTS ERECTED BY CONTRACTOR IS COMPLETELY COVERED IN THE SCOPE OF THIS TENDER.

4.4.5
THE FOLLOWING ITEMS OF WORK SHALL BE INCIDENTAL AND FORMING PART OF PIPING FABRICATION AND ERECTION

A) TO LOCATE CAUSE OF VIBRATIONS IN EQUIPMENTS/AUXILIARIES/PIPELINES AND CARRYING OUT NECESSARY CORRECTIONS IN CASE THE SAME IS ATTRIBUTED TO THE CONTRACTOR.
B) FABRICATION AND ERECTION & WELDING OF RACKS, STEEL SUPPORTS, GUIDES, RESTRAINTS FOR ALL THE PIPING. STEEL FOR THIS PURPOSE WILL BE SUPPLIED BY BHEL FREE OF CHARGE IN RANDOM AND RUNNING LENGTHS.
C) PRE-ASSEMBLY OF SPRING SUSPENSION/HANGERS AND SHOCK ABSORBER AS PER REQUIREMENT.
D) ERECTION OF STEAM TRAPS, FILTERS, FLOW NOZZLES/ FLOW INDICATORS/ FLOW ORIFICES OTHER MEASURING ELEMENTS IN THE PIPING. THESE MAY HAVE BEEN SUPPLIED EITHER BY BHEL OR ANY OTHE AGENCY. THIS MAY INVOLVE CUTTING OF PIPE LINES, FRESH EDGE PREPARATION AND WELDING WITH STRESS RELIEVING WHEREVER APPLICABLE.
E) FABRICATION / MAKING OF BENDS FOR PIPES AND TUBES OF DIAMETER UPTO 65MM.
F) MATCHING OF ALL FITTINGS LIKE TEES, BENDS, FLANGES, REDUCERS VALVES, SOCKET FITTINGS, ETC WITH PIPES FOR WELDING.
G) SERVICING OF VALVES AND ACTUATORS
H) CLEANING OF ALL PIPES BY WIRE BRUSHING / BLOWING BY COMPRESSED AIR.

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

J) WELDING OF BLANKS WITH STRESS RELIEVING IF REQUIRED ON A TEMPORARY BASIS.

4.4.6

PIPELINES WILL BE FIELD ROUTED AS PER SCHEMES/ SUGGESTIVE LAYOUT OR AS PER THE INSTRUCTIONS OF BHEL ENGINEER. PIPES & TUBES WILL BE SUPPLIED IN RANDOM LENGTHS AND RUNNING LENGTHS. THE CONTRACTOR SHALL HAVE TO LAY THE PIPING AFTER CARRYING OUT THE NECESSARY FABRICATION, EDGE PREPARATION, ROUTING ETC TO SUIT SITE REQUIREMENT IN BEST PROFESSIONAL MANNER.

4.4.7

AS FAR AS POSSIBLE PRE-ASSEMBLY SHALL BE DONE. 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 SETTINGS TO BE ENSURED AS PER REQUIREMENT.

4.4.8

ADJUSTMENT OF SPRING HANGERS FOR PIPING SHALL BE DONE BY THE CONTRACTOR DURING INITIAL ERECTION. AFTER INITIAL COMMISSIONING TRIALS, IT IS POSSIBLE THAT THE SPRING HANGERS HAVE TO BE ADJUSTED REPEATEDLY TILL THE CORRECT SPRING COMPRESSION IS ACHIEVED. CONTRACTOR SHALL DO THE SAME TO THE SATISFACTION OF BHEL ENGINEER. THE MARKING OF COLD AND HOT POSITIONS ON THE HANGERS SHALL BE DONE BY THE CONTRACTOR.

4.5 CONDENSER INSTALLATION

4.5.1

THE CONDENSER WILL BE DESPATCHED IN LOOSE PARTS MAINLY COMPRISING OF BOTTOM PLATES, DOME WALLS, FRONT AND REAR WATER CHAMBER, FRONT AND REAR WATER BOXES, SIDE WALLS, HOT WELL, SPRING ELEMENTS, SUPPORT PLATES, AIR EXTRACTION PIPES, BAFFLES, STIFFENING RODS AND PIPES ETC. THE CONDENSER IS TO BE ASSEMBLED AT SITE IN POSITION BY WELDING THE DIFFERENT PARTS. CONDENSER TUBING AND TUBE EXPANSION (ROLLER EXPANSION) IS TO BE DONE AT SITE BY THE CONTRACTOR, AFTER TAKING DUE CARE TO CLEAN ALL THE TUBE HOLES. AFTER FINAL ALIGNMENT AND LEVELLING OF TURBINE EXHAUST AND CONDENSER, THE SAME HAS TO BE WELDED TO THE EXHAUST POSITION OF LP EXHAUST AS PER THE SEQUENTIAL WELDING PROCEDURE. CONDENSER TUBE MATERIAL IS STAINLESS STEEL.

4.5.2

BEFORE INSERTION OF TUBES, THE CONTRACTOR SHALL CLEAN THE HOLES IN THE TUBE PLATES AND TUBE SUPPORT PLATES TO REMOVE PAINT, CORROSION SPOTS, OXIDE SCALES ETC. USAGE OF SUITABLE CLEANING AGENT MAY ALSO BE REQUIRED WHICH HAS TO BE SUPPLIED BY THE CONTRACTOR.

4.5.3

THE TUBES SHALL BE EXPANDED USING AN AUTOMATIC ELECTRONIC TORQUE CONTROLLED TUBE EXPANDING UNIT OR PNEUMATIC TUBE EXPANDER. TUBE EXPANSION SHALL BE CHECKED WITH DIAL BORE GAUGE. THE TOTAL SET UP INCLUDING TUBE EXPANDERS AND TUBE CUTTING TOOLS ETC. FOR CARRYING OUT THE COMPLETE CONDENSER TUBE EXPANSION WORKS SHALL BE PROVIDED BY THE CONTRACTOR.

4.5.4

THE CONTRACTOR SHALL CARRY OUT THE CONDENSER NECK WELDING WITH LP CYLINDER EXHAUST HOOD ONLY AFTER FINAL INSTALLATION OF LP CASING. NECK WELDING SHALL BE SUBJECTED TO SPECIFIED NON-DESTRUCTIVE TESTING.

4.5.5
THE HYDROSTATIC TESTING OF STEAM SPACE AND HYDRAULIC TESTING OF WATER SPACE UP TO THE TERMINAL POINT AFTER ASSEMBLY OF WATER BOXES ARE ALSO INCLUDED IN THE SCOPE.

4.5.6
WORK OF PRESERVATION AND PAINTING OF CONDENSER SURFACES IN VARIOUS AREA AND AT VARIOUS STAGES OF WORK

A. STEAM SIDE PAINTING

TWO COATS OF STEAM WASHABLE PAINTS SHALL BE APPLIED ON STEAM SIDE OF LP TURBINE AND **CONDENSER SHELL INTERNALS**, AS ADVISED BY BHEL. THE STEAM WASHABLE PAINTS, PRIMER AND THINNER WILL BE SUPPLIED BY BHEL FREE. HOWEVER, ARRANGEMENTS FOR SURFACE PREPARATION AND PAINT APPLICATION, CONSUMABLES LIKE SURFACE CLEANING AGENTS, PAINT BRUSH, BRUSH CLEANSER, LABOUR AND NECESSARY TOOLS AND PLANTS ARE IN THE SCOPE OF CONTRACTOR.

ALL SITE WELD JOINTS FALLING IN STEAM SIDE SHALL **ALSO** BE PAINTED WITH TWO COATS OF STEAM WASHABLE PAINT.

B. WATER SIDE PAINTING

THE WATER BOXES SHALL BE SANDBLASTED TO REMOVE ALL TRACES OF PRIMER APPLIED AT THE WORKS. THEREAFTER TWO COATS OF EPOXIDE PRIMING PAINT FOLLOWED BY TWO/THREE COATS OF HIGH BUILD BLACK COAL TAR EPOXY (E.G., "APCODUR CP684" OF ASIAN PAINTS **OR EQUIVALENT FROM ANY OTHER BHEL/NTPC APPROVED MANUFACTURER**). CONTRACTOR SHALL SUBMIT MANUFACTURER'S BATCH TEST CERTIFICATE / TEST CERTIFICATE FROM BHEL/NTPC APPROVED LABORATORY FOR THE PRIMERS AND PAINTS. PRIOR APPROVAL OF BHEL FOR EACH AND EVERY BATCH OF THE PRIMER & PAINTS SHALL BE MANDATORY. IN ORDER TO ACHIEVE A DESIRED MINIMUM PAINT DRY FILM THICKNESS (DFT) AS SPECIFIED IN BHEL DRAWING, NUMBER OF COATS MAY BE APPLIED AND METHOD OF APPLICATION SHALL BE AS RECOMMENDED BY THE PAINT MANUFACTURER. REQUIRED PAINTS & PRIMERS AND OTHER CONSUMABLES SHALL BE ARRANGED BY CONTRACTOR.

ALL WATER SIDE SURFACES OF WATER CHAMBERS INCLUDING TUBE PLATE SHALL BE THOROUGHLY SURFACE PREPARED AND PAINTED. REQUIRED PRIMER & PAINTS AND OTHER CONSUMABLES FOR CONDENSER WATER BOX AND TUBE PLATES SHALL BE PROVIDED BY CONTRACTOR. **CARE SHALL BE TAKEN TO PLUG THE EXPANDED TUBE ENDS TO PREVENT ENTRY OF PAINT INTO THE TUBES. THE CONTRATOR SHALL ARRANGE FOR THE PLUGS IF NOT PROVIDED ALONGWITH THE TUBES.**

THE WATER SIDE PAINTING ON WATER BOXES, WATER CHAMBERS AND TUBE PLATES SHALL BE DONE PRIOR TO THE WATER SIDE HYDRAULIC TEST OF THE CONDENSER.

4.5.7 MAIN CIRCULATING COOLING WATER PIPING
THE WORK OF COMPLETE INSTALLATION OF MAIN CIRCULATING COOLING WATER PIPING OF CONDENSER INLET AND OUTLET WITH ASSOCIATED RE JOINTS AND BUTTERFLY VALVES ETC WITH NECESSARY HANGERS AND SUPPORTS UPTO CUSTOMER TERMINAL POINT IN TG AREA IS TO BE EXECUTED AS PART OF THIS WORK. IT WILL ALSO INCLUDE

ANY PAINTING / COATING TO BE DONE ON OUTSIDE AND INSIDE OF PIPE NEAR WELD JOINTS. NDE AS SPECIFIED SHALL BE PERFOMED.

4.6 GENERATOR INSTALLATION

4.6.1 GENERATOR STATOR
THE GENERATOR STATOR, WEIGHING 265 METRIC TONNES (APPROX.) , WILL BE DELIVERED TO SITE ON A SPECIAL WAGON CONSISTING OF 8 BOGIES (FOUR ON EITHER SIDE) WITH FACILITIES TO SWIVEL. THESE TWO SETS OF BOGIES ARE CONNECTED BY A CARRIER BEAM, WHICH CARRIES THE LOAD OF THE STATOR. THE CONTRACTOR SHALL HAVE TO LIFT THE GENERATOR STATOR FROM THE ABOVE TRANSPORT ARRANGEMENT IN THE UNLOADING BAY OUTSIDE THE MACHINE HALL.

4.6.2
THE GENERATOR STATOR SHALL BE LIFTED AND PLACED BY THE CONTRACTOR WITH THE HELP OF PORTAL GANTRY CRANE AS PER THE SCHEME ENVISAGED BY BHEL ON TO THE GENERATOR FOUNDATION. REFER SECTION-7 WITH REGARD TO PORTAL GANTRY CRANE.

THE ASSEMBLY OF THE SPECIAL WAGON FOR RETURN AFTER UNLOADING OF STATOR IS IN THE SCOPE OF THIS WORK.

4.7 FST & DE-AERATOR INSTALLATION

4.7.1
BHEL WILL PROVIDE ITS CRAWLER CRANE, ON SHARING BASIS, TO LIFT THE DE-AERATOR AND FEED STORAGE TANK COMPONENTS TO THE NEAREST POSSIBLE FLOOR/ELEVATION. CONTRACTOR HAS TO MAKE ARRANGEMENTS FOR DRAGGING, PLACEMENT ON FOUNDATION/PROPER ELEVATION AND FURTHER WORKS LIKE ALIGNMENT, FITUP, WELDING ETC. CONTRACTOR SHALL ALSO MAKE HIS OWN ARRANGEMENTS FOR LOADING OF THESE COMPONENTS AT STORES, TRANSPIRATION TO SITE AND UNLOADING AT SITE.

4.7.2
ERECTION OF PERMANENT APPROACH PLATFORM AND LADDERS ETC FOR DE-AERATOR AND FST IS IN THE SCOPE OF WORK. THE STRUCTURAL STEEL AND OTHER MEMBERS WILL BE SUPPLIED IN RANDOM LENGTH/SIZE & WILL HAVE TO BE CUT TO REQUIRED SIZE AND PROFILE AS INCIDENTAL TO WORK.

4.8 WELDING, RADIOGRAPHY AND OTHER NON-DESTRUCTIVE TESTING, POST WELD HEAT TREATMENT

4.8.1 WELDING
4.8.1.1
INSTALLATION OF EQUIPMENT INVOLVES GOOD QUALITY WELDING, NDE CHECKS, POST WELD HEAT TREATMENT ETC. CONTRACTOR'S PERSONNEL ENGAGED SHOULD HAVE ADEQUATE QUALIFICATION ON THE ABOVE WORKS.

4.8.1.2
THE METHOD OF WELDING (VIZ) ARC, TIG OR OTHER METHOD WILL BE INDICATED IN THE DETAILED DRAWING/DOCUMENTS. BHEL ENGINEER WILL HAVE THE OPTION OF CHANGING THE METHOD OF WELDING AS PER SITE REQUIREMENT.

4.8.1.3
All WELDING SHALL BE DONE ONLY BY DULY QUALIFIED WELDERS TESTED FOR RESPECTIVE AREA OF WORK AT SITE. ALL THE EXPENDITURE IN TESTING/QUALIFICATION OF THE CONTRACTOR'S WELDER SHALL BE BORNE BY CONTRACTOR.

4.8.1.4

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

4.8.1.5
THE WELDED SURFACE SHALL BE CLEANED OF SLAG AND PAINTED WITH PRIMER PAINT TO PREVENT RUSTING, CORROSION. FOR THIS CONSUMABLES LIKE PAINT /PRIMER ETC WILL BE IN THE CONTRACTOR'S SCOPE.

4.8.1.6
WELD JOINT FIT-UPS, SHOULD BE PROTECTED, WHERE REQUIRED, BY USE OF TAPES/PROTECTIVE PAINT AS MAY BE PRESCRIBED BY BHEL. THE CONTRACTOR SHALL ARRANGE CONSUMABLES LIKE PROTECTIVE PAINTS/TAPES ETC.

