भारत हेवी इलेक्ट्रिकल्स लिमिटेड
(भारत सरकार का उपक्रम)
BHARAT HEAVY ELECTRICALS LIMITED
(A Govt. of India Undertaking)

TCN - 02

Ref: PSER:SCT:SDG-B2090:TCN-02 Date:28-12-2020

Sub	Tender Change Notice (TCN) - 02.	
Job	ERECTION, TESTING, COMMISSIONING OF BOILER & AUXILIARIES INCLUDING FGD OF 1 X 660 MW UNIT-5, SAGARDIGHI TPP EXTENSION PROJECT.	
Ref	1.0	BHEL's NIT, vide reference no. PSER:SCT:SDG-B2090:8303 Date: 07-12-2020.
	2.0	BHEL's TCN-01, vide reference no PSER:SCT: SDG-B2090:TCN-01 Date: 21-12-2020.
	3.0	All other pertinent issues till date.

With reference to above, following points/documents, relevant to tender, may please be noted and complied with while submitting the offer.

1. VOLUME-IF-CML REV-01 TECHNICAL CONDITIONS OF CONTRACT and ANNEXURE-I:BILLING SCHEDULE-REV-01 attached superseding VOLUME-IF-CML REV-00 TECHNICAL CONDITIONS OF CONTRACT and ANNEXURE-I:BILLING SCHEDULE respectively issued earlier with NIT.

2. Clarifications/Modifications attached vide Annexure-A to this TCN-02.

3. Due date of submission of offer is extended from 28-12-2020 to 11-01-2021 (15-00 hrs. IST). Bidders are requested to submit their offer by extended due date positively.

4. Revised `No deviation certificate' is attached. Bidder to submit `No deviation certificate' as per attached format only.

5. All other terms & conditions shall remain unchanged.

Thanking you,

Yours faithfully,
for BHARAT HEAVY ELECTRICALS LTD

Dy. Mgr (SCT)

Encl: As Above.

पावर सेक्टर पूर्वी क्षेत्र (मुख्यालय)
POWER SECTOR EASTERN REGION, DJ-9/1, SALT LAKE CITY, KOLKATA - 700 091
फैक्स/Fax : (033) 23211960 फोन/Phone : बोर्ड/EPABX : (033) 2339 8000

JOB : ERECTION, TESTING, COMMISSIONING OF BOILER & AUXILIARIES INCLUDING FGD OF 1 X 660 MW UNIT-5, SAGARDIGHI TPP EXTENSION PROJECT.

Tender no:PSER:SCT:SDG-B2090:20.

ANNEXURE-A TO TCN-02

CLARIFICATIONS / MODIFICATIONS

SL. NO.	REFERENCE CLAUSE OF TENDER	EXISTING PROVISION	BIDDER'S QUERY	BHEL'S CLARIFICATION/MODIFICATION
1.0	Sl.No.3 of A of APPENDIX-III : MAJOR TOOLS AND PLANTS & MMEs TO BE DEPLOYED BY THE CONTRACTOR of VOLUME-IF-CML Rev-00 TECHNICAL CONDITIONS OF CONTRACT:Crawler cranes 75 T.	02 nos.:1st Crane to be made available at site after 30 days from ... of Full load.	Quantity of the 75 T, 40T is high (2 Nos each) for the specified quantum of the work. The cost impact towards deployment of 2 Nos each 75 T & 40 T will lead to out from the competition. Please revise same to 1 No each.	Necessary changes suiting with project requirement has been incorporated in the Tender TCC. Please refer VOLUME-IF-CML Rev-01 TECHNICAL CONDITIONS OF CONTRACT.
2.0	Sl.No.4 of A of APPENDIX-III : MAJOR TOOLS AND PLANTS & MMEs TO BE DEPLOYED BY THE CONTRACTOR of VOLUME-IF-CML Rev-00 TECHNICAL CONDITIONS OF CONTRACT:Crawler cranes 40 T.	02 nos:1st Crane to be made available at site after 30 days from … Full load.		
3.0	Annexure-I-Billing schedule.	BILLING SCHEDULE	Percentage allocated towards painting is very less compared with the cost incurring towards Supply, Application of Painting work. We request BHEL to increase the % allocated for Painting or incorporate this as a separate line item. Kindly consider our request and revise the percentage suitably.	Required changes has been incorporated in the Billing Schedule. Please refer ANNEXURE-I BILLING SCHEDULE-REV-01.
4.0	Clause no.39.0 of VOLUME-IF-CML Rev-00 TECHNICAL CONDITIONS OF CONTRACT:Over run compensation.	Not applicable for this tender.	ORC shall be made applicable for this contract because of the remoteness of the project and also since it will be difficult to predict the completion of Project in view of the disruption due to ongoing pandemic.	ORC shall be applicable as per relevant provision of GCC. Please refer VOLUME-IF-CML Rev-01 TECHNICAL CONDITIONS OF CONTRACT.
5.0	Sl No.23 of Non- Pressure parts (Group-III) of APPROXIMATE WEIGHT SCHEDULE OF MAJOR PACKAGES FOR 1X660 MW SAGARDIGHI PROJECT of of VOLUME-IF-CML Rev-00 TECHNICAL CONDITIONS OF CONTRACT:Steam Blowing Piping.	125 MT	The scope includes Erection & Dismantling. As requested by us in the earlier clarification request, we request BHEL to consider our request and Incorporate the separate line item for the Temporary works of Commissioning.	All the temporary piping & support is coming under non pressure part rate. Hence, temporary piping & support is coming under category of non pressure part scope.
6.0	Sl No-24 of Non- Pressure parts (Group-III) of APPROXIMATE WEIGHT SCHEDULE OF MAJOR PACKAGES FOR 1X660 MW SAGARDIGHI PROJECT of of VOLUME-IF-CML Rev-00 TECHNICAL CONDITIONS OF CONTRACT:Acid Cleaning Piping.	150 MT		
7.0	Sl No.25 of Non- Pressure parts (Group-III) of APPROXIMATE WEIGHT SCHEDULE OF MAJOR PACKAGES FOR 1X660 MW SAGARDIGHI PROJECT of of VOLUME-IF-CML Rev-00 TECHNICAL CONDITIONS OF CONTRACT:H & S for Acid Cleaning Piping.	18 MT		
8.0	Sl No.26 of Non- Pressure parts (Group-III) of APPROXIMATE WEIGHT SCHEDULE OF MAJOR PACKAGES FOR 1X660 MW SAGARDIGHI PROJECT of of VOLUME-IF-CML Rev-00 TECHNICAL CONDITIONS OF CONTRACT:H & S for Temporary Piping.	16 MT		
9.0	Clause no.38.0 of VOLUME-IF-CML Rev-00 TECHNICAL CONDITIONS OF CONTRACT:Price variation compensation.	Applicable as per the relevant clause of GCC.	Due to the pandemic, the market trend is so volatile that no one is able to predict the same. Further, Governments are found to revise the minimum wage structure all of a sudden which imposes tremendous pressure on the contractors and hence we request BHEL to make the PVC applicable from the date of NIT by incorporating the wage component also in the formula. In this connection request BHEL to implement the New formula devised and made applicable in all NTPC projects.	PVC will be applicable as per the relevant clause of GCC.
10.0	Clause no.41.3 of of VOLUME-IF-CML Rev-00 TECHNICAL CONDITIONS OF CONTRACT.	No PVC, rate revision, over run charge/ compensation is applicable for extra works.	Rate revision may be made applicable for this project beyond the completion period. We request to BHEL to consider our request and provide the allowance for rate revision in the tender.	Sagardighi Unit#5 project is to be executed as per schedule and intermediate milestone LD is applicable also . However, for timely execution of this project, Bonus clause has been introduced in this tender. Therefore, it is most important to maintain time schedule at Sgaradighi project and all efforts to be made to avoid missising of any milestone. Therefore, no rate revision is applicable.
11.0	Sl no.10 of Non-Pressure Parts (Group-III) of APPENDIX-I APPROXIMATE WEIGHT SCHEDULE OF MAJOR PACKAGES FOR 1X660 MW SAGARDIGHI PROJECT of VOLUME-IF-CML Rev-00 TECHNICAL CONDITIONS OF CONTRACT:Oil System Piping's.	95 MT	We request BHEL to consider our request and include the quantity in the Carbon Steel Piping (Group VII).	Oil system piping being low thickness Carbon steel piping; it has been considered as non pressure part.
12.0	Sl no.44 of FGD System (Group-IX) of APPENDIX-I APPROXIMATE WEIGHT SCHEDULE OF MAJOR PACKAGES FOR 1X660 MW SAGARDIGHI PROJECT of VOLUME-IF-CML Rev-00 TECHNICAL CONDITIONS OF CONTRACT:ABSORBER SYSTEM-RUBBER LINING.	10 MT	The clarification provided in the Corrigendum in ANNEXURE-A TO TCN-01 is not clear. We request to kindly clarify the bidders scope of work in the item.	PGMA FW 225, shall be used for glass flake lining. Application of this glass flake lining shall be done at site by doing surface preparation/shot blasting suitable for proper fixing of glass flake lining as per specification. Scope of this work may vary as per final decision taken by BHEL at later stage.in FGD system, there will be 03 nos tanks : 1. Emergency slurry tank/Auxiliary Absorbent Tank-1 number 2. Process water tank-1 number 3. Emergency Quench water tank-1 Number The interior of Emergency slurry tank/Auxiliary Absorbent Tank shall be lined with glass flake lining. There is one sump (Drain pit) in absorber area. This sump shall be either rubber lined or epoxy lined or glass flake lined which is also covered under this PGMA scope of work.