4.8.1.7
THE CONTRACTOR SHALL MAINTAIN WELDING RECORDS IN THE FORM AS PRESCRIBED BY BHEL CONTAINING ALL NECESSARY DETAILS, AND SUBMIT THE SAME TO THE BHEL ENGINEER AS REQUIRED. INTERPRETATION OF THE BHEL ENGINEER REGARDING ACCEPTABILITY OF THE WELDS SHALL BE FINAL.

4.8.1.8
JOINT FIT UP WILL BE A STAGE INSPECTION. WHERE REQUIRED, JOINTS SHALL BE OFFERED FOR VISUAL INSPECTION AFTER ROOT RUN. SUBSEQUENT WELDING SHOULD BE MADE ONLY AFTER THE APPROVAL OF ROOT RUN.

4.8.1.9 SOCKET WELDING :
IN EXECUTION OF THIS WORK, CONSIDERABLE NUMBER OF SOCKET WELD JOINTS IS INVOLVED. THE EXACT QUANTITY OF SUCH SOCKET WELDS OR PROBABLE VARIATION IN THE QUANTUM CANNOT BE FURNISHED. THE TENDERER SHALL TAKE NOTICE OF THIS WHILE QUOTING AS NO EXTRA CLAIM ON THIS ACCOUNT WILL BE ENTERTAINED. THE SOCKET WELDING ON HP PARTS/ HP PIPING SHALL BE DONE BY THE IBR QUALIFIED WELDERS. CONTRACTOR HAS TO ADHERE TO THE PROCEDURES/SPECIFICATION AS INDICATED IN THE DRAWING FOR SOCKET WELDING.

4.8.1.10
WELDING ELECTRODES HAVE TO BE STORED IN ENCLOSURES HAVING TEMPERATURE AND HUMIDITY CONTROL ARRANGEMENTS. THIS ENCLOSURE SHALL MEET BHEL SPECIFICATIONS.

4.8.1.11
WELDING ELECTRODES, PRIOR TO THEIR USE, CALL FOR BAKING FOR SPECIFIED PERIOD AND WILL HAVE TO BE HELD AT SPECIFIED TEMPERATURE FOR SPECIFIED PERIOD. ALSO, DURING EXECUTION, THE WELDING ELECTRODES HAVE TO BE CARRIED IN PORTABLE OVENS.

4.8.2 HEAT TREATMENT:

4.8.2.1
FOR THE PURPOSE OF TEMPERATURE RECORDING OF STRESS RELIEVING PROCESS, THERMOCOUPLES HAVE TO BE ATTACHED TO THE WELD JOINT. THE NUMBER OF TEMPERATURE MEASURING POINTS AND LOCATIONS SHALL BE AS PER THE STANDARDS OF BHEL. THERMOCOUPLES HAVE TO BE ATTACHED USING CAPACITOR DISCHARGE TYPE PORTABLE THERMOCOUPLE ATTACHMENT UNIT. CONTRACTOR SHALL ARRANGE SUFFICIENT NUMBER OF THERMOCOUPLE ATTACHMENT UNITS.

4.8.2.2
CONTRACTOR SHOULD PROVIDE TEMPERATURE INDICATOR / TEMPERATURE RECORDER FOR MEASURING TEMPERATURE DURING PRE-HEATING FOR WELDING OR FOR

CONTROLLING TEMPERATURE OF METAL FOR HOT CORRECTION ETC. THE TEMPERATURE RECORDERS SHOULD BE PREFERABLY OF SOLID STATE TYPE.

4.8.2.3
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.

4.8.2.4
IN CERTAIN CASES ONLY THE PRE-HEATING OF WELD JOINTS MAY BE CALLED FOR.

4.8.2.5
FOR WELD JOINTS OF HEAVY STRUCTURAL SECTIONS, IF HEAT TREATMENT IS REQUIRED, THE SAME SHALL BE CARRIED OUT AS PART OF THE WORK.

4.8.2.6
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.

4.8.2.7
ALL THE RECORDED GRAPHS FOR HEAT TREATMENT SHALL BE HANDED OVER TO BHEL/ CLIENT AND DUE CLEARANCES OBTAINED.

4.8.3 NON DESTRUCTIVE EXAMINATION :

4.8.3.1
CONTRACTOR SHALL PROVIDE ALL RESOURCES AND MAKE ALL ARRANGEMENTS FOR THE RADIOGRAPHIC EXAMINATION OF WELDS FOR THIS WORK. FOR REASONS OF SAFETY, INVARIABLY THE RADIOGRAPHY WORK WILL BE CARRIED OUT AFTER THE NORMAL WORKING HOURS AND CLOSE OF OTHER SITE ACTIVITIES ONLY. IN THIS REGARD, THE CONTRACTOR HAS TO ADHERE TO THE SAFETY RULES / REGULATIONS LAID BY BARC AUTHORITIES FROM TIME TO TIME.

4.8.3.2
RADIOGRAPHY INSPECTION OF WELDS SHALL BE PERFORMED IN ACCORDANCE WITH REQUIREMENTS AND RECOMMENDATION OF BHEL ENGINEER. THE MINIMUM QUANTUM OF RADIOGRAPHIC INSPECTION SHALL BE AS PER PROVISION OF IBR/BHEL'S ERECTION DOCUMENTS. THEY MAY, HOWEVER BE INCREASED DEPENDING UPON THE PERFORMANCE OF THE INDIVIDUAL WELDER AT THE DISCRETION OF BHEL ENGINEER/CLIENT.

4.8.3.4
ALL X-RAY / GAMMA RAY FILMS OF WELD JOINTS SHALL BE PRESERVED PROPERLY AND BE HANDED OVER TO BHEL/ CLIENT AND REQUISITE CLEARANCES SHALL BE OBTAINED BY THE CONTRACTOR.

4.8.3.5
THE FIELD WELDED JOINTS SHALL BE SUBJECT TO DYE-PENETRANT/MPT/RT/ OTHER NON-DESTRUCTIVE EXAMINATION AS SPECIFIED IN THE RESPECTIVE ENGINEERING DOCUMENTS/ AS INSTRUCTED BY BHEL.

4.8.3.6
WHERE REQUIRED, SURFACE PREPARATION, LIKE SMOOTH GRINDING OF WELDED AREA, PRIOR TO RADIOGRAPHY SHALL BE DONE. IT MAY ALSO BECOME NECESSARY TO ADOPT INTER-LAYER NDE 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 IN HIS OFFER. THE REQUIRED NDT METHOD/PROCEDURE WILL BE DECIDED BY BHEL ENGINEER AT SITE.

4.8.3.7
TENDERER SHALL NOTE THAT 100% RADIOGRAPHY WILL BE TAKEN ON ALL PIPING 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.

4.8.3.8
RADIOGRAPHY SHOTS TO BE TAKEN BY DOUBLE WALL TECHNIQUE OR ANY OTHER METHOD TO BE ADOPTED IN CONSULTATION WITH BHEL ENGINEER AT SITE.

4.8.3.9
NO SEPARATE PAYMENT FOR ANY NDE ACTIVITIESIS ENVISAGED.

4.9 TESTS, TRIALS, PRE-COMMISSIONING & COMMISSIONING ETC

4.9.1
COMMISSIONING OF THE STG AND AUXILIARIES WILL BRIEFLY & GENERALLY INVOLVE THE FOLLOWING TESTS AND ACTIVITIES OF THE EQUIPMENTS ERECTED :

(i) TRIAL RUN OF FEED PUMPS, CEP, AND VARIOUS ROTATING MACHINERIES / PUMPS.
(ii) TRIAL RUN OF MOTORS/ DRIVES FOR VARIOUS AUXILIARIES.
(iii) HYDRAULIC TEST OF PIPELINES, CLOSED SYSTEMS, TANKS AND VESSELS.
(iv) FLUSHING OF ALL PIPELINES BY AIR/OIL/WATER/STEAM AS THE CASE MAY BE.
(v) SERVICING OF ALL VALVES AND FITTINGS.
(vi) MANUAL/MECHANICAL CLEANING OF OIL TANKS, DE-AERATOR, FST, SUCTION STRAINERS / FILTER ELEMENTS OF CEP, BFP, BOOSTER PUMP AND OTHER VARIOUS EQUIPMENTS AND TANKS ERECTED BY THE CONTRACTOR. THIS MAY HAVE TO BE REPEATED SEVERAL TIMES DURING THE COMMISSIONING PROCESS.
(vii) CHEMICAL CLEANING OF PIPING SYSTEMS, DEAERATOR AND FST AS PER REQUIREMENT. CONTRACTOR SHALL CARRY OUT DISASSEMBLY AND REASSEMBLY OF VULNERABLE COMPONENTS LIKE DEAERATOR SPRAY NOZZLES, GAUGES, INSTRUMENTS ETC. AS INSTRUCTED BY BHEL DURING THIS PROCESS.
(viii) PUTTING TURBINE ON BARRING GEAR.
(ix) ROLLING AND SYNCHRONISATION.
(x) FULL LOAD OPERATION.
(xi) TRIAL OPERATION

THE ABOVE LIST IS ONLY INDICATIVE AND OTHER TESTS/ TRIALS AS INDICATED DURING ERECTION & COMMISSIONING TO DEMONSTRATE THE COMPLETION OF ANY PART OR PARTS OF WORK PERFORMED BY THE CONTRACTOR HAVE TO BE PERFORMED. THESE ACTIVITIES/TESTS/TRIAL RUNS MAY HAVE TO BE REPEATED TILL SATISFACTORY RESULTS ARE OBTAINED AND ALSO TO MEET THE TECHNICAL AND STATUTORY REQUIREMENTS.

4.9.2
THE TESTING, TRIALS & PRE-COMMISSIONING ACTIVITIES WILL START AT APPROPRIATE STAGE OF MECHANICAL COMPLETION OF VARIOUS EQUIPMENTS AND SHALL CONTINUE TILL THE UNIT IS HANDED OVER. SIMULTANEOUS ACTIVITIES LIKE CHECKING OF EQUIPMENTS ERECTED, PREPARING FOR TRIAL RUNS, FILLING UP OF LUBRICANTS,

CHEMICALS, TRIAL RUN OF VARIOUS EQUIPMENT ETC WILL BE IN PROGRESS IN VARIOUS AREAS. ALL THESE WORKS NEED SPECIALISED CREW OF WORKMEN INCLUDING ELECTRICIANS, INSTRUMENT TECHNICIANS, FITTERS, IN EACH AREA TO RENDER ASSISTANCE TO BHEL COMMISSIONING STAFF. CONTRACTOR SHALL EARMARK SEPARATE MANPOWER IN ADEQUATE STRENGTH AND PROPERLY QUALIFIED/SKILLED FOR SUCH ACTIVITIES. THIS MANPOWER SHALL NOT BE DISTURBED OR DIVERTED. FURTHER, THESE WORKMEN MAY BE REQUIRED TO WORK ON EXTENDED HOURS AND ON ROUND THE CLOCK BASIS ALONG WITH BHEL ENGINEERS.

4.9.3
CONTRACTOR SHALL LAY TEMPORARY PIPELINES WITH FITTINGS AND ACCESSORIES ETC. AS INSTRUCTED BY BHEL ENGINEER FOR THE PURPOSE OF TESTING, PRE-COMMISSIONING AND COMMISSIONING ACTIVITIES LIKE HYDRAULIC TESTING, CHEMICAL CLEANING, OIL FLUSHING, STEAM BLOWING ETC. OF PIPING AND OTHER EQUIPMENTS AS PART OF THE SCOPE OF WORK. TEMPORARY INSTALLATIONS SHALL BE SUBJECT TO NECESSARY TESTING, NDE ETC AND DISMANTLED AFTER USE BY THE CONTRACTOR AND RETURNED TO BHEL STORES AS SPECIFIED ELSEWHERE IN THIS T.S.

4.9.4
THE CONTRACTOR SHALL PROVIDE ALL ASSISTANCE, TO BHEL AND THEIR TESTING & COMMISSIONING AGENCY, FOR THE TESTING AND COMMISSIONING OF ELECTRICAL AND INSTRUMENTATION PARTS OF EQUIPMENTS COVERED UNDER THIS SCOPE OF WORK.

4.9.5
IN CASE DURING VARIOUS STAGES OF THE TESTING/TRIALS/ PRE-COMMISSIONING OF EQUIPMENT COVERED HEREIN, ANY DEFECT IS NOTICED NECESSITATING REPAIR/ RECTIFICATION/ REWORK/ REPLACEMENT THEN CONTRACTOR ATTEND THE SAME EXPEDITIOUSLY AND PROMPTLY. CONTRACTOR'S CLAIM IF ANY, FOR SUCH REPAIR/RECTIFICATION/REWORK/ REPLACEMENT ETC WILL BE GOVERNED BY CLAUSES 13.1 TO 13.8 OF THE SPECIFICATION PROVIDED THE CAUSE OF SUCH WORK IS NOT ATTRIBUTABLE TO THE CONTRACTOR. THE PARTS TO BE REPLACED SHALL HOWEVER, BE PROVIDED BY BHEL FREE OF COST.

4.9.6

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

ii) SIMILARLY, DURING THE COURSE OF ERECTION, IF CERTAIN PORTION OF EQUIPMENTS ERECTED BY THE CONTRACTOR HAS TO BE UNDONE FOR ENABLING OTHER CONTRACTORS / AGENCIES OF BHEL / CUSTOMER TO CARRY OUT THEIR WORK, CONTRACTOR SHALL CARRY OUT SUCH JOBS EXPEDITIOUSLY AND PROMPTLY AND MAKE GOOD THE JOB AFTER COMPLETION OF WORK BY OTHER CONTRACTORS / AGENCIES OF BHEL / CUSTOMER AS PER BHEL ENGINEER'S / AGENCIES OF BHEL / CUSTOMERS INSTRUCTIONS. CLAIMS, IF ANY, IN THIS REGARD SHALL BE GOVERNED AS PER CLAUSES 13.1 TO 13.7.

4.9.7
DURING THESE TESTS/ TRIALS AND PRE-COMMISSIONING ACTIVITIES REPLACING/ CHANGING MECHANICAL/OTHER SEALS OF EQUIPMENT, PUMPS, OPENING OF VALVES, CHANGING OF GASKETS, CHECKING, REALIGNING OF ROTATING AND OTHER EQUIPMENT, ATTENDING TO LEAKAGES IN PIPING, TANKS ETC. AND ADJUSTMENTS OF ERECTED EQUIPMENT MAY ARISE. VALVES SHALL BE SERVICED AND LUBRICATED TO THE SATISFACTION OF BHEL ENGINEER DURING THE ERECTION AND COMMISSIONING AS PER BHEL ENGINEER'S INSTRUCTIONS.

4.9.8

THE CONTRACTOR SHALL CARRY OUT AIR TIGHTNESS TEST ON GENERATOR GAS COOLING SYSTEM AND WATER FLUSHING OF PRIMARY WATER SYSTEM TO THE SATISFACTION OF BHEL ENGINEER.

4.9.9
THE CONTRACTOR SHALL RENDER ALL ASSISTANCE FOR INITIAL AND SUBSEQUENT FILLINGS OF GAS IN GENERATOR GAS SYSTEM AS AND WHEN REQUIRED TILL UNIT IS HANDED OVER.

4.9.10
CLEANING OF OIL TANK AS PER INSTRUCTIONS OF BHEL ENGINEER BEFORE AND AFTER OIL FLUSHING IS RESPONSIBILITY OF CONTRACTOR.

4.9.11
DURING THIS PERIOD, THOUGH BHEL'S AND CUSTOMER'S ENGINEERS WILL ALSO BE ASSOCIATED IN THE WORK, THE CONTRACTOR'S RESPONSIBILITY WILL BE TO MAKE AVAILABLE RESOURCES IN HIS SCOPE TILL SUCH TIME THE COMMISSIONED UNITS ARE TAKEN OVER BY THE CUSTOMER.

4.9.12
IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE FOR NECESSARY RESOURCES TILL THE COMPLETION OF WORK UNDER THESE SPECIFICATION, EVEN IN CASE THE WORK GETS DELAYED DUE TO REASONS NOT ATTRIBUTABLE TO THE CONTRACTOR.

4.9.13
CONTRACTOR SHALL INSTALL BOTH PERMANENT AND TEMPORARY CONNECTING PIPING FOR OIL PURIFICATION EQUIPMENTS. FURTHER, ALL OPERATIONS FOR CLEANING, OIL PURIFICATION/ FLUSHING, DISMANTLING OF TEMPORARY PIPING DURING PRE AND POST-COMMISSIONING OF EQUIPMENT UPTO FULL LOAD SHALL BE DONE AS PART OF WORK.

4.10 SPECIFIC INCLUSIONS

4.10.1
SERVICING AND ASSEMBLY OF CONTROL VALVES/REGULATING VALVES, FIXING OF FILTER ELEMENTS/STRAINERS & STEAM BLOWING & BLANKING DEVICES IN LP BYPASS, M.S. STRAINER, HRH STRAINER & AND BLANKING OF LP BYPASS, ESV & IV SYSTEM, FOR HYDRO TEST, STEAM BLOWING ETC IS THE PART OF SCOPE OF WORK.

4.10.2
COMPLETE CONTROL FLUID SYSTEM OF BOTH HP AND LP BYPASS SYSTEM IS INCLUDED IN THIS SPECIFICATION. ASSOCIATED ASSISTANCE FOR COMMISSIONING LIKE LUBE OIL FLUSHING, FILLING AND TOPPING UP OF LUBE OIL ETC SHALL BE PART OF THE WORK.

4.10.3
ASSEMBLY AND INSTALLATION OF STRAINER ELEMENTS OF MS AND HRH SYSTEM IS WITHIN THE SCOPE OF WORK. CLEANING OF THESE STRAINER ELEMENTS DURING TRIAL OPERATION OF MACHINE IS ALSO COVERED UNDER THIS SCOPE.

4.10.4
CHIPPING OF FOUNDATION, PLACEMENT, ERECTION, ALIGNMENT, COMMISSIONING, GROUTING, MOUNTING OF EQUIPMENT MOUNT INSTRUMENTS, PANELS AND OTHER FITTINGS OF BHEL (PEM BOUGHT OUT ITEMS) SUPPLIED PUMPS & PACKAGES ARE IN SCOPE OF THE WORK. ERECTION AND COMMISSIONING OF THESE EQUIPMENTS/PUMPS & PACKAGES WILL BE REQUIRED TO COMPLETE TO MEET THE COMMISSIONING SCHEDULE/ MILESTONE ACTIVITIES OF OTHER AREAS LIKE BOILER, DM WATER TREATMENT PLANT, ASH HANDLING PLANT, SERVICE WATER REQUIREMENT, FUEL OIL HANDLING PLANT ETC. CONTRACTOR SHALL PLAN AND COMPLETE ERECTION & COMMISSIONING OF THESE

EQUIPMENTS ON PRIORITY AS PER DECISION OF BHEL ENGINEER/CUSTOMER REQUIREMENT. INDICATIVE DETAILS OF SUCH SYSTEMS ARE FURNISHED IN APPENDIX-I.

4.10.5

ELECTRICALLY OPERATED TRAVELLING (E.O.T.) AND HAND OPERATED TRAVELLING (H.O.T.) CRANES AND OTHER LIFTING EQUIPMENTS ALONG WITH ASSOCIATED ITEMS LIKE CHAIN PULLEY BLOCKS, ELECTRICAL HOISTS AND SIMILAR LIFTING EQUIPMENTS ARE ALSO INCLUDED UNDER THE SCOPE OF THIS TENDER SPECIFICATION. THESE EQUIPMENTS HAVE TO BE INSTALLED AT DIFFERENT LOCATIONS AND ELEVATIONS DETAILS OF WHICH WILL BE PROVIDED DURING THE COURSE OF WORK. THESE SCOPE OF WORKS IN THIS REGARD SHALL INCLUDE THE FOLLOWING:-

a) HANDLING AT STORES & STORAGE YARD & TAKING OVER DELIVERY FROM BHEL OF COMPONENTS OF THE CRANES & OTHER LIFTING EQUIPMENTS AND ALSO THE TEST LOAD ETC.
b) TRANSPORTATION TO SITE OF WORK INCLUDING VIA PRE-ASSEMBLY YARD, IF NEEDED.
c) PRE-ERECTION CKECKS, PRE-ASSEMBLY IF NEEDED.
d) ERECTION, ALIGNMENT, WELDING, BOLTING, FASTENING OF ALL COMPONENTS OF THE CRANES/LIFTING EQUIPMETNS INCLUDING ELECTRIC BUS BARS/ TRAILING CABLES, PENDANTS ETC.
e) DRY RUN TEST AT NO LOAD.
f) LOAD TESTS AT DIFFERENT LOADS AS ADVISED BY BHEL AT SITE.
g) OVER LOAD TEST AT DESIGNATED LOAD AS REQUIRED.
h) RETURN OF SURPLUS COMPONENTS, TEST LOADS ETC TO BHEL STORES WITH DUE RECONCILIATION.

PRIORITY OF E&C OF THESE EQUIPMENTS SHALL BE AS PER INSTRUCTION OF BHEL AT SITE AND DECISION OF BHEL SITE INCHARGE AT SITE SHALL BE FINAL AND BINDING ON CONTRACTOR.

4.11 EXCLUSIONS

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

ALL PIPING EXCEPT INTEGRAL PIPING OF STG- TG & AUX SET.

ALL CABLE CONNECTIONS, EXCEPT THOSE SPECIFIED AS SCOPE OF WORK.

ALL CONTROL & INSTRUMENTATION WORK THAN OTHERWISE SPECIFIED HEREIN.

ERECTION, TESTING AND COMMISSIONING OF ELECTRICAL PANELS AND STARTING RESISTORS FOR DC JOP AND DC EOP PUMPS, PANELS OF OIL PURIFICATION UNIT LUBE OIL SYSTEM.

ERECTION, TESTING AND COMMISSIONING OF ELECTRICAL PANELS AND STARTING RESISTORS OF SEAL OIL, PRIMARY WATER, GAS SYSTEMS.

ELECTRICAL TESTING OF MOTORS (EXCEPT THOSE SPECIFIED HEREIN), TURBO-GENERATOR. HOWEVER ERECTION THESE WILL BE UNDER THE SCOPE OF THIS TENDER SPECIFICATION.

IMPULSE PIPING AND FITTINGS FROM THE TAPPING POINTS OF VARIOUS EQUIPMENT OTHER THAN THOSE SPECIFIED AS SCOPE OF WORK.

CIVIL WORKS TO THE EXTENT NOT SPECIFICALLY PROVIDED FOR IN THIS TENDER.

THERMAL INSULATION OF TURBINE, ESV, IV, LPBP VALVES.

FINAL PAINTING.

4.12

IT MAY BE SPECIFICALLY NOTED THAT IT SHOULD NOT BE CONSTRUED OR CLAIMED BY THE CONTRACTOR THAT WITH THE TECHNICAL SPECIFICATION AND "EXCLUSIONS AND/OR INCLUSIONS" DETAILED IN THIS TENDER SPECIFICATION, BHEL HAS COVERED THE ENTIRE SCOPE OF WORK AND/OR THE DETAILS THEREOF TO BE EXECUTED BY THE CONTRACTOR.

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
(A) FOR THE PURPOSE OF HANDLING AND ERECTION OF GENERATOR STATOR BHEL WILL PROVIDE FREE-RETURNABLE BASIS PORTAL GANTRY CRANE OF 360 T CAP. PORTAL GANTRY CRANE WILL BE ISSUED IN PARTS / COMPONENTS AND ARE TO BE ASSEMBLED AT SITE BY THE CONTRACTOR AS PER THE INSTRUCTIONS OF BHEL ENGINEERS / ERECTION MANUAL.

(B) THE SCOPE INCLUDES TAKING DELIVERY OF THE MATERIALS FROM BHEL STORES, TRANSPORTATION TO SITE, SERVICING OF THE COMPONENTS / DRIVES / PULLEYS ETC, CHECKING AND LUBRICATING WIRE ROPES , PRE ASSEMBLY AND ASSEMBLY OF COMPONENTS, PREPARATION OF FOUNDATION, ERECTION OF CRANE ON THE FOUNDATION, GROUTING OF CRANE BASE PLATES, CABLING, PRE-COMMISSIONING AND COMMISSIONING OF DRIVES, LOAD TESTING , CHECKING OF OVER-LOAD PROTECTION , REGULAR MAINTENANCE ETC. SPARES REQUIRED, IF ANY, FOR THE SAME WILL BE PROVIDED BY BHEL AS FREE ISSUE.

(C) AFTER ERECTION OF THE GENERATOR STATOR, THE CONTRACTOR SHALL DISMANTLE THE CRANE IN SEQUENCE AS INSTRUCTED BY BHEL AND APPLY

PRESERVATIVES / TOUCH-UP PAINTS , WHEREVER REQUIRED AND RETURN THE SAME TO BHEL STORES/YARDS IN GOOD CONDITION. NECESSARY CONSUMABLES , TOOLS AND PLANTS INCLUDING GAS, WELDING M/C ETC. ARE TO BE PROVIDED BY THE CONTRACTOR.

(D) CONTRACTOR SHALL PROVIDE EXPERIENCED CREW FOR ENTIRE OPERATION.

(E) THERE IS NO SEPARATE RATE FOR THE ABOVE AND QUOTED RATES SHALL BE INCLUSIVE OF THIS.

(F) ASSIST CRANE REQUIRED OUTSIDE TG HALL, IF ANY, FOR ABOVE ACTIVITIES WILL BE PROVIDED BY BHEL ON SHARING BASIS, HOWEVER, OPERATOR AND FUEL CHARGES HAVE TO BE BORN BY THE CONTRACTOR AS PER DECISION OF BHEL ENGINEER.

5.2.3
BHEL WILL PROVIDE ON SHARING BASIS ITS CRAWLER CRANE AS LISTED IN RELEVANT APPENDIX FOR LIFTING THE COMPONENTS OF FST AND DEAERATOR 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 DEAERATOR AND FST SHELL COMPONENTS, AS PER BHEL ENGINEER'S DECISION.

5.2.6
CONTRACTOR SHALL PROVIDE THE COMPLETE OPERATING CREW LIKE OPERATOR, HELPERS FOR EOT CRANE.

5.2.7 NOT USED

5.2.8
CONTRACTOR HAS TO ARRANGE SLINGS OF ALL SIZES FOR COMPLETING THE WORKS COVERED UNDER THESE SPECIFICATIONS EXCEPT THE SPECIAL SLINGS FOR GENERATOR STATOR LIFTING/HANDLING, WHICH WILL BE PROVIDED BY BHEL FREE OF CHARGES ON RETURNABLE BASIS.

5.2.9
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.

5.2.10
CONTRACTOR'S RESPONSIBILITIES WITH REGARD TO OPERATOR, FUEL, LUBRICANTS AND DAILY UPKEEP OF T&P PROVIDED BY BHEL IS FURTHER DETAILED IN SECTION-7.

5.2.11
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.

5.2.12
COMPLETE SET OF HYDRAULIC JACKS OF 50 TONNES AND 100 TONNES CAPACITY SHALL BE ARRANGED BY THE CONTRACTOR FOR USE DURING ERECTION AND COMMISSIONING OF TURBINE. ALSO, HYDRAULIC JACKS OF 100 TONNES AND 63 TONNES CAPACITY ALONG WITH LONG HIGH PRESSURE HOSES OF SUITABLE LENGTH FOR GENERATOR ERECTION AND ALIGNMENT SHALL BE ARRANGED BY THE CONTRACTOR. THESE JACKS SHALL BE OF REPUTED MAKE, HIGHLY RELIABLE AND MAINTAINED IN EXCELLENT WORKING CONDITION. THEY SHALL BE TESTED FOR SAFE WORKING BEFORE DEPLOYING IN ACTUAL WORK. SINCE THESE JACKS ARE MEANT FOR SPECIFIC USES THESE MAY BE USED AS FAR AS POSSIBLE ONLY IN STEAM-TURBINE / GENERATOR AREA.

5.2.13
ALL JACK BOLTS THAT ARE REQUIRED DURING ERECTION FOR CARRYING OUT ROLL-CHECK ETC. WILL HAVE TO BE ARRANGED BY THE CONTRACTOR. NO JACK BOLTS WILL BE PROVIDED BY BHEL.

5.2.14
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.

5.2.15
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.

5.2.16
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.

5.2.17
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.

5.2.18
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.

TG SPECIAL CONSUMABLES LIKE HYLOMAR / GOLDEN HERMETITE / STAG-B / MOLYKOTE/ ANABOND COMPOUNDS / RUBBER FIXING COMPOUNDS ETC WILL HAVE TO BE ARRANGED BY THE CONTRACTOR.

5.3.2
ALL CONSUMABLES TO BE USED FOR THE WORK SHALL HAVE PRIOR APPROVAL OF BHEL ENGINEER WITH REGARD TO BRAND AND QUALITY SPECIFICATIONS. TEST REPORTS / CERTIFICATES IN RESPECT OF THESE CONSUMABLES, WHEREVER APPLICABLE, SHALL BE SUBMITTED TO BHEL ENGINEER.

5.3.3 PRIMERS & PAINTS

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

5.4 WELDING ELECTRODES, FILLER WIRES FOR TIG WELDING AND GASES

5.4.1
ALL WELDING CONSUMABLES INCLUDING FILLER WIRES IS IN THE CONTRACTOR'S SCOPE.

5.4.2
ALL THE REQUIRED WELDING ELECTRODES AS APPROVED BY BHEL SHALL BE ARRANGED BY CONTRACTOR AT HIS COST. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN PRIOR APPROVAL OF BHEL, BEFORE PROCUREMENT, REGARDING MANUFACTURER, TYPE OF ELECTRODES ETC. ON RECEIPT OF THE ELECTRODES AT SITE, IT SHALL BE SUBJECT TO INSPECTION AND APPROVAL BY BHEL REGARDING TYPE OF ELECTRODES, BATCH NUMBER, DATE OF EXPIRY ETC. BATCH TEST CERTIFICATES SHALL BE MADE AVAILABLE FOR VERIFICATION & RECORD BEFORE THE ACTUAL USE OF THE WELDING CONSUMABLES.