CONTENTS

This volume shall be construed as part of tender document and shall be read along-with others volumes of tender. Unless otherwise specified, in case of any conflict or inconsistency between the general and technical conditions, the same shall be brought out by the bidder in writing to BHEL for clarification during pre-bid discussions; if applicable; failing which most stringent interpretation/ clause in favour of BHEL shall be adopted and the same shall be binding to the bidder. Unless otherwise specified, all terms & conditions shall be applicable for entire scope and for each package of the tender.

CLAUSE NO	DESCRIPTION
1.0	**PROJECT SYNOPSIS AND GENERAL INFORMATION**
	DETAILS OF PROPOSED STAGE/ UNITS
1.1	Project name: Sagardighi Thermal Power Extension Project, unit # 5, 1x660 MW. No of unit x capacity: 1 x 660 MW (Super-critical). Project setting up by: West Bengal Power Development Corporation Limited. Design ambient dry bulb temp: 500 C maximum & 50 C minimum Max relative humidity: 84%. Average rainfall: 1389 mm.
1.2	APPROACH TO SITE
	The site is located at Manigram, about 13 km north of Sagardighi town by the side of the SMGR (Sagardighi-Manigram-Gankar-Raghunathgunj) road at a distance 20 km. from National Highway 34 in Murshidabad district in W.B and around 240 km from Kolkata. Nearest railway station is Manigram adjacent to the site on Bandel-Barhawara branch line and 6.5 km from Sagardighi Railway Station on Sainthia-Azimgunj line of Eastern Railway. Nearest Airport: NSC Bose Air Port, Kolkata. Nearest Seaport: Haldia / Kolkata
2.0	**SITE VISIT**
	The contractor should visit project site and acquire full knowledge and information about conditions prevailing at site and in & around the plant premises, together with all the statutory, obligatory, mandatory requirements of various authorities before submission of the bid.
3.0	**NAME OF WORK**
3.1	The scope covers Erection, Testing and assistance for commissioning, Trial Operation & PG Test including handling of materials at BHEL / Client's Stores / Storage Yard and transportation to site of; Boiler & its Auxiliaries, ESP and its auxiliaries, Boiler integral piping, Critical Piping (P91), HP/LP piping, Structure for bunker (BHEL Mfg units Supplied items), Non Pressure Parts, Duct, dampers and its support structure, Rotating Equipment, Air Pre Heaters, ID/FD/PA fans, SCR and its auxiliaries, FGD and its auxiliaries, Lining and Insulation, Supply and application of final painting of 1 X 660 MW Unit-5, Sagardighi TPP Extension Project.
4.0	**BROAD SCOPE OF WORK**
	The scope of work shall comprise but not limited to the following: (All the works mentioned hereunder shall be carried out within the accepted rate unless otherwise specified.)
4.1	The work to be carried out at quoted / accepted rates by the Contractor under the scope of these specifications covers the complete work of handling, loading and transporting of materials from project stores sheds / storage yards to site of erection or preassembly yard and unloading at pre-assembly area/erection site, checking, cleaning chipping and levelling of foundations, providing packers and shims/pre-assembling of equipment at the preassembly yard, inspection, minor rectification, preservation, erection, levelling, and other adjustments, cutting, edge / surface preparation, welding, grinding, radiography, LPI/ MPI/ UT testing wherever needed, heat treatment, carrying out air tightness test by soap solution / kerosene, hydraulic test, steam / air blowing, light up, chemical cleaning, passivation, steam blowing and safety valve floating including inter connection of all the termination points, erection

	and dismantling of all temporary piping, valves, pumps, tanks etc., required for the above operations, all pre-commissioning tests and trial runs of Boiler & its Auxiliaries, ESP and its auxiliaries, Boiler integral piping, Critical Piping (P91), HP/LP piping, Structure for bunker (BHEL Mfg units Supplied items), Non Pressure Parts, Duct dampers and its support structure, Rotating Equipment, Air Pre Heaters, ID/FD/PA fans, SCR and its auxiliaries, FGD and its auxiliaries, Lining and Insulation, Supply and application of final painting of 1 X 660 MW Unit-5, Sagardighi TPP Extension Project.
4.2	The quantities indicated in the tender specification are approximate and are liable for variation and alteration at the discretion of BHEL. The quoted unit rate shall be applicable for any additional product group also, if included at a later date integral to the main scope of work / package envisaged. The work executed shall be measured and priced as per the unit rate arrived at for each work area as mentioned in the relevant clauses.
4.3	The PGMA wise breakup of Boiler and Auxiliaries, ESP and Auxiliaries, Critical Piping (P91), HP/LP piping, NPP, rotating machinery, FGD, SCR, insulation etc. are indicated in the relevant chapters of this tender specification, but the contractor is required to erect actual tonnage which may be necessary to complete the work in all respects as detailed in the tender specifications, for which payments shall be released on finally settled rates. The weights and dimensions of material shown are approximate and are liable to vary. No increase in quoted / accepted rates / prices shall be allowed due to change in weights and dimensions of the equipment / materials.
4.4	The weights given in the weight schedule for various major packages in Appendix-I are approximate and these are subject to change as per site conditions.
4.5	Supervisors / Engineers, consumables, labour, watch and ward, tools & tackles, calibrated MMD as specified and otherwise required for the work etc., required for the scope of work shall be provided by the contractor. All the expenditure including taxes and incidentals in this connection will have to be borne by him unless otherwise specified in the relevant clause. The contractor's quoted price should be inclusive of all such contingencies.
4.6	It shall be specially noted that, the contractor may have to work round the clock (24x7) to achieve the completion schedules / plans / targets during the entire course of erection, testing and commissioning works, which may involve payment of considerable overtime. Hence contractor's quoted rate shall take into consideration of all expenses that will be incurred for such arrangement of personnel including labours, engineers / supervisors, T&Ps etc.
4.7	The terminal points can be inferred from the relevant drawings and any further clarifications can be obtained / decided by BHEL and that is final and binding on the contractor for deciding the scope of work and effecting the payment for the work done up to the terminals. Carrying out work as per the specification between equipment constituting terminal points, whether the terminal equipment fall within the scope of work/specification, contractor shall carry out the terminal joints at either end. Also where the piping connection to the terminal points involve flanged joints, matching of flanges, fixing gaskets, bolting and tightening as per BHEL Engineers instructions is in the scope of work. In case piping connected to equipment, matching of flanges for achieving the parallelism and alignment at the equipment end, by suitably resorting to heat correction or other method as instructed by BHEL Engineer, with in the quoted price.
4.8	The contractor shall submit a copy of license to undertake construction / repair of Boilers & Piping issued by Boiler inspectorate before commencement of Pressure Parts / Piping Erection.
4.9	All IBR formalities including arrangement of visit of IBR authorities is covered in vendor's scope. All statutory fees for Boiler work will be deposited by contractor, BHEL will reimburse the charges on submission of bill enclosing the details/receipt of fees issued by the Office of the Directorate. However, fees for radiography inspection are covered in vendor's scope. The vendor should have Form – 392 from State Boiler Directorate.
4.10	The work shall conform to dimensions and tolerances given in various drawings and