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

5.4.3
THE CONTRACTOR SHALL PROVIDE ALL CONSUMABLES REQUIRED FOR CARRYING OUT THE WORK COVERED UNDER THIS SCOPE OF WORK INCLUDING TIG WIRES FOR WELDING OF PIPING JOINTS.

5.4.4

ALL THE REQUIRED GASES LIKE ARGON, OXYGEN, ACETYLENE ETC INCLUDING REQUIRED HIGH PURITY NITROGEN GAS (FOR PURGING OF GENERATOR STATOR WATER SYSTEM) SHALL BE ARRANGED BY THE CONTRACTOR AT HIS COST.

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 INCRESED AT SITE.

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

HOWEVER, SERVICES ON SHARING BASIS OF EOT CRANE AND PORTAL GANTRY CRANE FOR THE PURPOSES IDENTIFIED IN 'APPENDIX-IV' WILL BE AVAILABLE INSIDE THE TG HALL AS AND WHEN THESE T&P ARE SPAREABLE/AVAILABLE AT THE DISCRETION OF BHEL.

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.

6.7

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.

6.8 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:

A) OVERALL PLANNING, MONITORING & CONTROL
B) QUALITY CONTROL AND QUALITY ASSURANCE
C) MATERIALS MANAGEMENT
D) SAFETY, FIRE & SECURITY
E) 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 LABOUR COLONY, 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 SITE QUALIFICATION TEST PIPE WELDERS:
BHEL WILL PROVIDE ONLY THE TUBES/PIPES FREE OF CHARGES FOR PREPARATION OF TEST PIECES FOR CONDUCTING THE SITE QUALIFICATION TEST OF ONLY THE PIPE WELDERS. CONTRACTOR SHALL PREPARE THE REQUIRED TEST PIECES FROM SUCH RAW MATERIALS. FOR SITE QUALIFICATION TEST OF ALL OTHER WELDERS CONTRACTOR SHALL ARRANGE ALL THE MATERIALS AND PREPARE TEST COUPONS.

7.2 FILLER WIRE FOR TIG WELDING

REFER SECTION-5 IN THIS REGARD.

7.3 EQUIPMENTS – TOOLS & PLANTS

BHEL WILL MAKE AVAILABLE T&P LISTED VIDE **APPENDIX-III** 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 **APPENDIX–III**) FREE OF CHARGE TO THE CONTRACTOR ON SHARING BASIS MAINLY FOR THE PURPOSES NOTED THEREIN VIDE REMARKS. THE ALLOCATION OF CRANES SHALL BE THE DISCRETION OF BHEL ENGINEER, WHICH SHALL BE BINDING ON THE CONTRACTOR.

7.3.1.2
CONTRACTOR SHALL LAY NECESSARY SLEEPER BEDS, BACKFILLING OF APPROACHES WHEREVER NECESSARY FOR SAFE MOVEMENT OF THE BHEL'S CRAWLER CRANE AS DIRECTED BY BHEL. NECESSARY SLEEPERS HAVE TO BE PROVIDED BY THE CONTRACTOR.

7.3.1.3
BHEL T&P WILL BE ISSUED IN BASIC ASSEMBLED CONDITION AND ANY BOOM REDUCTION/ EXTENSION OF BHEL CRANES FOR CONTRACTOR'S USE AND RESTORATION TO PREVIOUS STATE OR AS DIRECTED BY BHEL SHALL BE THE CONTRACTOR'S RESPONSIBILITY. CONTRACTOR SHALL PROVIDE ALL ENABLING SERVICES WITH TOOLS AND TACKLES FOR ASSEMBLY/DISMANTLING AND BOOM EXTENSION/REDUCTION AS ABOVE.

7.3.1.4
EOT CRANE OF CUSTOMER WILL BE PROVIDED FREE OF CHARGE FOR ACTIVITIES OF HANDLING & ERECTION WITHIN TG HALL. EOT CRANE IN TG HALL WILL BE ISSUED ON NEED BASIS AND IS TO BE SHARED WITH OTHER CONTRACTORS. QUALIFIED &

EXPERIENCED OPERATORS ARE TO BE PROVIDED BY THE CONTRACTOR ON FULL TIME BASIS.

7.3.1.5
PORTAL GANTRY CRANE WILL BE PROVIDED FOR HANDLING AND LIFTING OF GENERATOR STATOR BY BHEL. FOR FURTHER DETAILS REFER RELEVANT PROVISIONS OF SECTION-5.

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
SPECIAL TOOLS WHICH ARE SUPPLIED BY BHEL AS PART OF MAINTENANCE TOOLS TO BE HANDED OVER TO CUSTOMER UNDER REGULAR DU / DESS NUMBERS/ PACKAGES 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.

7.4.3
THE CONTRACTOR MUST NOT USE THESE EQUIPMENTS FOR ANY PURPOSE OTHER THAN WHAT THEY ARE INTENDED FOR.

7.4.4
IF THE ABOVE ITEMS ISSUED TO CONTRACTOR ARE FOUND NOT UTILISED / NOT MAINTAINED TO THE SATISFACTION OF BHEL ENGINEER OR MISUSED, THESE WILL BE WITHDRAWN AND NO REPLACEMENT WILL BE DONE FOR SUCH ITEMS.

7.4.5
REQUIRED TEMPORARY STRUCTURAL STEEL, PIPES & FITTINGS, VALVES FOR CONDUCTING HYDRAULIC TEST, CHEMICAL CLEANING / STEAM BLOWING / OIL FLUSHING / ACID CLEANING ETC SHALL BE PROVIDED BY BHEL ON RETURNABLE BASIS.

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

7.5.1
ALL LUBRICANTS, GASES AND CHEMICALS REQUIRED FOR TESTING, PRESERVATION, CHEMICAL CLEANING / ACID CLEANING, OIL/CHEMICAL/GAS FLUSHING, AND THE LUBRICANTS FOR INITIAL FILL AND TOPPING UP FOR TRIAL RUN OF THE EQUIPMENT AND TRIAL OPERATION OF THE UNIT WILL BE SUPPLIED BY BHEL FREE OF CHARGES. CARBON-DIOXIDE AND HYDROGEN GAS FOR PURGING AND FILLING IN TURBO-GENERATOR WILL ALSO BE SUPPLIED BY BHEL. CONTRACTOR SHALL COLLECT THESE LUBRICANTS FROM STORES, HANDLE AND CARRY OUT FILLING/POURING AS PER REQUIREMENT. EXCESS/ USED LUBRICANTS AND EMPTY CONTAINERS/BARRELS SHALL BE RETURNED FOLLOWING DUE PROCESS OF ACCOUNTING/RECONCILIATION.

SECTION-8

SPECIAL CONDITIONS OF CONTRACT

INSPECTION / QUALITY ASSURANCE / QUALITY CONTROL / STATUTORY INSPECTION

8.1

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

8.2

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

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

8.3

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

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

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

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

8.4

In the course of erection, it may become necessary to carry repeated checks of the work with instruments recently calibrated, re-calibrated. Such

instruments whenever necessary, will be provided by BHEL, on returnable basis, on specific authorisation by BHEL Engineer.

8.5

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

8.6

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

8.7 STAGE INSPECTION BY FES / QA ENGINEERS

8.7.1

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

8.7.2

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

STATUTORY INSPECTION.

8.8.1

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

8.8.2

All fees connected with the contractors for testing his welders / men / workers and testing, inspection, calibrating of his instruments and

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

8.9

BHEL, Power Sector – Western Region (PSWR) has already been accredited with ISO 9002 certification and as such this work is subject to various audits to meet ISO 9002 requirements. One particular aspect which needs special mention is about arrangement of calibration of instruments by the contractor. Contractor shall ensure deployment of reliable and calibrated MMD (instrument measuring and test equipment). The MMD shall have test / calibration certificates from authorised / government approved / accredited agencies traceable to national / international standards. Re-testing / re-calibration shall also be arranged at regular intervals during the period of use as advised by BHEL Engineer within the contract price. The contractor will also have alternate arrangements for such MMD so that work does not suffer when the particular equipment / instrument is sent for calibration. Also if any MMD not found fit for use, BHEL shall have the right to stop the use of such item and instruct the contractor to deploy proper item and recall i.e. Repeat the readings taken by that instrument, failing which BHEL may deploy MMD and retake the readings at contractor's cost.

Section-9

Special Conditions of Contract

Safety, Occupational Health and Environmental Management

BHEL PSWR has been certified for Environmental Management under ISO 14001:1996 standard and Occupational Health & Safety under OHSAS 18001 by DNV. In order to comply with the above standards, it shall be the endeavour of BHEL and all its subcontractors to meet and implement the requirements by following the guidelines issued under Environmental, Occupational Health and Safety Management (EHS) manual a copy of which will be available with the BHEL Site-in-charge.

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

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

9.1 The Contractor shall:

9.1.1

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

9.1.2

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

9.1.3

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

9.1.4

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

9.1.5

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

i) Name of Contractor
ii) Name of Contractor Site-in-charge & Telephone number
iii) Job Description in short
iv) Date of start of job

v) Date of expected completion
vi) Name of BHEL Site-in-charge.

9.1.6
Abide by the rules and regulations existing during the contract period as applicable for the contractors at the Project premises.

9.1.7
Observe the timings of work as advised by BHEL Engineer-in-charge for carrying out the contract work.

9.2 SPECIAL CONDITIONS

9.2.1 Safety

9.2.1.1 Safety Plan

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

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

9.2.1.2
The contractor shall take all necessary safety precautions and arrange for appropriate appliances and/or as per direction of BHEL or it's authorized person to prevent loss of human lives, injuries to men engaged and damage to property and environment.

9.2.1.3
The contractor shall provide to his work force and also ensure the use of Personnel Protection Equipment (PPE) as found necessary and/or as directed and advised by BHEL officials without which permission is liable to be denied.

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

9.2.1.4
All tools, tackles, lifting appliances, material handling equipment, scaffolds, cradles, cages, safety nets, ladders, equipment, etc used by the contractor shall be of safe design and construction. These shall be tested and certificate of fitness obtained before putting them to use and from time to time as instructed by authorized BHEL official who shall have the right to ban the use of any item found to be unsafe.

9.2.1.5
All electrical equipment, connections and wiring for construction power, its distribution and use shall conform to the requirements of Indian Electricity Act and Rules. Only electricians licensed by the appropriate statutory authority shall be employed by the contractor to carryout all types of electrical works. All electrical appliances including

portable electric tools used by the contractor shall have safe plugging system to source of power and be appropriately earthed.

9.2.1.6
The contractor shall not use any hand lamp energized by electric power with supply voltage of more than 24 volts. For work in confined spaces, lighting shall be arranged with power source of not more than 24 volts.

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

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

9.2.1.9
Proper means of access must be used e.g. ladders, scaffolds, platforms etc. No makeshift access such as oil drums or pallets shall be used. Design of these will be in accordance with relevant standards and certified by competent persons before use.

9.2.1.10
Temporary arrangements made at Site for lifting , platforms, approach access etc should be properly designed and approved before being put to use.

9.2.1.11
All excavations and openings must be securely and adequately fenced/barricaded and warning signs erected when considered necessary as per relevant code of practice.

9.2.1.12
No persons shall remove guardrails, covers or protective devices unless authorized by a responsible supervisor and alternative precautions have been taken

9.2.1.13
Access ways, means of escape and fire exits shall be clearly marked, kept clear and unobstructed at all times

9.2.1.14
Only authorized persons holding relevant license will drive and operate site plant and equipments e.g. cranes, dumpers, excavators, transport vehicles etc

9.2.1.15
Only authorized personnel are allowed to repair, commission electrical equipments.

9.2.1.16
Gas Cylinders shall be handled and stored as per Gas Cylinders Rules and relevant safe working practices

9.2.1.17
All wastes generated at Site shall be segregated and collected in a designated place so as to prevent spillage/contamination/scattering at Site, until the waste is lifted for disposal to designated disposal area as advised by BHEL official.

9.2.1.18
The contractor shall arrange at his cost (wherever not specified) appropriate illumination at all work spots for safe working when natural day light is not adequate for clear visibility.

9.2.1.19
The contractor shall train adequate number of workers/supervisors for administering "FIRST AID". List of competent first aid administers should be prominently displayed.

9.2.1.20
The contractor shall display at strategic places and in adequate numbers the following in fluorescent markings

- Emergency telephone numbers
- Exit, Walkways
- Safe working load charts for wire ropes, slings, D shackles etc
- Warning signs

9.2.1.21
The contractor shall be held responsible for any violation of statutory regulations (local, state or central) and BHEL instructions that may endanger safety of men, equipment, material and environment in his scope of work or other contractors or agencies. Cost of damage, if any, to life and property arising out of such violation of statutory regulations and BHEL instructions shall be borne by the contractor.

9.2.1.22
In case of a fatal or disabling injury/accident to any person at construction sites due to lapses by the contractor, the victim and/or his/her dependents shall be compensated by the contractor as per statutory requirements. However, if considered necessary, BHEL shall have the right to impose appropriate financial penalty on the contractor and recover the same from payments due to the contractor for suitably compensating the victim and/or his/her dependents. Before imposing any such penalty, appropriate enquiry shall be held by BHEL giving opportunity to the contractor to present his case.

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

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

9.2.1.25
If the contractor fails to improve the standards of safety in its operation to the satisfaction of BHEL after being given a reasonable opportunity to do so, and/or if

the contractor fails to take appropriate safety precautions or to provide necessary safety devices and equipment or to carry out instructions regarding safety issued by the authorized BHEL official, BHEL shall have the right to take corrective steps at the risk and cost of the contractor after giving a notice of not less than seven days indicating the steps that would be taken by BHEL.

9.2.1.26 **Emergency Response**

BHEL will have an Emergency Response Plan for each Project Site in consultation with the Owner as the case may be, detailing the procedure for mobilization of personnel and equipment, and defining the responsibilities of the personnel indicated, in order to prepare for any emergency that may arise in order to ensure the priorities of

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

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

9.2.1.27
At least 5% Contractors supervisors and workmen shall undergo training in administering 'First Aid'. The trained persons should represent for all categories of work and for all areas of work. Adequate number of trained persons should be available for each shift. These first aides shall be included in the emergency response team. Contractor employees and workmen are encouraged to participate in first aid training programmes whenever organized by BHEL.

9.2.2 OCCUPATIONAL HEALTH

9.2.2.1
Specific occupational health hazards will be identified through the hazard evaluation processes in consultation with BHEL engineers and the necessary prevention/reduction/elimination methods implemented.

9.2.2.2
All personnel working in an activity with a potential risk to health shall be made aware of all those risks and the actions they must take to reduce/control/eliminate the risk

9.2.2.3
Safety coordinator shall conduct periodic checks to ensure that every group of workers engaged in similar activities are aware of potential risks to health and the actions required to be taken to mitigate the risk

9.2.2.4
In order to protect personnel from associated health hazards, the following main areas will be focused

- Issue of approved Personnel Protective Equipment
- Verification that the PPE are adequate/maintained and worn by all staff involved in operations that are potentially hazardous to their health

- Ensure that the personnel deployed are physically fit for the operation/work concerned
- Provide hygienic and sanitary working conditions

9.2.2.5
Contractor workers employees engaged in noise risk areas shall be issued with hearing protection aids and the use of the same will be enforced. Further, these workers will be educated on the hazards of noise

9.2.2.6
Contractor workers engaged in dust environment shall be issued with necessary dust protection aids and the use of the same shall be enforced

9.2.2.7
Workers engaged in exposure to bright light/rays as in welding or radiation shall be issued with eye protection devices and the use of the same shall be enforced

9.2.2.8
Adequate arrangements shall be made to provide safe drinking water

9.2.2.9
Health monitoring records on at least sample basis for contractor employees & workmen shall be maintained for persons engaged in specified categories of work. These shall include

- Noise induced hearing loss
- Lung Function test
- Ergonomic Test
- Eye Test for Welders, Grinders, Drivers etc

9.2.3.0 HYGIENE and HOUSEKEEPING

9.2.3.1
Good house keeping and proper hygiene is one of the key requirements of Occupational Health Safety and Environment management. Towards this the contractor shall encourage his workers and supervisors to maintain cleanliness in their area of work.

9.2.3.2
The Contractor shall arrange to place waste bins/chutes at convenient locations for the collection of scrap and other wastes. The bins shall be clearly marked and segregated for metal, non-metal, hazardous and non hazardous wastes.

9.2.3.3
BHEL may take up appropriate remedial measures at the cost of the contractors if the contractors fail in good house keeping and if there is an imminent risk of pollution

9.2.4 ENVIRONMENT MANAGEMENT

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

objectives for their minimization. The contractors shall implement the objectives for continual improvement of environmental performance. BHEL shall regularly audit environmental impacts and their improvements.

9.2.4.2 WASTE MANAGEMENT

9.2.4.3.1
The objective of waste management is to ensure the safe and responsible disposal of waste, ensuring that it is correctly disposed of and being able to audit the process to ensure compliance.

9.2.4.3.2
Chemical wastes if any shall be collected separately and disposed of to BHEL designated refuse yard as per BHEL advice.

9.2.4.3.3
No dangerous chemicals, noxious waste products or materials will be disposed off on or off site without approval obtained through BHEL.

9.2.4.3.4
All disposal of wastes generated during construction shall be in accordance with all relevant legislation.

9.2.4.3.5
Acid and alkali cleaning wastes shall be neutralized to acceptable norms before disposal to the designated area.

9.2.4.3.6
All necessary measures shall be taken to ensure safe collection and disposal of waste oils. In particular to ensure the prevention of their discharge into surface waters, ground waters, coastal waters or drainages

9.3 SUPERVISION

9.3.1

Contractor must provide at least one full time on site safety coordinator when the manpower engaged is in excess of 50 for the contract activities in the premises. If the manpower is less than 50, the on site safety coordination responsibilities shall be assumed by any one of the contractor's other supervisory staff; however in both the cases, the contractor must specify in writing the name of such persons to the BHEL Engineer in Charge.

9.3.2

Contractor's safety coordinator or his supervisor responsible for safety as the case may be shall conduct at his work site, and document formal safety inspection and audits at least once in a week. Such documents are to be submitted to BHEL Engineer in Charge for his review and record.

Contractor, supervisor must attend all schedule safety meetings as would be intimated to him by the BHEL Engineer in Charge.

9.3.3

Before starting work under any contract, the contractor must ensure that a job specific safety procedures/field practices as required over and above the safety permit conditions are prepared and followed .He should also ensure that all supervisors and workers involved understand and follow this procedures /field practices.

9.3.4
Contractor must ensure that in his work site appropriate display boards are put displaying signs for site safety, potential hazards and precautions required.

9.4.0 **TRAINING & AWARENESS**

9.4.1

Contractor shall deploy experienced supervisors and other manpower who are well conversant with the safety and environment regulations of the Project. The electricians to be deployed on the job should have wireman license.

9.4.2
All Supervisors & Workmen of the Contractor shall undergo Fire safety training/ demonstration whenever arranged by BHEL with the help of either Customer's Fire and Safety department or outside faculty so as to acquire knowledge of fire prevention and also to be able to make use of appropriate fire extinguishers.

9.4.3
Contractor must familiarize himself from BHEL Engineer in Charge about all known potential fire, explosion or toxic release hazards related to the contract. He in turn will ensure that same information has been passed to the supervisors and workmen

9.4.4
Contractor must ensure that all his supervisors are properly trained and each employee has received and understood from his supervisor necessary training and briefing about the safety requirement. Necessary document as a means to verify that employees have understood the training is to be maintained.

9.4.5
The contractor supervisors shall also give a small safety briefing to all the workmen under his charge before undertaking any new work and specially understand the safety requirements that are mandatory

9.5.0 **REPORTING**

9.5.1
The contractor shall submit report of all accidents, fires and property damage, dangerous occurrences to the authorized BHEL official immediately after such occurrence but in any case not later than twelve hours of the occurrence. Such report shall be furnished in the manner prescribed by BHEL and also to meet statutory requirement.

9.5.2
Any injury sustained by any of the contractor's employees within the Project premises must be reported to BHEL supervisor and FIRST AID should be immediately administered. The Contractor shall be responsible for keeping and maintaining proper records of Accidents to his personnel.

9.5.3
Contractor must arrange to immediately investigate, properly document and report any injury, accident or near miss involving any of his employees and take appropriate follow up action. He must furnish within 12 hours of the incident a written report to BHEL Engineer in charge and the Safety Section.

9.5.4
According to the Factory Act and the Employees state Insurance Act & regulation, any person sustaining any injury within the project premises and absenting himself from work for more than 46 hours, his accident report has to be sent to the respective Government Authorities. Therefore contractor shall inform the owner's representative such matter immediately for their needful action.

9.5.5
In addition, contractor shall submit periodic reports on safety to the authorised BHEL official from time to time as prescribed.

9.5.6
Before commencing the work, the contractor shall appoint/nominate a responsible officer to supervise implementation of all safety measures and liaison with his counterpart of BHEL.

9.6 **AUDIT REVIEW AND INSPECTION**

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

9.6.2
Inspections shall be carried out regularly by the contractors and by BHEL Engineers on activities, facilities, equipment, 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	User	Daily

		tool		
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 Slinging property	200/-
07.	Using Damaged Sling	200/-
08.	Lifting Cylinders Without Cage	500/-
09.	Not Using Proper Welding Cable With Lot of Joints And Not Insulated Property.	200/-
10.	Not Removing Small Scrap From Platforms	200/-
11.	Gas Cutting Without Taking Proper Precaution or Not Using Sheet Below Gas Cutting	200/-
12.	Not Maintaining Electric Winches Which are Operated Dangerously	500/-
13.	Improper Earthing Of Electrical T&P	500/-
	Major Accident or Accidents causing partial loss of earning to the victim	50,000/- per victim
14	Fatal Accident or Accidents causing permanent loss of earning to the victim	1,00,000/- per victim

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

9.8
CITATION:-If safety record of the contractor in execution of the awarded job is to the satisfaction of safety department of BHEL, issue of an appropriate certificate to recognize the safety performance of the contractor may be considered by BHEL after completion of the job

9.9 Memorandum of Understanding

After Award Of Work, Contractors Are Required To Enter Into A Memorandum Of Understanding As Given Below:

Memorandum of Understanding

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

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

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

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

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

Name :

Place & Date:

9.10

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

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

IS No	YEAR	Amd upto	DESCRIPTION
IS 11972	1987		CODE OF PRACTICE FOR SAFETY PRECAUTION TO BE TAKEN WHEN ENTERING A SEWARAGE SYSTEM
IS 1287	1986		ELECTRIC TOASTER
IS 13063	1991		STRUCTURAL SAFETY OF BUILDINGS ON SHALLOW FOUNDATIONS ON ROCKS
IS 13385	1992		SPECIFICATIONS FOR FIRE EXTINGUISHERS 50 LITRE WHEEL MOUNTED WATER TYPE (GAS CARTRIDGES)
IS 13386	1992		SPECIFICATIONS FOR FIRE EXTINGUISHERS 50 LITRE MECHANICAL FOAM TYPE
IS 13415	1992		CODE OF SAFETY FOR PROTECTIVE BARRIERS IN AND AROUND BUILDINGS
IS 13416	1992		RECOMMENDATIONS FOR PREVENTIVE MEASURES AGAINST HAZARDS AT WORKING PLACE PART 1 TO PART 5
IS 13430	1992		CODE OF PRACTICE FOR SAFETY DURING ADDITIONAL CONSTRUCTION AND ALTERATION TO EXISTING BUILDINGS
IS 13849	1993		PORTABLE FIRE EXTINGUISHERS DRY POWDER TYPE (CONSTANT PRESSURE)
IS 1446	1985		CLASSIFICATION OF DANGEROUS GOODS (FIRST REVISION)
IS 1476	1979		REFRIGERATORS
IS 1641	1988		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS (GENERAL): GENERAL PRINCIPLES OF FIRE GRADING AND CLASSIFICATION
IS 1642	1989		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS-DETAILS OF CONSTRUCTION
IS 1643	1988		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS (GENERAL): EXPOSURE HAZARD
IS 1646	1997		CODE OF PRACTICE FOR FIRE SAFETY OF BUILDINGS (GENERAL): ELECTRICAL INSTALLATIONS
IS 1904	1986		CODE OF PRACTICE FOR DESIGN AND CONSTRUCTION OF FOUNDATIONS IN SOIL
IS 1905	1987		STRUCTURAL SAFETY OF BUILDINGS MASONARY WALLS
IS 2082	1985		ELECTRICAL GEYSERS
IS 2171	1985		PORTABLE FIRE EXTINGUISHERS DRY POWDER TYPE (CARTRIDGE)
IS 2309	1989		PRACTICE FOR THE PROTECTION OF BUILDINGS AND ALLIED BUILDINGS AGAINST LIGHTENING
IS 2312	1967		EXHAUST FANS
IS 2361	1994		SPECIFICATION FOR BUILDING GRIPS - FIRST REVISION
IS 2418	1977		TUBULAR FLUORSCENT LAMPS IS 2418 (FT-1)
IS 2750	1964		STEEL SCAFFOLDINGS
IS 2762	1964		SAFE WORKING LOADS IN KGS FOR WIRE ROPE SLINGS
IS 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

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

SECTION-10

Special Conditions of Contract

10.0 Drawings And Documents

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

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

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

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

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

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

10.7
In case of discrepancy between quoted item rate and corresponding amount in the rate schedule, the **quoted item rates shall be reckoned as correct and amount recalculated**. Quoted item rates shall also prevail for arriving at the total price quoted for offer evaluation.

10.8
Bank Guarantees to be furnished by the Contractor towards Security Deposit and Performance Guarantee (Last 5% payment against Workmanship Warranty/Defect Liability) shall have a claim period of six months over and above the validity period required for the case.

SECTION-11

SPECIAL CONDITIONS OF CONTRACT

TIME SCHEDULE, MOBILIZATION, PROGRESS MONITORING, OVERRUN, VARIATION ETC.

TIME SCHEDULE & MOBILIZATION

11.1.1

THE CONTRACTOR SHALL COMPLETE INITIAL MOBILIZATION SO AS TO START THE CONTRACTUAL WORK WITHIN ONE MONTH FROM THE DATE OF ISSUE OF FAX LETTER OF INTENT OR AS PER ADVISE OF CONSTRUCTION MANAGER OF BHEL. FURTHER MOBILIZATION SHALL BE DONE IN SUCH A MANNER THAT THE ENTIRE WORK IS COMPLETED TO ACHIEVE THE FOLLOWING MILESTONE SCHEDULE:

ACTIVITY	**SCHEDULE OF COMPLETION (#)**
TURBINE BOX UP	12^{TH} MONTH
COMPLETION OF OIL FLUSHING	13^{TH} MONTH
BARRING GEAR	15^{TH} MONTH
SYNCHRONISATION & COAL FIRING	18^{TH} MONTH
TRIAL OPERATION COMPLETION	20^{TH} MONTH
COMPLETION OF ALL FACILITIES	22^{ND} MONTH

- INDICATES THE NO.OF MONTHS FROM THE START OF ERECTION.

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

11.2 START OF CONTRACT PERIOD AND DURATION.

THE TOTAL CONTRACT PERIOD FOR COMPLETION OF ENTIRE WORK SHALL BE **22 (TWENTY TWO)** MONTHS FROM THE START OF ERECTION. START OF ERECTION SHALL BE RECKONED FROM THE DATE WHEN A MAJOR ACTIVITY OF ERECTION AND/OR ASSEMBLY OF ANY EQUIPMENT/ PART IS STARTED AS DIRECTED BY BHEL ENGINEER. THE WORK OF PACKER MATCHING AND PLACEMENT OF PACKER PLATES, INSERT PLATES, ETC. WILL NOT BE CONSIDERED FOR THIS PURPOSE.

11.3 GRACE PERIOD

GRACE PERIOD OF 4 (FOUR) MONTHS BEYOND THE CONTRACT PERIOD OF **22 (TWENTY TWO)** MONTHS IS PROVIDED FOR THIS CONTRACT. HOWEVER, ALL MILESTONE EVENTS AS PER ACTUAL REQUIREMENT OF PROJECT SCHEDULE SHALL HAVE TO BE ACHIEVED BY THE CONTRACTOR WITHOUT TAKING RECOURSE TO THE GRACE PERIOD.

11.4 PROGRESS MONITORING, CONTRACT EXTENSION AND OVER RUN

11.4.1 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.

11.4.2 ASCERTAINING AND ESTABLISHING THE REASONS FOR SHORTFALL

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

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.

11.5 CONTRACT EXTENSION

11.5.1
IF THE COMPLETION OF WORK AS DETAILED IN THESE SPECIFICATION GETS DELAYED BEYOND THE END OF CONTRACT PERIOD AND GRACE PERIOD THEN DEPENDING ON THE BALANCE WORK LEFT OUT, BHEL AT ITS DISCRETION MAY EXTEND THE CONTRACT.