	quality manuals provided by BHEL. If any portion of work is found to be defective in workmanship not conforming to drawings or other stipulations, the contractor shall dismantle and redo the work duly replacing the defective materials at his cost, failing which the job will be carried out by BHEL by engaging other agencies / departmentally and recoveries will be effected from contractor's bill towards expenditure incurred including applicable overhead charges.
4.11	Contractor has to work in close co-ordination with other erection agency at site. BHEL engineer will co-ordinate area clearance. In a project of such magnitude, it is possible that the area clearance may be less/more at a particular given time. Activities and erection program have to be planned in such a way that the milestone events like boiler light up, steam blowing, SV Floating, FGD commissioning, SCR & ESP readiness etc., are achieved as per schedule/ plans. Contractor shall arrange & augment the resources accordingly.
4.12	The storage yard is located inside the Main Plant Boundary at a distance of approximately 2-3 KM from the location of working area. All other materials have to be transported from storage yard to construction area by the contractor at his own cost.
4.13	During the course of erection, testing and commissioning, certain rework / modification / rectification / repairs / fabrication etc will be necessary on account of feedback/revision from various relevant sources, and also on account of design discrepancies/ alterations, manufacturing defects, site operations/ maintenance requirements. This will also include modifications / re-works suggested by BHEL / customer / other inspection group. Contractor shall carry out such rework / modification / rectification / fabrication / repairs etc promptly and expeditiously. Daily log sheets indicating the details of work carried out, man-hours etc shall be maintained by the contractor and got signed by BHEL engineer every day. Claim of Contractor if any, for such works will be governed by relevant clauses of 'General Conditions of Contract'
4.14	The scope of work covered under this specification is of highly sophisticated nature, requiring the best quality workmanship, engineering and construction management and green belt management. The contractor should ensure successful and timely completion of the work. The contractor must have adequate quantity of tools, construction aids, equipment etc., in his possession. He must also have on his rolls adequate trained, qualified and experienced supervisory staff and skilled personnel. The manpower deployment identified by contractor shall match with above scope of works.
4.15	Contractor shall execute the work as per sequence and procedure prescribed by BHEL at site. The erection manuals for boiler pressure parts, structures etc., which are available with BHEL site office are to be referred for compliance and guidance before taking up the work. Any failure to comply with the above might lead to rework and the cost for the same shall be borne by the contractor only. BHEL engineer, depending upon the availability of materials, fronts etc., will decide the sequence of erection and methodology. No claims for extra payment from the contractor will be entertained on the grounds of deviation from the method of erection adopted in erection of similar jobs or for any reason whatsoever.
4.16	Piping materials as received from BHEL units shall be issued. Pipelines are generally supplied with extra lengths which are to be cut to size, edge prepared for which no separate payment is envisaged. Hangers & supports are generally received from units in prefabricated condition. Where hanger & support materials are supplied as running meter which are to be fabricated at site no separate payment is envisaged.
4.17	Supply of all electrodes & TIG wire (except those special TIG wires supplied by Trichy) is in vendor's scope.
4.18	Dismantling, removal of debris, leveling etc of all temporary buildings, structures, pipelines, cables etc as per instruction of BHEL on completion of work. If contractor fail to do so, BHEL will get the job done through other agency and the cost along with applicable overhead will be recovered from the contractor. Decision of BHEL engineer in this regard shall be final & binding on contractor. 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. After Chemical cleaning activity, effluent has to be disposed off safely from neutralizing pit to a safe area as per instruction of BHEL Engineer. Neutralisation pit for EDTA cleaning/Acid cleaning is to be made by the Contractor. After completion of job pit has to be dismantled and area is to be levelled before handing over of area to owner. The pit size shall be approx. 30x30x2m, however it shall suitably decide jointly at site as per site requirement. Cost incurred in construction of neutralization pit shall be borne by the contractor.
4.19	Brief feature of Steam generator Steam generator is consist of mainly Spiral Wall Evaporator upto to ~ 11 m below the nose, and remaining vertical wall, Two-pass design, Once through, Radiant Reheat, Balanced Draft, Tilting Tangential Burners, Low Load Start Up system up to 35% BMCR load, Side Mill Layout, Cold PA system, Two axial reaction FD fans, Two axial reaction PA fans, Two axial reaction ID fans, Two Regenerative Tri sector Air Preheaters, Eight Vertical spindle Bowl Mills, Gravimetric Feeders (Microprocessor based), Microprocessor based BMS, SADC, and SB controls.
4.20	FGD system consisting of Slurry Recirculation Pumps, Oxidation Blowers & accessories, Limestone Grinding system, Gypsum Dewatering System, Slurry Pumps & accessories, Agitators for Tanks & Drain pits, Spray Nozzles, Spray Pipes, Mist Eliminator, Emergency Quenching system, Non Metallic Expansion Joints, Water Pumps & accessories, Elevators etc.
4.21	Supply and application of final paining: • The scope includes the supply and application of final paining for the systems/items/components covered in the entire scope of work including supply of primer, paints and associated consumables. • In case any shop painted structure/component is required to be repainted due to the reasons attributable to the contractor such as Mis-handling, damage during erection process, other reasons incidental to the work etc, such touch-up painting/re-painting of the components/structures shall be in the scope of the contractor including the supply of paints and primers along with all required consumables.
4.22	The bidder will comply with HSE (Health, Safety & Environment) requirements of BHEL and follow all applicable Operational Control Procedures (OCPs) within quoted rate/ price.
4.23	All other points shall be as per the terms & conditions and specification along with aforesaid references together with amendments incorporated thereto.
5.0	**GENERAL TECHNICAL REQUIREMENTS (CODES AND STANDARDS)**
5.1	Except where otherwise specified, the plant/equipment shall comply with the appropriate Indian Standard or an agreed internationally accepted Standard Specification as mentioned elsewhere in contract specifications, each incorporating the latest revisions at the time of tendering. Where no internationally accepted standard is applicable, the Bidder shall give all particulars and details as necessary; to enable BHEL to identify all of the plant/equipment in the same detail as would be possible had there been a Standard Specification.
5.2	Where the Bidder proposes alternative codes or standards he shall include in his tender one copy (in English) of each Standard Specification to which materials offered shall comply. In such case, the adopted alternative standard shall be equivalent or superior to the standards mentioned in the specification.
5.3	In the event of any conflict between the codes & standards referred above, and the requirements of this specification, the requirements which are more stringent shall govern.
5.4	Tools used during erection and commissioning shall not be accepted except with the specific approval of the Engineer.
5.5	Wherever specified or required the plant/ equipment shall conform to various statutory regulation such as Indian Boiler Regulation, Indian Electricity Rules, Indian Explosive Act, Factories Act etc. wherever required, obtaining approval for Plant / Equipment supplied under the specification from statutory authorities shall be the responsibility of the contractor.