11.5.2
A JOINT PROGRAMME SHALL BE DRAWN FOR THE WORK TO BE COMPLETED DURING THE EXTENDED CONTRACT PERIOD. REVIEW OF THE PROGRAM AND RECORD OF SHORTFALL AS DESCRIBE VIDE CLAUSE 11.2.2 SHALL BE DONE DURING THE EXTENDED PERIOD. THE 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 THE PERFORMANCE, THE AGREED PLAN SHALL BE REDUCED BY SHORTFALL ATTRIBUTABLE TO THE BHEL). BHEL MAY DISALLOW CONTRACTOR'S CLAIM FOR OVER RUN CHARGES, IF THE MONTHLY PROGRAMME AS MENTIONED HERE NOT MADE BY HIM.

11.5.3
THE PART OF EXTENSION ATTRIBUTABLE TO THE CONTRACTOR, IF ANY, IN TOTAL CONTRACT EXTENSION SHALL BE EXHAUSTED FIRST I.E. IMMEDIATELY AFTER END OF GRACE PERIOD. THIS SHALL BE FOLLOWED BY THE EXTENSION ON ACCOUNT OF FORCE MAJEURE CONDITIONS, IF ANY, AND LASTLY ON ACCOUNT OF BHEL.

11.6 OVERRUN COMPENSATION
IF THE CONTRACT IS EXTENDED BEYOND THE END OF CONTRACT PERIOD 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. 50,000/- PER MONTH (RUPEES FIFTY THOUSAND ONLY).** OVERRUN COMPENSATION WILL BE PAID FOR THE EXTENSION ATTRIBUTABLE TO BHEL ONLY. NO OVERRUN COMPENSATION WILL BE PAYABLE FOR THE EXTENSION ON ACCOUNT OF REASONS ATTRIBUTABLE TO CONTRACTOR AND / OR FORCE MAJEURE CONDITIONS.

11.7 PRICE VARIATION

11.7.1
THE 90% COMPONENT OF THE PRICE QUOTED SHALL BE PERMITTED TO BE ADJUSTED FOR VARIATION IN LABOUR INDEX DURING EXECUTION OF WORK AS GIVEN HEREUNDER. THE REMAINING 10% SHALL BE TREATED AS FIXED COMPONENT OF PRICE.

$$P_1 = P_0 (0.10 + 0.90\ L_1 / L_0)$$

WHERE

P_1 = REVISED CONTRACT RATE/CONTRACT PRICE

P_0 = ACCEPTED CONTRACT RATE/CONTRACT PRICE

L_0 = CONSUMER PRICE INDEX FOR INDUSTRIAL WORKERS (GENERAL), APPLICABLE TO 'ALL INDIA' AS PUBLISHED BY LABOUR BUREAU, SHIMLA AS APPLICABLE TO THE CALENDAR MONTH OF THE OFFER SUBMISSION (CORRESPONDING TO FINAL DATE OF OFFER SUBMISSION INCLUDING EXTENSION THEREOF, IF ANY).

L_1 = CONSUMER PRICE INDEX FOR INDUSTRIAL WORKERS (GENERAL), APPLICABLE TO 'ALL INDIA' AS PUBLISHED BY LABOUR BUREAU, SHIMLA AS APPLICABLE TO THE CALENDAR MONTH OF THE OFFER SUBMISSION (CORRESPONDING TO FINAL DATE OF OFFER SUBMISSION INCLUDING EXTENSION THEREOF, IF ANY).

11.7.2

PAYMENT/RECOVERY DUE TO VARIATION IN INDEX/PRICES SHALL BE DETERMINED ON THE BASIS OF THE ABOVE NOTIONAL FORMULA WITHOUT ANY INITIAL ABSORPTION.

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 OVER RUN CHARGES, MAN-DAY RATE FOR EXTRA WORKS ETC.

SIMILARLY, PRICE VARIATION WILL NOT BE APPLICABLE FOR THE RESPECTIVE % OF ITEM RATE ASSIGNED FOR THE COMMISSIONING ACTIVITIES IDENTIFIED UNDER THE HEADING "PRE-COMMISSIONING & COMMISSIONING" / "COMMISSIONING" IN PAYMENT BREAK-UP TABLE ENVISAGED HEREIN.

WITH THE ABOVE PROVISION, THE CLAUSE NO. 2.15 OF GENERAL CONDITIONS OF CONTRACT SECTION-2 IS NOT APPLICABLE.

11.7.3
THE CONTRACTOR SHALL FURNISH NECESSARY 'MONTHLY BULLETINS' ISSUED BY LABOUR BUREAU, SHIMLA AND RBI BULLETINS FOR ALL COMMODITIES.

11.7.4
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,

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.

11.8 CONTRACT VARIATIONS

11.8.1 VARIATION IN QUANTITY

QUANTITY & WEIGHT OF VARIOUS EQUIPMENTS AND ITEMS OF WORK COVERED UNDER THE TENDER SPECIFICATION ARE LIKELY TO VARY. FOR ANY UPWARD OR DOWNWARD VARIATION IN QUANTITIES AS WELL AS WEIGHT IN RESPECT OF TG & AUXILIARIES UNDER ITEM SL. NO.1 OF RATE SCHEDULE, THE ACCEPTED PRICE SHALL REMAIN FIRM.

IN CASE OF E.O.T./ H.O.T. CRANES AND OTHER LIFTING EQUIPMENTS THAT ARE INCLUDED UNDER THE TENDER SPECIFICATION AND UNDER SL.NO.2 OF RATE SCHEDULE, THE PAYMENT SHALL BE MADE BASED ON ACTUAL QUANTITY (MT) EXECUTED. ACCEPTED RATE SHALL REMAIN FIRM IRRESPECTIVE OF ANY UPWARD OR DOWNWARD VARIATION IN QUANTITIES.

11.9 INTEREST BEARING RECOVERABLE ADVANCE

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

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

11.10 DEFINITION OF WORK COMPLETION

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

SECTION-12

SPECIAL CONDITIONS OF CONTRACT

12.0 TERMS OF PAYMENT

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

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

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

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

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

12.0.5
BHEL will release payment through Electronic Fund Transfer (EFT)/RTGS. In order to implement this system, the following details are to be furnished by the Contractor pertaining to his Bank Accounts where proceeds will be transferred through BHEL's banker:

1. Name of the Company
2. Name of Bank
3. Name of Bank Branch
4. City/Place
5. Account Number
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 SL. NO. 01 OF RATE SCHEDULE – ST-TG SET AND AUXILIARIES INCLUDING PEM SUPPLIED BOIs (EXCEPT HOISTS & CRANES):

12.1.1.1
THE ACCEPTED PRICE WILL BE PROGRESSIVELY RELEASED UNDER FOLLOWING MAJOR HEADS OF WORK. THESE HEADS ARE NOT INTENDED TO DEFINE OR TO LIMIT THE SCOPE OF WORK; IT IS GIVEN ONLY TO FACILITATE PROGRESSIVE RELEASE OF PAYMENTS TO THE CONTRACTOR. ACCORDINGLY, ALL THE WORK UNDER THESE SPECIFICATIONS SHALL BE COMPLETED WITHIN QUOTED RATES. BHEL SHALL HAVE THE RIGHT TO CLASSIFY ANY EQUIPMENT UNDER APPROPRIATE WORK HEAD AS DEEMED FIT AND SAME SHALL BE FINAL & BINDING ON THE CONTRACTOR.

12.1.1.2
CONTRACTOR SHALL, IN CONSULTATION WITH AND ON APPROVAL OF BHEL ENGINEER AT SITE, MAKE DETAILED BILLING BREAK-UP FOR FURTHER USE.

SL. NO.	MAJOR WORK HEADS	PERCENTAGE OF ACCEPTED PRICE
A	*ALL ACTIVITIES UPTO READINESS FOR PRE-COMMISSIONING ACTIVITIES OF THE SET*	*90%*
1.0	CONDENSER INCLUDING MAIN CCW PIPING+RE JOINTS & B/F VALVES AT CONDENSER INLET & OUTLET	25 %
2.0	STEAM TURBINE AND ALL AUXILIARIES	15 %
3.0	TURBO GENERATOR AND ALL AUXILIARIES	12%
4.0	DRIVE TURBINES INCLUDING LUB OIL SYSTEM ETC, ALL PUMPS AND AUXILIARIES	10 %
5.0	TG INTEGRAL PIPING	8 %
6.0	HEAT EXCHANGERS INCLUDING FST & DE-AERATOR, ALL TANKS AND VESSELS	10%
7.0	ALL OTHER EQUIPMENTS INCLUDING PEM SUPPLIED BOIs (EXCEPT HOISTS & CRANES)	10%
B	*PRE-COMMISSIONING & COMMISSIONING*	*10%*
1	OIL FLUSHING OF LUBE OIL, SEAL OIL AND CONTROL FLUID SYSTEM	2.0%
2	COMMISSIONING OF MD- BFP & TD-BFP, CEP ETC	2.0%
	COMMISSIONING OF PEM SUPPLIED BOIs (EXCEPT HOISTS & CRANES)	2.0%
3	STEAM BLOWING AND BARRING GEAR	1.0%
4	STEAM ROLLING AND OVER-SPEED TEST	1.0%
5	SYNCHRONISATION	1.0%

SL. NO.	MAJOR WORK HEADS	PERCENTAGE OF ACCEPTED PRICE
6	TRIAL OPERATION COMPLETION	1.0%

12.1.2 FOR SL. NO. 02 OF RATE SCHEDULE – E.O.T. & H.O.T. CRANES, CHAIN PULLEY BLOCKS AND MISCELLANEOUS PERMANENT LIFTING EQUIPMENTS:

PROGRESSIVE PRO-RATA PAYMENT OF 100% OF ITEM RATE WILL RELEASED AS PER FOLLOWING BREAK-UP

SL. NO.	DESCRIPTION (STAGE OF COMPLETION)	PERCENTAGE OF ACCEPTED RATE
1	PLACEMENT IN POSITION AND ALIGNMENT	80
2	COMMISSIONING AND DRY RUN TEST ETC	10
3	LOAD TEST & OVERLOAD TEST	10
TOTAL		*100*

12.2 MEASUREMENT OF THE WORK COMPLETED

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

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

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

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

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

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

G) NO SEPARATE PAYMENT WILL BE MADE FOR THE WEIGHT/VOLUME OF LUBRICANT, OILS, CHEMICALS, GASES, WATER, PRESERVATIVES ETC.

H) NO PAYMENT WILL BE MADE FOR THE SPECIAL TOOLS OR TEST WEIGHTS ETC. USED FOR ERECTION & TESTING IN VARIOUS ACTIVITIES OF THIS WORK.

SECTION-13

SPECIAL CONDITIONS OF CONTRACT

EXTRA CHARGES FOR MODIFICATION AND RECTIFICATION

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

13.2
It may also be noted that if any such said extra works arise on account of contractor's own fault, it will have to be carried out by the contractor free of cost. Under such circumstances, any material and consumable required for this purpose, will also have to be arranged by the contractor at his cost.

13.3
However, BHEL may consider for payment as extra on man-day basis, for such of those activities detailed in clause 13.1 which require more than 100 man-hours and such payment will be regulated by the terms, conditions and stipulations contained in the clauses contained hereinafter. It may be specifically noted that the decision of BHEL as to whether such payment is due shall be final and binding on the contractor.

13.4
Extra works should be done by a separately identifiable gang, without affecting routine activities. Daily log sheets in the proforma prescribed by BHEL should be maintained and shall be signed by the contractor's representative and BHEL engineer. No claim for extra work will be considered / entertained in the absence of the said supporting documents i.e. daily man-hour log sheets. It may, however, be noted that signing of log sheets by BHEL engineer does not mean the acceptance of such works as payable extra works.

13.5
Such extra works arising out of transit, storage and erection damages, payment, if found due, will be regulated as per section-14.

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

13.7
BHEL may, at their absolute discretion, consider for payment, as extra on man-day basis as found by them as justifiable for such of those works specified in clause no. 13.1 which require major modification / repair / rework / rectification etc. It may also be noted that only those works which are identified as major and warrant extra payment and certified as such by BHEL site engineer, accepted by the designers, and / or competent authority of BHEL will be considered for extra payment.

13.8
After eligibility of extra works is established and finally accepted by BHEL engineer / designer, payment will be released on competent authority's approval at the following rate.

MAN HOUR RATE FOR ELIGIBLE EXTRA WORKS

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

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

SECTION-14
SPECIAL CONDITIONS OF CONTRACT
INSURANCE

SPECIAL CONDITIONS OF CONTRACT

14.0 Insurance

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

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

14.2 Reporting Damages and Carrying out Repairs

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

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

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

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

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

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

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

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

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

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

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

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

14.3 Insurance by the Contractor and Indemnification of BHEL

14.3.1

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

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

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

SECTION-15

SPECIAL CONDITION OF CONTRACT

15.0 EARNEST MONEY DEPOSIT & SECURITY DEPOSIT

15.1 EARNEST MONEY DEPOSIT:

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

ONE TIME EMD WILL ALSO BE Rs. 2 LACS.

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

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

I) AFTER OPENING THE TENDER, THE TENDERER REVOKES HIS TENDER WITHIN THE VALIDITY PERIOD OR INCREASES HIS EARLIER QUOTED RATES.

II) THE TENDERER DOES NOT COMMENCE THE WORK WITHIN THE PERIOD AS PER LOI / CONTRACT. IN CASE THE LOI / CONTRACT IS SILENT IN THIS REGARD THEN WITHIN 15 DAYS AFTER AWARD OF CONTRACT.

EMD SHALL NOT CARRY ANY INTEREST.

15.2 SECURITY DEPOSIT

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

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

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

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

I) CASH (AS PERMISSIBLE UNDER THE INCOME TAX ACT)

II) PAY ORDER, DEMAND DRAFT IN FAVOUR OF BHEL.

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

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

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

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

FIXED DEPOSIT RECEIPT ISSUED BY SCHEDULED BANKS / PUBLIC FINANCIAL INSTITUTIONS AS DEFINED IN THE COMPANIES ACT. THE FDR SHOULD BE IN THE NAME OF THE CONTRACTOR, A/C BHEL, DULY DISCHARGED ON THE BACK.

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

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

THE SECURITY DEPOSIT SHALL NOT CARRY ANY INTEREST.

NOTE: ACCEPTANCE OF SECURITY DEPOSIT AGAINST SL. NO. (IV) AND (VI) ABOVE WILL BE SUBJECT TO HYPOTHECATION OR ENDORSEMENT ON THE DOCUMENTS IN FAVOUR OF BHEL. HOWEVER, BHEL WILL NOT BE LIABLE OR RESPONSIBLE IN ANY MANNER FOR THE COLLECTION OF INTEREST OR RENEWAL OF THE DOCUMENTS OR IN ANY OTHER MATTER CONNECTED THEREWITH.

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

APPENDIX – I

WEIGHT SCHEDULE

Sl.No.	EQUIPMENT / PACKAGE	APPROX. WT. (in MT)
A	STEAM TURBINE & AUX.	900.00
B.	TURBO GENERATOR & AUX.	535.00
C.	HEAT EXCHANGERS	830.00
D.	PUMPS, TURBO DRIVE & MOTORS	265.00
E.	BOUGHT OUT ITEMS (BHEL Hardwar Scope)	400.00
F.	TANKS & VESSELS	40.00
G.	TG INTEGRAL PIPING	95.00
H.	BOUGHT OUT ITEMS (BHEL PEM Scope)	98.00
I.	E.O.T./H.O.T. Cranes, Chain Pulley Blocks and Misc. Permanent Lifting Equipments	10.00
K.	MAIN COOLING WATER PIPING – CONDENSER INLET AND OUTLET WITH B/F VALVES	192
	TOTAL WT.	**3365**

NOTE :

The weight indicated above is approximate and there may be a variation in weight of equipment / package. No claim, whatsoever, will be entertained by BHEL on account of variation in weight and or quantities.

APPENDIX – II

TENTATIVE LIST OF PACKAGES, ODC DETAILS, WEIGHTS ETC.,

SN	DESCRIPTION	PACKAGE SIZE IN MM	GROSS WT. IN KG.
A.	**STEAM TURBINE :**		
	HP TURBINE	5660 X 3100 X 2880	86500
	IP ROTOR	6650 X 2700 X 2600	27483
	IP OUTTER CASING U/H	3610 X 5400 X 2600	26000
	IP OUTER CASING L / H	3610 X 5400 X 2600	26000
	IP INNER CASING U/H	3200 X 2850 X 1800	14900
	IP INNER CASING U/H	3200 X 2850 X 1800	14900
	LP ROTOR	8735 X 3800 X 4170	89800
	LP FRONT WALL (TS)	8760 X 3850 X 1150	18305
	LP FRONT WALL (TS)	8760 X 3850 X 1150	18305
	LP OUTER CASING (UH-TS)	9000 X 2187 X 3460	15523
	LP OUTER CASING (UH – GS)	9000 X 2187 X 3460	15523
	LONGITUDINAL GIRDER RIGHT	8200 X 1680 X 1950	21412
	LONGITUDINAL GIRDER LEFT	8200 X 1680 X 1950	21412
	LPC INNER – OUTER UPPER HALF	8640 x 3630 x 2500	42035
	LPC INNER CASING ASSY (LH)	9100 x 3890 x 3180	53035
	LPC INNER CASING ASSY. (UH)	4550 x 1790 x 2270	12857
	IV & CV CASING WITH VALVE	5040 x 4690 x 2770	33276
	IV & CV CASING WITH VALVE	5040 x 4690 x 2770	33276
	ESV & CV CASING WITH VALVE	3600 x 3190 x 2500	23070
	ESV & CV CASING WITH VALVE	3600 x 3190 x 2500	23070
	MAIN OIL TANK.	6120 x 3120 x 2650	11800

SN	DESCRIPTION	PACKAGE SIZE IN MM	GROSS WT. IN KG.
B:	**GENERATOR :**		
	STATOR	8830 x 4100 x 4120	275146
	ROTOR WITH TOOLS & TACKLES	1400 x 1850 x 1750	73159
	END SHIELD LOWER HALF (TE)	6200 x 2350 x 2670	31123
	END SHIELD UPPER HALF (TE)	6165 x 2050 x 2650	28342
	END SHIELD LOWER HALF (EE)	4900 x1500 x 2490	12487
	GENERATOR BRGS. (2 NOS.)	1250 x 1150 x 1250	3006
	MANHOLE COVERS (20 NOS.)	1240 x 1240 x 1040	1312
	BAFFLE RING / CRR & AIR GAP SEAL.	1682 x 1688 x 1095	347
	TERMINAL BSHNG. (6 NOS.)	220 x 1830 x 610	1427
	HV TERMINAL BOX	3700 x 2560 x 1950	10473
	SEAL RING HOLD INNER & OUTER OIL CATCHER	2140 x 1140 x 840	1560
	BLOWER BFL. RING	1920 x 1920 x 1340	1762
	GEN. END SHIELD FEET EE & TE (2 NOS. EACH)	1940 x 1550 x 980	3464
	PRIMARY WATER TANK	7860 x 1820 x 1140	3771
	PIPING ON GEN. FOR PW TANK	6800 x 2100 x 1200	1101
	FOUNDATION PLATES	2895 x 760 x 840	3030
	ANCHOR BOLTS.	2740 x 655 x 600	1485
	CHANNELS, ANGLES, PIPES & STUDS.	5800 x 1120 x 520	1558

SN	DESCRIPTION	PACKAGE SIZE IN MM	GROSS WT. IN KG.
	ROTOR & GENERAL ASSLY. DEVICES.	2460 x 1170 x 1240	2952
	HYDRAULIC UNIT	1340 x 840x 1380	798
	GEN. ERECTION DEVICES.	2550 x 1180 x 1140	1701
	ERECTION DEVICE / FOUNDATION ITEM	1640 x 1140 x 1240	2781
	END SHIELD UPPER HALF (EE)	4400 x 1365 x 2490	8743
	GEN. ACCESSORIES (PW PIPELINE)	4000 x 1000 x 850	749
	CONN. PIECE ASSLY.	1100 x 850 x 350	837
	GEN. ACCESSORIERS	3000 x 1000 x 900	265
	COOLER AIR VENT ASSLY.	Any convenient size	101
	PLATEFORM FOR PW TANK	4000 x 1000 X 900	1141
	B'LESS EXCITER SET	5750 X2350X 3400	32928
	B'LESS EXCITER COVERS	4400 X 3400 X 3100	4478
	B'LESS EXCITER REAR COVERS	4400 X 3400 X 3100	4978
	EXCITER ACCESS & RACK ASSLY	3900 X 1250 X 1150	3631
	EXC. BED PLATE ACCESSORIES	5800 X 1140 X 1240	2909
	EXC. ACCESSORIES	1440 X 940 X 1220	1253
	EXC. BED PLATE ACCESSORIES	1000 X 800 X 800	775
	RR WHEEL AIR GUIDE COVER	2800 X 1500 X 2000	1572
	SEAL OIL STORAGE TANK	3700 X 1400 X 1260	1532
	PW PUMP AND FILTER UNIT	3450X 2750 X 2315	5294
	MEASURING INSTRUMENT RACK	1550 X 910 X 1715	831
	SEAL OIL MOTOR PUMP UNIT	330 X 1740 X 1340	3035
	SEAL OIL UNIT	3100 X 3000 X 3400	7890
	SEAL OIL VALVE RACK	2700 X 1140 X 2440	7078
	GAS UNIT	1980 X 1610 X 2420	1209
	CO_2 VAPOURISER	1520 X 840 X 840	250
	H_2 DISTRIBUTOR	3480 X 1540 X 440	352
	CO_2 DISTRIBUTOR	4860 X 1240 X 440	360
	N_2 DISTRIBUTOR	1400 X 1240 X 440	147
	GEN. SYSTEM INTEGRAL PIPING	6600 X 600 X 600	2242
	GEN. PIPING PLAN SECTIONS	4000 X 1700 X 1950	2576
	GEN. SYSTEM INTEGRAL PIPING	7600 X 1000 X 900	3542
	GEN. SYSTEM INTEGRAL PIPING.	7600 X 1500 X 1200	6820
	FLANGE FOR GEN – PIPING.	2500 X 1500 X 100	1496
	GEN. PIPING PLAN AND SECTIONS	4800 X 1700 X 1950	4239
	GEN. PIPING PLANS AND SECTIONS	2500 X 1115 X 1000	3799
	SYSTEM MISC. ITEMS	2300 X 1520 X 550	733
	RESINS	1200 X 600 X 600	100
	ALKALYSER UNIT	2000 X 940 X 2550	492
	GEN. SYSTEM INTEGRAL PIPING.	6500 X 1500 X 800	3398
	FOUNDATION FITTINGS	790 X 1030 X 1200	230
	LOOSE ITEMS (MECH.)	SUITABLE PACKAGE	180
	BOI ITEMS		300

SN	DESCRIPTION	PACKAGE SIZE IN MM	GROSS WT. IN KG.
C:	**HEAT EXCHANGERS** **I) CONDENSER**		

SN	DESCRIPTION	PACKAGE SIZE IN MM	GROSS WT. IN KG.
	HOTWELL (FRONT HALF)	7325 X 2480 X 1690	7000
	HOTWELL (REAR HALF)	7600 X 3300 X 1850	7500
	BOTTOM PLATE (FRONT END)	8760 X 3750 X 725	8500
	BOTTOM PLATE (REAR END)	8760 X 3800 X 725	8500
	MIDDLE BOTTOM PLATE (PART – I)	8760 X 1050 X 725	8300
	MIDDLE BOTTOM PLATE (PART – II)	8760 X 3400 X 725	8300
	FRONT WATER CHAMBER (LHS)	7044 X 4469 X 540	11750
	FRONT WATER CHAMBER (TS)	4250 X 4469 X 540	11750
	FRONT WATER BOX (GEN. SIDE)	7645 X 4460 X 2640	32634
	FRONT WATER BOX (TUR. SIDE)	7645 X 4460 X 2495	32634
	REAR WATER BOX (GEN. SIDE)	6655 X 4460 X 2495	21511
	REAR WATER BOX (TUR. SIDE)	6655 X 4460 X2495	21511
	REAR WATER CHAMBER (GEN. SIDE)	7044 X 4469 X 540	11750
	REAR WATER CHAMBER (TUR. SIDE)	700 X 600 X 600	11750
	TUBE SUPPORT PLATE	6490 X 4225 X 224	8700
	TUBE SUPPORT PLATE	6490 X 4225 X 224	8700
	TUBE SUPPORT PLATE	6490 X 4225 X 224	8700
	TUBE SUPPORT PLATE	6490 X 4225 X 224	8700
	TUBE SUPPORT PLATE	6490 X 4225 X 224	8700
	TUBE SUPPORT PLATE	6490 X 4225 X 224	8700
	TUBE SUPPORT PLATE	6490 X 4225 X 224	8700
	TUBE SUPPORT PLATE	6490 X 4225 X 224	8700
	TUBE SUPPORT PLATE	6490 X 4225 X 224	11000
	TUBE SUPPORT PLATE	6490 X 4225 X 224	11000
	LOWER DOME WALL (T.S)	13132 X 4031 X 550	15850
	LOWER DOME WALL (G.S)	13132 X 4031 X 930	16200
	LOWER DOME WALL (F.W.B SIDE)	9124 X 4540 X 775	12700
	LOWER DOME WALL (R.W.B SIDE)	9124 X 4425 X 1522	15100
	UPPER DOME WALL (T.S.)	8700 X 1600 X 296	2650
	UPPER DOME WALL (G.S.)	8700 X 1600 X 296	2650
	UPPER DOME WALL (F.W.B.SIDE)	SUITABLE BOX	6110
	UPPER DOME WALL (R.W.B. SIDE)	SUITABLE BOX	6500
	DOME INTERNAL STIFFENING	SUITABLE BOXES	23950
	CONDENSER SS TUBES (LENGTH BETWEEN PLATES – 14630 mm, NUMBER OF TUBES – 24,398, OD OF TUBES – 31.75mm).	SUITABLE BOXES	176000

SL	DESCRIPTION	PACKAGE SIZE IN MM	GROSS WT. IN KG.
C:	**HEAT EXCHANGERS** **ii) HEATERS & DEAREATER**		
1.	HP HEATER 5A		44500

SL	DESCRIPTION	PACKAGE SIZE IN MM	GROSS WT. IN KG.
2.	HP HEATER 5 B		44500
3.	HP HEATER 6 A		54000
4.	HP HEATER 6B		54000
6.	LP HEATER 2		26000
7.	LP HEATER 3		18000
8.	DRAIN COOLER		5400
9.	TURBINE OIL COOLERS –2 NOS.		28000
10.	SEAL OIL COOLERS (AIR SIDE) –2 NOS.		1200
11.	SEAL OIL COOLERS (H_2 SIDE) –2 NOS.		900
12.	PRIMARY WATER COOLERS – 2 NOS.		4500
13.	HYDROGEN COOLERS - 4 NOS.		18700
14.	EXCITER AIR COOLERS –2 NOS.		4000
15.	CONTROL FLUID COOLERS- 2 NOS.		3100
	iii) FST & DEAERATOR		
1.	FST – SECTION-I		30280
2	- SECTION-II		25388
3.	- SECTION-III		31890
4.	DEAERATOR HEADER		28532

D- BFP Package details

Sl. No.	Description	Qty	Unit wt. In Kg.	Total wt. In Kg.
	Boiler Feed Pumps (MD+TDA+TDB)	3	10933	32799
	Grillage Assly. (BP+Motor)	1	3710	3710
	Grillage Assly (BFP+HC)	1	3800	3800
	BFP Skids for Mech. Seal	3	1000	3000
	Hydraulic Coupling	1	15000	15000
	R.C. Valve	3	900	2700
	Concial Type Suction Strainer	3	1200	3600
	Basket Type Suction Strainer	3	2350	7050
	Portable Oil Centrifuse	1	1000	1000
	Local Gauage Board	3	1000	3000
	Connecting Coupling (BFP & HC)	1	80	80
	Connecting Coupling (Motor & HC)	1	300	300
	Connecting Coupling (BP & Motor)	1	31	31
	Local Instrument Rack	1	200	200
	Local Gauage Board	3	1000	3000
	Local Gauage Board	3	800	2400
	Hydraulic Coupling Working Oil	1	8820	8820

E. CONDENSATE EXTRACTION PUMPS

Sl. No.	Description	Qty.	Unit wt. In Kg	Total wt. In Kg.
1	Condensate Extraction Pumps (A,B,C)	3	6220	18660

2	Canister Assly.	3	2910	8730
3	Suction Strainer Simplex	3	1500	4500
4	Connecting Coupling	3	50	150
5	Local Instrument Rack	1	250	250
6	Local Gauage Board	1	400	400
7	Local Gauage Board	1	1000	1000

F. BOOSTER PUMPS

Sl. No.	Description	Qty	Unit wt. In Kg.	Total wt. In Kg.
	Booster Pumps (MD+TDA+TDB)	3	5340	16020
	BP Skids for Mech. Seal	3	1000	3000

G. DRIVE TURBINE:

Sl. No.	Description	Qty	Unit wt. In Kg.	Total wt. In Kg.
1	Twin Oil Cooler (BFP & DT)	2	5700	11400
2	D.C. Startor Cubical	2	2000	4000
3	Assembled Drive Turbine	2	14560	29120
4	Gear Box	2	1000	2000
5	Lube Oil Console Assly - I	2	9011	18022
6	Lube Oil Console Assly. - II	2	6518	13036
7	Emergency Oil Pump	2	1700	3400
8	Jacking Oil Pump	2	175	350
9	Turbine Oil Purfication Unit	2	1450	2900
10	Oil Accumulator	2	30	60
11	Charging Kit	2	10	20
12	Centrifugal Exhaust Fan	4	75	300
13	Transfer Oil Pump	2	350	700
14	Accoustic Enclosure	2	3000	6000

H. TG-INTEGRAL PIPING ALONG WITH ASSOCIATED VALVES AND SUPPORTS

SN	**DESCRIPTION**	**WT.IN KGS**
1.	LUBE. OIL PIPING (CS & Alloy)	15000
2.	CONTROL FLUID PIPING (Stainless Steel)	17200
3.	SEAL STEAM PIPING	16000
4.	CONDENSATE SPRAY PIPING (CS & Alloy Steel)	3600
5.	TURBINE WATER DRAINAGE PIPING (CS & Alloy Steel)	13000
6.	ACW PIPING (OIL ROOM & C.F.ROOM)	5000

7.	GENERATOR INTEGRAL PIPING—SEAL OIL, P.W. PIPING AND GAS PIPING ETC.	23700

I. Flash Tanks & Vessels

Sl.NO	DESCRIPTION	PACKAGE SIZE	WT.IN KGS
1.	HP Flash Tank – 1 No.	3500 DX5600 L	7900
2.	LP Flash Tank - 1 No.	3000 DX5300 L	6600
3.	Steam Drain Flash Tank – 1 No.	2500 DX3700 L	3700
4.	Unit Flash Tank – 1 No.	1800 DX1800 L	1800
5.	Clean Oil Tank – 1 No.	6100X3500X4500	9500
6.	Dirty Oil Tank – 1 No.	6100X3500X4500	9500
7.	Oil unloading Tank – 1 No.	2300X1200X800	550
8	Feed water safety Valve Discharge Tank	1700 Dx1800 L	1800
9	ECW Overhead tank	7200Lx3000Wx2900H	6000

J. OTHER ITEMS:

1. RE JOINTS – 92 MT APPROX

2. BF VALVES – 67 MT APPROX

3. MAIN COOLING WATER PIPING AND H&S : 125 MT APPROX.

K - OTHER BOUGHT OUT (PEM) PACKAGES TO ERECTED & COMMISSIONED UNDER THIS SCOPE OF WORK.