6.0	**SERVICES TO BE RENDERED BY THE BIDDER**
	Services for construction, fabrication, equipment erection, testing, trial run, commissioning/ completion of various equipment & accessories/ items under the contract shall include but not be limited to the following.
6.1	Collecting materials from store/ open yard from time to time for fabrication/ erection as per the construction program as per flow of consignment. The contractor shall be the custodian of all the materials issued till the plant/ equipment is officially taken over by the owner/ BHEL after complete erection and commissioning/ completion. The contractor shall maintain adequate security personnel and security measures for proper precaution and safety of material.
6.2	Transport of material to their respective places of erection and erection of the complete plant & equipment as supplied under this specification.
6.3	Trial run and commissioning of individual equipment/ sub-systems to the satisfaction of owner/ BHEL.
6.4	Deployment of all skilled and unskilled manpower required for erection supervision, watch & ward, for commissioning/ completion and other services to be rendered under this specification.
6.5	Deployment of all erection tools & tackle, construction machinery, transportation vehicles and all other implements in adequate number and size, appropriate for the erection work to be handled under scope of this specification except otherwise specified.
6.6	Supply of all consumables, eg welding electrodes, etc as well as materials required for temporary supports, scaffolding etc as necessary for such construction work, unless specified otherwise.
6.7	Providing support services for the contractor's erection staff, eg construction of site offices, temporary stores, residential accommodation and transport to work site for erection personnel, watch and ward for security and safety of the materials under the contractor's custody etc, as required.
6.8	Maintaining proper documentation of all site activities undertaken by the contractor as per the proforma, mutually agreed with BHEL, submitting monthly progress reports as also any such document as and when desired by BHEL/ owner, taking approval of all statutory authorities e.g. Boiler inspector, Factory Inspector, Inspector of Explosives , Provident Fund authority etc for respective portions of work under the jurisdiction of such statutes of laws.
6.9	As part of overall project management activity, the contractor shall be responsible for proper co-ordination of erection activities during various phases of execution of the contract. The contractor shall identify a person designated as Construction Manager, with whom BHEL shall interact on matters related to execution of the contract. The construction manager shall be the single point contact person on behalf of the contractor. BHEL shall interact with the construction manager only on all matters on co-ordination between BHEL and the contractor. For timely completion of work the contractor may have to work in one or more shifts. He will not be eligible for any extra charge on this account.
6.10	Services for construction, fabrication, equipment erection, testing, trial run, commissioning/ completion of various equipment & accessories/ items under the contract shall include but not be limited to the following.
6.11	The contractor shall confine all his field operations to those works which can be reformed without subjecting the equipment and materials to adverse effects, during inclement weather conditions, like monsoon, storms etc and during other unfavorable construction conditions. No field activities shall be performed by the contractor under conditions which might adversely affect the quality and efficiency thereof, unless special precautions or measures are taken by the contractor in proper and satisfactory manner in the performance of such works and with the concurrence of the engineer. Such un-favourable construction conditions in no way relieve the contractor of his responsibility to perform the works as per the schedule.
6.12	The contractor shall supply all the skilled workmen like mill-wright fitters, welders, gas cutters, electricians, riggers, sarangs, erectors, carpenters, pipe fitters, masons, laggers, tin-smiths, instrument mechanics etc, in addition to other skilled, semi-skilled and unskilled workmen required for all works of handling and transportation

	from site store to erection site, erection, testing and commissioning/ completion contemplated under this specification. Only fully trained and competent men with previous experience on the job shall be employed. They shall hold valid certificates wherever necessary. BHEL reserve the right to decide on the suitability of the workers and the other personnel who will be employed by the contractor. BHEL reserves the right to insist on removal of any employee of the contractor at any time, if they find him unsuitable and the contractor shall forthwith remove him.
6.13	The supervisory staff employed by the contractor shall be technically qualified and experienced in the area of work. They shall ensure proper out turn of work and discipline on the part of labour put on the job by the contractor and in general see that the works are carried out in a safe and proper manner and in coordination with other labour and staff employed directly by BHEL or other contractors of BHEL and BHEL's client.
6.14	The contractor shall also furnish daily labour report showing by classification the number of employees engaged in various categories of work a progress report of work as required by BHEL engineer.
6.15	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 co-operate with other personnel, and other contractors, coordinate his work with others and proceed in a manner that shall not delay or hinder the progress of work as a whole.
6.16	The contractor's supervisory staff shall execute the work in the most substantial and workman like manner in the stipulated time. Accuracy of work and aesthetic finish are essential part of this contract. The contractor shall be responsible to ensure that assembly and workmanship conform to the dimensions and tolerance given in the drawing / instruction given by BHEL engineer from time to time.
6.17	It is the responsibility of the contractor to engage his workman in shifts or on overtime basis for achieving the target set by BHEL during erection, commissioning/ completion and testing period. Contractor's quoted rate shall include all these contingencies.
6.18	All the materials issued to the bidder by BHEL shall be reconciled by the bidder and the unused materials have to be returned back to BHEL stores/yard or any other place as specified by BHEL.
6.19	Supply & application of final paint on all the equipment to be erected is under the scope of the contractor.
6.20	After completion of commissioning activity of equipment/ systems, the contractor shall prepare the test reports which shall include all the relevant information related to various commissioning checks, tests carried out, any deviations/ commissioning noticed wrt the intended design requirements, sequence of various commissioning activities as actually adopted vis-à-vis as recommended in the procedures, program schedule achieved and any other such information as required .These Test Reports shall be submitted in requisite number of copies to BHEL/ owner/ contractor involved during the commissioning activities.
6.21	Any other service, although not specifically called for but required for a contract of the size and nature indicated in the specification.
7.0	**SITE ORGANISATION**
7.1	The contractor shall maintain a site organization of adequate strength in respect of manpower, construction machinery and other implements at all time for smooth execution of the contract headed by a competent Construction Manager (CM) for site operations with sufficient level of authority to take site decisions. The contractor will submit organization chart (showing the name of CM) with individual bio-data indicating various levels of experts to be posted for supervision in the field of execution of main Boiler works, FGD, SCR, ESP, quality, material management, planning, safety, etc. The organization shall be reinforced from time to time, as required to make up slippage (if any) from schedule without any commercial implication to BHEL. The organization chart is to be submitted within 10 days from the date of LOI.
7.2	Following (minimum) engineering manpower with power plant construction background to be deployed at site in Boiler , Rotary Equipment & piping area by the

	successful bidders for their day to day supervision etc. from date of start of work .	
7.2.1	Planning engineer.	01 no.
7.2.2	Qualified safety officers with assistants (exclusive for safety supervision for project jobs).	Safety Officer – 02 nos. Safety Steward – 04 nos.
7.2.3	Site engineer and supervisors for supervision.	Engineers – 05 nos. Supervisors – 07 nos.
7.2.4	Site engineer and supervisors for quality inspection.	Quality Engineer – 02 nos
7.3	NDT specialist with NDT level 2 certification.	02 nos.
7.3.1	Following (minimum) engineering manpower with power plant construction background to be deployed at site in FGD, ESP & SCR area by the successful bidders for their day to day supervision etc. from date of start of work .	
7.3.2	Planning engineer.	01 no.
7.3.3	Qualified safety officers with assistants (exclusive for safety supervision for project jobs).	Safety Officer – 01 no. Safety Steward – 03 nos.
7.3.4	Site engineer and supervisors for supervision.	Engineers – 03 nos. Supervisors – 06 nos.
7.3.5	Site engineer and supervisors for quality inspection.	Quality Engineer – 02 Nos
7.3.6	NDT specialist with NDT level 2 certification.	As required
7.4	Engineer/ supervisor for other functions like store & purchase, material management, planning, FIN, administration etc are to be provided as per site requirement and not referred above.	
7.5	Bidder shall deploy the manpower as per site requirement towards efficient and timely execution of job. Bidder must adhere to the manpower requirements as to be intimated by BHEL site authorities for the aforesaid minimum manpower details. In the event of failure of the contractor to provide necessary manpower indicated above, BHEL reserves the right to deduct Rs 50,000 per man-month for Qualified Engineer/NDT specialist/Safety Officer and Rs 30,000 per man-month for the Supervisors/safety stewards from RA bills and the deductible amount will be suitably decided by BHEL site authority. Further induction of manpower regarding site supervisor & site engineer will be decided at site as per requirement.	
7.6	For rendering commissioning assistance with effect from Completion of Steam Blowing to handing over, a dedicated gang of 16 (Sixteen) persons (2 Rigger, 2 Welder , 2 fitter, 1 Gas cutter , 1 Grinder, 1 Electrician, 7 Helpers) along with an exclusive supervisor need to be deployed by the vendor to attend the incidental works of commissioning as per the instruction of BHEL commissioning engineer. The total gang will report to BHEL and will follow instruction of BHEL's commissioning engineer. This gang with supervisor shall be separate and will be there besides other personnel to be provided by the contractor for his day-to-day work. The gang need to be provided during ongoing commissioning activities at site as per requirement of BHEL commissioning engineer. They shall be equipped with all necessary hand-tools to attend all the incidental works during commissioning.	
7.7	In the event of failure of the contractor to provide necessary manpower indicated above as per requirement for a continuous period of 3 days or more, BHEL reserve the right to recover the amounts at the following rates: Rs 30,000 per man-month for supervisor. Rs 20,000 for skilled worker/electrician & Rs 14000 for semi-skilled/un-skilled worker Amount for deduction for non-deployment will be calculated from the date of requirement intimated by BHEL site engineer up to the date of actual deployment. This deduction will be made from the vendor's RA bills.	
7.8	BHEL reserve the right to reject or approve the list of personnel proposed by the	

	contractor. The persons whose bio-data have been approved by BHEL will have to be posted at site and deviation in this regard will not be permitted unless specific & reasonable justification is made.
7.9	In addition to above, a well experienced qualified engineer to be designated, as 'Project coordinator', shall be deployed by the contractor. Such engineer shall have adequate exposure on the job and shall remain fully involved in all planning activities, guidance etc to contractor's own team during complete execution period of contract.
7.10	The contractor should also submit to BHEL for approval a list of T&Ps along with their fitness certificates. The tools & tackles shall not be removed from site without written permission of BHEL.
8.0	**ERECTION SCHEDULE**
	The contractor should also submit network programs for erection and commissioning of various items of Boiler & auxiliaries (separately), ESP and Aux., FGD and SCR system before start of work for approval of BHEL. These networks shall show input requirements from customer/ BHEL for achievement of program schedule. Program Network shall be submitted within 2 weeks of the date of LOI. The same shall be in commensuration with the project schedule mentioned in the tender.
9.0	**CONSTRUCTION MANAGEMENT**
9.1	Based on the approved program, the contractor shall submit a detail area wise program of construction/ erection/ commissioning for Boiler & aux and all other systems as per scope for the implementation. These programs would be amplified showing start of erection and subsequent activities and shall form the basis for site execution and detail monitoring. The three monthly rolling program with the first month's program being tentative based on the site condition would be prepared based on these programs. The contractor shall also be involved along with owner/ BHEL to tie up detailed resources mobilization plan over the period of the contract matching with the performance targets.
9.2	The program would be jointly finalized by the site in-charge of the contractor with BHEL/ owner's project coordinator as well as the site-planning representative. The erection program will also identify sequential events matching financial turnover.
10.0	**PROJECT PROGRESS REVIEW MEETINGS**
10.1	Periodic progress reviews on the entire activities of execution in respect of supply & works in scope of bidder will be held once in a month at Kolkata/ site. These meetings will be attended by reasonably higher officials of the Contractor and will be used as a forum for discussing all areas where progress needs to be speeded up. Actions will be placed on the concerned agencies and decisions will be taken to expedite/speed up the progress. Minutes of such meetings will be issued reflecting the major discussions and decisions taken and circulated to all concerned for reference and action. The contractor shall be further responsible for ensuring that suitable steps are taken to meet various targets decided upon such meetings.
10.2	In addition to the above and to streamline the construction and erection at site a suitable frequency and forum of periodic meetings between the contractor and the Customer/ BHEL will be decided upon as part of erection coordination procedure.
11.0	**CERTIFICATE TOWARDS COMPLETION**
	The work under the scope of the contractor will be deemed to be completed in all respects only when so certified by BHEL. The decision of BHEL shall be final and binding on the contractor.
12.0	**EXTENSION OF TIME FOR COMPLETION**
12.1	If the completion of work as detailed in the scope of work gets delayed beyond the contract / completion period, the contractor shall request for an extension of the contract and BHEL at its discretion may extend the contract.
12.2	A joint programme shall be drawn for the balance quantity of work to be completed during the period of 'Time Extension', along with matching resources to be deployed by the contractor as per specified format. Review of the programme and record of shortfall shall be done.
12.3	During the period of 'Time extension', contractor shall maintain their resources as per mutually agreed program.
12.4	The part of extension attributable to the contractor, if any, in total contract extension

	shall be exhausted first i.e., immediately after end of contract period. This shall be followed by the extension on account of force majeure conditions, if any, and lastly on account of BHEL.
12.5	In case 'Time extension' is granted to the contractor to facilitate continuation of work and completion of contract, due to backlog attributable to the contractor alone, then it shall be without prejudice to the rights of BHEL to impose penalty/ LD for the delays attributable to the contractor, in addition to any other actions BHEL may wish to take at the risk and cost of contractor.
13.0	**PROTECTION**
13.1	Equipment having anti-friction or sleeve bearings shall be protected by weather tight enclosures. Coated surfaces shall be protected against impact, abrasion, discoloration and other damages. Surfaces which are damaged shall be repainted.
13.2	Electrical equipment, controls and instrumentations shall be protected against moisture and water damages. All external gasket surfaces and flange faces, couplings, rotating equipment shafts, bearings and like items shall be thoroughly cleaned and coated with rust preventive compound and protected with suitable wood, metal or other substantial type covering to ensure their full protection. All exposed threaded parts shall be greased and protected with metallic or other substantial type protectors.
13.3	All piping, tubing and conduit connections on equipment and equipment openings shall be closed with rough usage covers or plugs. Female threaded openings shall be closed with rough usage covers or plugs or forged steel plugs. The closures shall be taped to seal the interior of the equipment. Open ends of piping, tubing and conduit shall be sealed and taped.
13.4	All erected equipment/ components to be preserved as per the preservation recommendation of BHEL. For this type of preservation, contractor shall engage an exclusive team of persons for meeting the continuous requirement. However, the required preservatives will be supplied to the contractor free of cost. All other consumables including wire brush, emery papers, painting brush etc to be supplied by the contractor within the quoted rate.
14.0	**ERECTION SERVICES**
14.1	As part of overall project management activity, the contractor shall be responsible for proper co-ordination of erection activities during various phases of execution of the contract. The contractor shall identify a person designated as construction manager, with whom BHEL shall interact on matters related to execution of the contract. The construction manager shall be the single point contract person on behalf of the contractor. BHEL shall interact with the construction manager only on all matters on co-ordination between BHEL and the contractor.
14.2	The contractor shall confine all his field operations to those works which can be reformed without subjecting the equipment and materials to adverse effects, during inclement weather conditions, like monsoon, storms etc and during other unfavorable construction conditions. No field activities shall be performed by the contractor under conditions which might adversely affect the quality and efficiency thereof, unless special precautions or measures are taken by the contractor in proper and satisfactory manner in the performance of such works and with the concurrence of the engineer. Such unfavorable construction conditions in no way relieve the contractor of his responsibility to perform the works as per the schedule.
14.3	The contractor shall supply all skilled workmen HP welders, gas cutters, electricians, riggers, sarangs, erectors, carpenters, fitters, masons, laggers, tin-smiths, instrument machines etc, in addition to other skilled, semi-skilled & unskilled workmen required for all the works of handling and transportation from site store to erection site, erection, testing and commissioning contemplated under this specification. Only fully trained and competent men with previous experience on the job shall be employed. They shall hold valid certificates wherever necessary. BHEL reserve the right to decide on the suitability of the workers and the other personnel who will be employed by the contractor. BHEL reserve the right to insist on removal of any employee of the contractor at any time, if they find him unsuitable and the contractor shall forthwith remove him.
14.4	The supervisory staff employed by the contractor shall be technically qualified and