AA)
1. PLATE HEAT EXCHANGERS (PHE)-COMPRISE OF:
A. PHE FOR TG AUX. – 3 NOS.- EACH DIMENSION 3995X1170X3082 MM & WEIGHT 8290 KG.
B) PHE FOR BOILER AUX. – 2 NOS.- EACH DIMENSION 5195X1170X3082 MM & WEIGHT 10570 KG.
2. MISCELLANEOUS PUMPS (HORIZONTAL) –COMPRISES OF :
A. ACW PUMPS SKIDS – 3 NOS.-EACH DIMENSION 2700X1300 MM & WEIGHT 5000 KG.

B. ECW TG AUX PUMPS SKIDS-3 NOS. EACH DIMENSION 2300X1100 MM & WEIGHT 1075 KG ALONG WITH NAOH DOZING SKID SUPPLIED FOR ECW SYSTEM.
C. ECW BOILER AUX. PUMPS SKIDS- 2 NOS. EACH DIMENSION 2700X1300 MM & WEIGHT 1420 KG.
3. CONDENSER ON LOAD TUBE CLEANING SYSTEM: 2 SETS COMPRISING OF:
BALL SEPARATOR-2 NOS. EACH 2200 NB & LENGTH 2400MM & WEIGHT 6200 KG.
BALL VESSEL-2 NOS. EACH 400 NB & WEIGHT 206 KG.
V-PIECE – 4 NOS. EACH 125/80 NB & 100/100 NB & WEIGHT 80 KG. +88 KG.
WORM GEAR (BALL SEPARATOR) – 4 NOS. EACH WEIGHT 60 KG.
BALL VALVES (MANUAL) – 18 NOS.-25 NB (EACH WEIGHT-2.6 KG.), 4 NOS.-50NB (EACH WEIGHT-9.25 KG.), 4 NOS.-80NB (EACH WEIGHT- 19 KG.), 6 NOS.-100NB (EACH WEIGHT 33 KG.)
BALL VALVES (ACTUATOR OPER.)- 4 NOS. EACH 100NB E WEIGHT-30 KG.
BALL RE-CIRCULATING PUMP – 2 NOS. EACH WEIGHT-121 KG.
INJECTION PIPE-8 NOS. EACH 80 NB & WEIGHT 30 KG.
DP FLUSHING PUMP- 2 NOS. EACH WEIGHT-20 KG.
SOLENOID VALVES –12 NOS. EACH 15 NB & WEIGHT 0.9 KG.
ACTUATOR(BALL SEPARATOR)-4 NOS. FRAME-71 EACH WEIGHT –45 KG.
MOTOR (BALL RE-CIRCULATOR)- 2 NOS. FRAME-PM 132 S & EACH WEIGHT-57 KG.
ACTUATOR(BALL VALVES)- 4 NOS. EACH WEIGHT –19 KG.

4. SELF CLEANING STRAINER PACKAGE: 2 SCS SYSTEMS COMPRISING OF :
STRAINER – 2 NOS. EACH 900 NB & LENGTH 2400MM & WEIGHT 2200 KG.
WORM PLANETARY GEAR – 2 NOS. EACH WEIGHT 30 KG.
BALL VALVES (MANUAL) – 16 NOS.-25 NB (EACH WEIGHT-2.6 KG.), 2 NOS.-50NB (EACH WEIGHT-8.3KG.), 4 NOS.-100NB (EACH WEIGHT 33 KG.)
BALL VALVES (ACTUATOR OPER.)- 2NOS. EACH 150NB E WEIGHT-60 KG.
FLUSHING PUMP-2NOS. EACH WEIGHT-112 KG.
DP FLUSHING PUMP WITH MOTOR – 2NOS. EACH WEIGHT-20 KG.
SOLENOID VALVES –12 NOS. EACH 15 NB & WEIGHT 0.9 KG.
NON RETURN VALVE-4 NOS. EACH 15 NB & WEIGHT73 KG.
MOTOR (FLUSHING PUMP)-2 NOS. FRAME-PM 132 M & EACH WEIGHT-70 KG.
ACTUATOR(BALL VALVES)-2 NOS. EACH WEIGHT –25 KG.
GEARED MOTOR DRIVE – 2 NOS. FRAME-71 EACH WEIGHT-8.1 KG.

BB)
1. LUBE OIL PUMPS : TOTAL WEIGHT 2500 KGS.
2. MISCELLANEOUS HOISTS (MECH. & ELECTRICAL)
CHAIN PULLEY BLOCK – TOTAL WT. 1000 KGS.
ELECTRICAL HOISTS- TOTAL WT. 6000 KGS.
3. PORTABLE OIL PURIFICATION UNIT (PORTABLE)- BY HWR

4. ME BELLOWS :20 NOS WEIGHT IS AROUND 35 TONS / UNIT.
E6/E15 - 3041KG 1600NB

E4/5/13/14 -4600 KG 1600NB
E7/ 8 / E9 -1512 KG 1200NB
E10/11/12 -1075 KG 900NB
E20/21 259 KG 500 NB
E17/18/E19 298 KG 500NB
E1/E2 /E3 269 KG 600NB

NOTE :

1. The list above is tentative and has been given to enable the contractor to study the nature of work to be done in this contract. There may be variation in size, weight etc. and no claim, whatsoever, will be entertained on account of this by BHEL.

2. Some of the packages may be sent in parts to suit the site condition / transportation, the same is to be assembled site without any extra cost, likewise the package may be assembled together and send as a single assy. Contractor may have to dismantle and erect or, erect as single assembly as per the instruction of BHEL Engineers without any extra cost.

APPENDIX-IV

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

SL.NO.	DESCRIPTION & CAPACITY OF T&P	QUANTITY	PURPOSE
01	EOT CRANE IN TG HALL 110/15T CAPACITY	01 No	FOR HANDLING AND ERECTION WITHIN TG HALL. REF ALSO CL & 7.3.1.4 & 5.2.6
02	PORTAL GANTRY CRANE WITH ACCESSORIES (360 T CAP.)	01 SET	FOR GENERATOR STATOR ERECTION ONLY. REF CL 4.6 & 5.2.2
03	75T/150-180T/325T CRAWLER CRANE	01	FOR LIFTING OF DEAERATOR SHELL AND FEED STORAGE TANK SHELL SEGMENTS TO THE NEAREST POSSIBLE FLOOR. REF ALSO CLAUSE 4.7.1, 5.2.3 & 5.2.5

APPENDIX-V

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

A: TOOL & PLANTS

Sl.No.	DESCRIPTION	MIN QUANTITY
1	CRANES OF SUITABLE CAPACITY - FOR MATERIAL HANDLING AT STORES, YARDS, AND AT SITE	1 NO.
2	TRAILER WITH HORSE - SUITABLE CAPACITY FOR TRANSPORT OF MATERIALS TO SITE	1 NO.
3	TRACTOR TROLLEY -SUITABLE CAPACITY FOR TRANSPORT OF MATERIALS TO SITE	1 NO.
4	WELDING GENERATOR SETS (ELECTRIC AS WELL DIESEL)	1 SET
5	3- PHASE COMPLETE SET UP FOR DRAWL OF POWER INCLUDING POWER CABLE ETC	1 SET
6	RADIOGRAPHY SOURCE OF ADEQUATE STRENGTH	1 NO.
7	RADIOGRAPH FILM VIEWER	AS PER REQUIREMENT
8	TIG WELDING SETS	AS PER REQUIREMENT
9	STRESS RELIEVING EQUIPMENTWITH TEMPERATURE RECORDERS	AS PER REQUIREMENT
10	ELECTRODE BAKING & HOLDING OVEN	1 NO.
11	ELECTRODE BAKING OVEN-- PORTABLE	AS PER REQUIREMENT
12	MIXER FOR GROUTING OF EQUIPMENT FOUNDATIONS	AS PER REQUIREMENT
13	VACUUM CLEANER (INDUSTRIAL)	AS PER REQUIREMENT
14	PIPE CUTTING AND BEVELLING MACHINE	AS PER REQUIREMENT
15	PIPE BENDING M/C (ELECTRIC/ ELECTRO-HYDRAULIC-UPTO 4” SIZE)	AS PER REQUIREMENT
16	AIR COMPRESSOR 120 CFM	1 NO.
17	STEP DOWN TRANSFORMER, 230V/24V	AS PER REQUIREMENT
18	CONDENSER TUBE EXPANDER SET	AS PER REQUIREMENT
19	ELECTRICALLY OPERATED WINCHES 3T/5T CAP.	AS PER REQUIREMENT

20	JACKING BOLTS / PRESSOUT BOLTS OF ALL SIZES	AS PER REQUIREMENT
21	MANUAL HYDRAULIC JACKS OF 100 T CAPACITY	6 Nos.
22	MANUAL HYDRAULIC JACKS OF 50 T CAPACITY	6 Nos.
23	GANG OPERATED JACKS OF 100 T CAPACITY	6 Nos. with broad base and 1" Lift
24	GANG OPERATED JACKS OF 63 T CAPACITY	4 Nos. with 4"-6" lift
25	HIGH PRESSURE HYDRAULIC HOSES AND COUPLING SETS ETC	12 Nos
26	TORQUE WRENCH 0 TO 200 N-M CAP.	01 NO.
27	TORQE WRENCH UPTO 2000 N-M CAP.	01 NO.
28	SLINGS FOR LP TURBINE ROTOR	01 SET
29	SLINGS FOR HP TURBINE MODULE	01 SET
30	SLINGS FOR GENERATOR ROTOR	01 SET
31	BOLT STRETCHING DEVICE (FOR TURBINE & GENERATOR FDN. BOLTS)	AS PER REQUIREMENT
32	LONG FEELER GAUGE SET	AS PER REQUIREMENT
33	SPANNERS / EYE BOLTS (OF ALL SIZES)	AS PER REQUIREMENT

B: MEASURING AND MONITORING DEVISES (MMD):

AS PER REQUIREMENT TO BE FINALIZED AT SITE.

NOTE :

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

APPENDIX-VI

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		
TOTAL		100%	

SIGNATURE OF THE TENDERER

DATE:

APPENDIX-VII

FORMAT FOR MONTH-WISE MANPOWER DEPLOYMENT PLAN

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

SL. NO.	CATEGORY	MONTHS										
		1	2	3	4	5	6	7	8	9	10	SO ON#
01	RESIDENT ENGINEER											
02	ERECTION ENGINEERS											
03	ERECTION SUPERVISORS											
04	QUALITY ASSURANCE ENGINEER											
05	SAFETY ENGINEER											
06	MATERIALS MANAGEMENT SUPERVISORS											
07	HIGH PRESSURE WELDERS											
08	STRUCTURAL & OTHER WELDERS											
09	FITTERS											
10	CRANE OPERATOR											
11	TRUCK/TRAILER DRIVERS											
12	STORE KEEPERS											
13	ELECTRICIANS											
14	SEMISKILLED/ UNSKILLED WORKERS											
	MONTH WISE TOTAL											

: Please use additional sheets for remaining contract period in the same format.

SIGNATURE OF TENDERER

DATE:

APPENDIX–VIII

FORMAT FOR DEPLOYMENT PLAN FOR MAJOR TOOLS AND PLANTS

SL. NO.	DESCRIPTION & CAPACITY OF T&P	MONTHS										
		1	2	3	4	5	6	7	8	9	10	SO ON#
01	CRANE OF SUITABLE CAPACITY FOR MATERIAL HANDLING AT YARD											
02	TRAILER WITH HORSE - SUITABLE CAPACITY FOR TRANSPORT OF MATERIALS TO SITE											
03	TRACTOR TROLLEY -SUITABLE CAPACITY FOR TRANSPORT OF MATERIALS TO SITE											
04	WELDING GENERATOR SETS (ELECTRIC AS WELL DIESEL)											
05	3- PHASE COMPLETE SET UP FOR DRAWL OF POWER INCLUDING POWER CABLE ETC											
06	RADIOGRAPHY SOURCE OF ADEQUATE STRENGTH											
07	ELECTRODE BAKING & HOLDING OVEN											
08	ELECTRODE BAKING OVEN-- PORTABLE											
09	AIR COMPRESSOR 120 CFM											
10	STEP DOWN TRANSFORMER, 230V/24V											
11	CONDENSER TUBE EXPANDER SET											
12	MANUAL HYDRAULIC JACKS OF 100 T CAPACITY											
13	MANUAL HYDRAULIC JACKS OF 50 T CAPACITY											
14	GANG OPERATED JACKS OF 100 T CAPACITY											
15	GANG OPERATED JACKS OF 63 T CAPACITY											
16	HIGH PRESSURE HYDRAULIC HOSES AND COUPLING SETS ETC											

: Please use additional sheets for remaining contract period in the same format.

Date

Signature of Tenderer

APPENDIX-IX

CONCURRENT COMMITMENTS

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

SIGNATURE OF THE TENDERER

DATE:

APPENDIX–XI

DETAILS OF SIMILAR WORK DONE DURING THE LAST SEVEN YEARS

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

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

DATE

SIGNATURE OF TENDERER WITH SEAL