	experienced in the area of work. They shall ensure proper out turn of work and discipline on the part of labour put on the job by the contractor and in general see that the works are carried out in a safe and proper manner and in coordination with other labour and staff employed directly by BHEL or other contractors of BHEL and BHEL's client/ consultant.
14.5	The contractor shall also furnish daily labour report showing by classification the number of employees engaged in various categories of work a progress report of work as required by BHEL Engineer.
14.6	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 co-operate with other personnel, and other contractors, coordinating his work with others and proceed in a manner that shall not delay or hinder the progress of work as a whole.
14.7	The contractor's supervisory staff shall execute the work in the most substantial and workman like manner in the stipulated time. Accuracy of work and aesthetic finish are essential part of this contract. The contractor shall be responsible to ensure that assembly and workmanship conform to the dimensions and tolerance given in the drawing/ instruction given by BHEL Engineer from time to time.
14.8	It is the responsibility of the contractor to engage his workman in shifts or on overtime basis for achieving the target set by BHEL during erection, commissioning and testing period. Contractor's quoted rate shall include all these contingencies.
14.9	For rendering commissioning assistance during running of the unit till handing over of the set, a dedicated gang along with an exclusive supervisor need to be deployed by the contractor to attend the incidental works of commissioning as per the instruction of BHEL commissioning engineer. The gang needs to be provided during night shift also whenever required by BHEL commissioning engineer. They shall be equipped with all necessary hand-tools to attend all the incidental works during commissioning.
15.0	**DEWATERING**
	Contractor shall ensure at all times that his work area & approach/access roads are free from accumulation of water, so that the materials are safe and the erection/progress schedule are not affected. No separate claim in this regard shall be admitted by BHEL. No separate payments for dewatering of subsoil, surface water or catchment water, if required, at any time during execution of the work including monsoon period shall be considered by BHEL.
16.0	**HEALTH, SAFETY & ENVIRONMENT (HSE)**
16.1	Refer Document Number: HSEP:14-SGD Rev.: 02, DATE: 01.09.2020 Document Title: Health, Safety and Environment Plan for Site Operation by Subcontractors for Sagardighi.
17.0	**BONUS (Incentive for Performance and early completion of Contract)**
17.1	Bonus (Performance Incentive, which is different from applicable on Labour Laws) shall be payable to the Contractor for early completion of the total contract with respect to the schedule identified in the contract between BHEL and the sub-contractor only and will not be payable in case of contract extension for any reason whatsoever, irrespective of delay caused by any reason(s).
17.2	Bonus (Performance Incentive) clause implementation shall be independent of BHEL's contract with Customer.
17.3	Bonus(Performance Incentive) for early completion shall be @ 0.25 % of Contract Value for each week of advancement, or pro rata for part thereof, subject to a ceiling of 5% of the contract value.
17.4	The amount of bonus (performance Incentive), if payable, shall be paid with the final bill and for advancement of contract completion schedule and not for advancement of intermediate milestones.
17.5	Contract completion period as specified vide clause No. 35.0 of this TCC shall be considered for application
17.6	Actual completion date should be the date mentioned in the Work Completion Certificate in line with Measurement Book.
17.7	In case of scope inclusion by adding any new system which is not envisaged in the work scope as per tender document or the work scope is reduced by deletion of any

	system which was covered in the tender scope of works; equivalent time for execution schedule of that system will be added or reduced for consideration of Bonus(Performance Incentive) Clause. Execution Time Schedule for such additional scope or deleted scope will be decided by BHEL and that will be accepted by the Vendor without any prejudices.
17.8	Contract value for considering bonus (Performance Incentive) shall be same as defined in LD clause.

17.9	In case of "part withdrawal of work" or "termination of contract" due to any reason or “scope reduction due to downward quantity variation beyond variation limits mentioned in the Quantity Variation clause of the contract”, no bonus (Incentive for performance) shall be applicable.
17.10	Vendors / Bidders not accepting the delivery/ completion schedule as specified vide clause no 35.0 of this tender shall be rejected by BHEL.
18.0	**REVISION ON ACCEPTED CONTRACT RATE**
	Not applicable in this tender.
19.0	**QUALITY CONTROL & QUALITY ASSURANCE**
19.1	**INSPECTION & FIELD QUALITY ASSURANCE**
19.1.1	Contractor shall carry out all activities conforming to the approved Field Quality Plan (FQP) & technical instructions as revised from time to time. ‘Total Quality’ shall be the watchword of the work and contractor shall strive to achieve the quality standards, procedures laid down by BHEL. He shall follow all the instructions as per BHEL drawings and quality standards. Contractor shall provide the services of quality assurance engineer as per the relevant clauses.
19.1.2	Preparation of quality assurance log sheets and protocols with customer / consultants / statutory authority, welding logs, NDE records, testing & calibration records and other quality control and quality assurance documentation as per BHEL engineer’s instructions, is within the scope of work / specification. These records shall be submitted to BHEL / customer for approval from time to time.
19.1.3	The protocols between contractor and customer / BHEL shall be made 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 and to avoid accumulation and multiplication of errors.
19.1.4	A daily log book (with proper indexing) should be maintained by every supervisor / engineer of contractor, for respective area of work, on the job for detailing and incorporating alignment/ clearance / centering / levelling readings and inspection details of various equipment, etc. This log book shall be always accessible to BHEL engineers. High pressure welding (as applicable under the scope of this contract) 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 (as applicable under the scope of this contract) 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 (as applicable under the scope of this contract) performed shall be maintained as prescribed by BHEL.
19.1.5	The contractor has to take prior permission / approval before deployment of NDE & Heat Treatment agencies at site as per BHEL document no. PP-QLY-AA-DC-106/01-20. The contractors employees involved in NDE & Heat treatment job must be qualified & experienced as per the requirement of the above document.
19.1.6	The performance of welders (as applicable under the scope of this contract) will be reviewed from time to time as per the BHEL standards. Welders’ performance record shall be furnished periodically for scrutiny of BHEL’s Engineer. Currently, BHEL follows online Welder Performance Monitoring System. Contractor shall extend necessary support, as deemed fit by BHEL site-in-charge, regarding data entry into the system. Corrective action as informed by BHEL shall be taken in respect of those welders not conforming to these standards. This may include removal/ discontinuance of concerned welder(s). Contractor shall arrange for the alternate welders immediately.

19.1.7	Only welders duly authorized by BHEL / customer / consultant after welder qualification test as per ASME Sec-IX / AWS D1.1 (as applicable) shall be engaged on the work. All the welders shall carry identity cards as per the proforma prescribed by BHEL / Customer / Consultant. High Pressure welders and welders of special materail viz. C276, Ti, etc., must be trained & tested by experts from BHEL-WRI/ other units. Necessary infrastructure for welder traning & testing, as per BHEL's instruction, to be arranged by the contractor without any extra cost to BHEL.
19.1.8	Any re-laying or re-termination of cables / re-erection of instruments / recalibration of instruments etc. required due to contractor's mistake and found at any stage inspection, shall be carried out by the contractor at no extra cost. Repair / rectification procedure to be adopted to make any job acceptable shall be subject to the approval of BHEL.
19.1.9	Weekly Quality Review Meeting at site shall be organised by BHEL to discuss quality issues and next weeks inspection plans. Site in-charge of the contractor along with QAEs of the contractor must be present in the meeting with closure report of the issues raised by BHEL in the previous meetings.
19.2	**REQUIREMENT OF ISO 9001**
19.2.1	BHEL: PSER is accredited with ISO 9001 certification and as such this work is subject to various audits to meet ISO 9001 requirements.
19.2.2	The basic philosophy of the Quality Management System under ISO 9001 is to define the organizational responsibility, work as per documented procedures, verify the output with respect to acceptance norms, identify the non-conforming product / procedure and take corrective action for removal of non-conformance specifying the steps for avoiding recurrence of such non-conformities, & maintain the relevant quality records. The non-conformities are to be identified through the conduct of periodical audit of implementation of quality systems at various locations/stages of work. Suppliers / vendors of various products / services contributing in the work are also considered as part of the quality management system. As such the contractor is expected not only to conform to the quality management system of BHEL but also it is desirable that they themselves are accredited under any quality management system standard.
19.2.3	BHEL reserves the right to carry out quarterly quality audits and quality surveillance of the systems and procedures of contractor’s quality management. Contractor shall provide all necessary assistance to enable BHEL to carry out such audit & surveillance.
19.2.4	Quality audits / approval of the results of test & inspection will not prejudice the right of BHEL to reject an equipment service not giving desired performance and shall not in no way limit the liabilities and responsibilities of the contractor in earning satisfactory performances of equipment / service as per specification.
19.3	**MMEs / MMRs**
19.3.1	Contractor shall ensure deployment of reliable and calibrated MMEs (Measuring and Monitoring Equipment). The MMEs 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 MMEs so that work does not suffer when the particular equipment / instrument is sent for calibration. Also

	if any MMEs 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 MME and retake the readings at Contractor's cost.
19.3.2	Contractor shall provide all the Measuring Monitoring Equipment (MMEs) required for completion of the work satisfactorily. These MMEs shall be of brand, quality and accuracy specified by BHEL Engineer and should have necessary calibration and other certificates as per the requirement of BHEL Engineer. Decision of BHEL Engineer regarding acceptance or otherwise of the measuring instruments / gauges / tools for the work under this specification, is final and binding on the contractor. BHEL shall give an indicative list of MMEs required for this work else where in this contract and to be made available by the contractor. The list will be reviewed by BHEL site as per the requirement of approved FQPs and the contractor shall meet any augmentation needed wherever required.
19.3.3	It is the responsibility of the contractor to prove the accuracy of the testing / measuring / calibrating equipment brought by him based on the periodicity of calibration as called for in the BHEL's quality assurance standards/BHEL Engineer's instructions.
19.3.4	Re-work necessitated on account of use of invalid MMEs shall be entirely to the contractor's account. He shall be responsible to take all corrective actions, including resource augmentation if any, as specified by BHEL to make-up for the loss of time.
19.3.5	In the courses of erection, it may become necessary to carry repeated checks of the work with instruments recently calibrated, re-calibrated. BHEL may counter / finally check the measurements with their own MMEs. Contractor shall render all assistance in conduct of such counter / final measurements.
19.4	**INSPECTION BY TS / FES / QA ENGINEERS OF BHEL UNITS / ENGINEERING CENTRES**
19.4.1	Apart from day-to-day inspection by BHEL Engineers stationed at Site and Customer's Engineers, stage inspection of equipment under erection and commissioning at various stages may also be conducted by teams of Engineers from Field Engineering Services of BHEL's Manufacturing Units, Quality Assurance teams from Field Quality Assurance, Unit/Factory Quality Assurance and Commissioning Engineers from Technical Services etc. Contractor shall arrange all labour, tools and tackles etc along with proper access for such stage inspections free of cost.
19.4.2	Any modifications suggested by BHEL FES and QA Engineers' team shall be carried out. Claims of contractor, if any, shall be dealt as per applicable clause of the contract, and provided such modifications have not arisen for reasons attributable to the contractor.
19.5	**CONFORMANCE TO THE STATUTORY REQUIREMENTS (AS APPLICABLE UNDER THE SCOPE OF THE CONTRACT)**
19.5.1	The work to be executed under these specifications has to be offered for inspection, at appropriate stages of work completion, to various statutory authorities for compliance with applicable regulations. The work related statutory inspections, though not limited to, are as under: 1) Inspectorate of Steam Boilers and Smoke Nuisance 2) Electrical Inspector 3) Factory Inspector, Labour Commissioner, PF Commissioner and other authorities connected to this project work. The scope includes getting the approvals from the statutory authorities, which includes arranging for inspection visits of statutory authority periodically as

	per BHEL Engineer's instructions, arranging materials for ground inspection, taking rub outs for stamping of the pressure parts / pipes to be offered for inspection, submitting co-related inspection reports, documents, radiographs etc and following up the matter with them. Contractor shall also make all arrangements for offering the Products / Systems for inspection at location, as applicable, to the concerned authority.			
19.5.2	Contractor should be qualified to execute pressure parts & piping work coming under the purview of IBR or Competant Inspecting Authority, for which he should register himself with CIB of state concerned / Competant Inspector. Contractor also should be aware of the latest Boiler regulations and Electricity Act, including the amendments thereof, as applicable under the scope of this contract.			
19.5.3	Contractor shall comply with 'Qualification Tests for welders engaged in welding of Boilers and Steam Pipes under Construction, Erection and Fabrication at Site in India and in repairing Boilers and steam pipes by welding' in line with Chapter XIII of Indian Boiler Regulations-1950, for testing his welders / men / workers, including all associated fees, procedures, required instruments and equipment and their calibration there of. 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, at his cost.			
19.5.4	The following fees shall be excluded from scope of Contractor: 1. Registration Fee as per Regulation 385 of Chapter IX of Indian Boiler Regulations-1950 or Registration Fee as per prevailing statutory boiler regulations. 2. Fees for inspection of Boiler at the site of Construction as per Regulation 395 A, sl no 4 of Chapter IX of Indian Boiler Regulations- 1950. However all other fees like visit fees charged by the Boiler Inspector and other arrangements for his visit or visits till satisfactory completion of work, shall be included in scope of Contractor.			
19.6	**STORAGE & PRESERVATION OF WELDING ELECTRODES & OTHER BHEL-ISSUED MATERIAL**			
19.6.1	The contractor shall be responsible for storage & preservation of welding electrodes & other BHEL-issued materials as per BHEL Storage & Preservation Guidelines / Instructions.			
19.7	**PENALTIES ON VENDORS / SUB-CONTRACTORS AGAINST NON-COMPLIANCE OF QUALITY NORMS**			
Sl. No.	**Nature of Non-compliance**	**Penalty for Domestic Project**	**Penalty for Export Project**	**Remarks**
GENERAL				
19.7.1	Unavailability of QAE deployment schedule (duly approved by BHEL Site) matching with manpower requirement of approved L2 schedule	0.10%	0.10%	Against each RA bill
19.7.2	Unavailability of required number of QAE with proper experience & NDT certification as per the requirement of the Contract	Rs. 1,000.00	$16.00	Per person per day
19.7.3	Not attending quality meeting of BHEL by nominated member of vendor / sub-contractor	Rs. 2,000.00	$32.00	Per meeting
CALIBRATION				

19.7.4	Use of MMEs without valid calibration certificate	Rs. 1,000.00	$16.00	Per equipment per instance
19.7.5	Use of NDT equipment, welding equipment without having valid calibration certificate / condition not as per requirement	Rs. 1,000.00	$16.00	Per equipment per instance
WELDING & NDT				
19.7.6	Unqualified welders carrying out welding / tack welding	Rs. 1,000.00	$16.00	Per welder per instance. (Gatepass of the person shall be withheld)
19.7.7	Not using portable oven for welding consumables	Rs. 500.00	$8.00	Per welder per instance. (The consumables in the oven shall be confiscated)
19.7.8	Not using electrodes pre-baked in baking oven	Rs. 500.00	$8.00	Per instance. (The subject consumables shall be confiscated)
19.7.9	Not using welding consumables of approved make & not using correct type of electrode as per approved EWS / Drawing / WPS	Rs. 1,000.00	$16.00	Per instance. (The subject consumables shall be confiscated)
19.7.10	Non-removal of welding slag and spatters after welding	Rs. 500.00	$8.00	Per joint
19.7.11	Not using NDT equipment as prescribed in the manual / FQP / guidelines / Contract	Rs. 1,000.00	$16.00	Per equipment per instance
19.7.12	Welder doing welding without valid job card	Rs. 500.00	$8.00	Per instance
19.7.13	Discrepancy observed in the weld joints identified by BHEL / Customer for RT vs RT film offered	Rs. 2,000.00	$32.00	per joint
MATERIAL MANAGEMENT				
19.7.14	Non-maintenance of grid pillar marking	Rs. 200.00	$3.00	Per location week
19.7.15	Mismatch of location of material in store area w.r.t. location mentioned	Rs. 500.00	$8.00	Per instance

	in stock register			
19.7.16	Non-compliance of Preservation of material as per storage & preservation manuals	Rs. 1,000.00	$16.00	Per equipme nt
19.7.17	Not offering received material for verification within stipulated time as per contract	Rs. 500.00	$8.00	Per instance
PAINTING & ALLIED WORKS				
19.7.18	Not using primer / paints of approved make and as per Specifications	Rs. 1,000.00	$16.00	Per instance
19.7.19	Painting without proper surface preparation as per approved schedule / drawing / FQP	Rs. 500.00	$8.00	Per instance
PROTOCOLS & LOG SHEETS				
19.7.20	Delay in preparation of Protocols / Logsheets as per approved FQP within 3 days of completion of checks	Rs. 200.00	$3.00	Per protocol per day delay
INSPECTION OF BOUGHT-OUT ITEMS / CONSUMABLES				
19.7.21	Delay in offering inspection of Bought-out Items / Consumables / Aggregates (for items which need site inspection as per approved QP) within 3 days of receipt of material at site	1% of the item value of the LOT	1% of the item value of the LOT	per item per day delay after receipt of material
19.7.22	Delay in submission of required documents (viz. Invoice, Inspection Release Note, COC, MDCC, MTC as the case may be) of Bought-out Items (shop inspection items / consumables) with in 3 days of receipt of material at site.	1% of the item value of the LOT	1% of the item value of the LOT	per item per day delay after receipt of material
NOTE: Any non-conformity requiring dismantling / rework, attributable to vendor / sub-contractor, shall be penalised at a rate mentioned above or cost to BHEL, which ever is higher.				

20.0	**FACILITIES TO BE PROVIDED BY BHEL/ CUSTOMER**
20.1	**LAND**
20.1.1	Availability of land within plant boundary is very limited and the contractor has to plan and use the existing land considering the use of land by other Civil /mechanical/ electrical contractors and the storage of plant machineries and materials. The existing land shall be shared by all erection agencies. Land will be allocated with certain time frame and to the extent available/ considered necessary, and will be reviewed by BHEL depending upon the area availability.
20.1.2	Land, as available, may be provided for labour colony by BHEL / WBPDCL. The contractor should visit the site to assess the site condition regarding feasibility of use of land for the purpose. The contractor to construct temporary labour colony / hutment as per his requirements after obtaining approval of formalities from statutory body
20.1.3	The contractor shall provide adequate overhead water tank with minimum 20 nos. tap in their labour colony for drinking/washing purpose. One no cemented area of suitable width, length, with tap (s) for washing purpose also to be provided.
20.1.4	The contractor shall provide minimum 20 nos of toilet in their labour colony.
20.1.5	The contractor will be responsible for handing back all lands, as handed over to him by BHEL/ WBPDCL.

20.2	**WATER**
20.2.1	Construction and drinking water, if available, will be provided to the contractor free of cost at one location within 700 m from the work area. However, additional water source if required may have to be arranged by Bidder as per requirement of work at site with necessary permission from BHEL/WBPDCL within the quoted price.
20.2.2	Further necessary network for construction & drinking water system shall be done by the bidder at his own cost.
20.2.3	Contractor should arrange on their own, drinking water in their labour colony.
20.2.4	BHEL shall not be responsible for any inconvenience or delay caused due to any interruption of water supply and the contractor shall claim no compensation for delay in work for such interruption. Contractor may make standby arrangement for water for which no separate payment shall be made by BHEL.
20.2.5	Contractor will have to arrange for storage of water to meet the day-to-day requirement. Bidder will ensure adequate supply of construction water to meet the requirement of water during major concreting.
20.2.6	The availability of water (construction as well as drinking) in project site may be limited. Contractor shall ensure that no water is wasted. In this regard the contractor shall take all necessary measure towards preservation of water.
20.3	**ELECTRICITY/CONSTRUCTION POWER**
	CONSTRUCTION POWER & GENERAL ILLUMINATION NETWORK
20.3.1	BHEL Shall Provide Construction Power free of charges at 415V level at Two points within 500 M from his work place and bidders has to make his own distribution arrangement to draw electricity. Provision of suitable temporary lights at different floors/working areas for execution of the work & safety of workmen shall be provided by the vendor, within the quoted rate. The illumination should be such that minimum illumination requirement as specified by Indian standards for general illumination is maintained.
20.3.2	GENERAL
	If any other voltage level (other than normally available) is required, the same shall be arranged by the contractor from power supply as above. Contractor will have to provide at his own cost necessary calibrated energy meters (tamper proof, suitably housed in a weather proof box with lock & key arrangement) at point of power supply along with calibration certificate from authorized / accredited agency for working out the power consumption. In case of recalibration required for any reason the necessary charges including replacement by calibrated meters is to be borne by the contractor. Supply of electricity shall be governed by Indian Electricity Act and Installation Rules and other Rules and Regulation as applicable. The contractor shall ensure usage of electricity in an efficient manner and the same may be audited by BHEL time to time. In case of any major deviation from normally accepted norms is observed, BHEL will reserve the right to impose penalty as deemed fit for such cases.
20.3.3	The bidder shall have to provide earth leakage circuit breaker at each point wherever human operated electrical drives/ T&Ps are deployed.
20.3.4	The power supply will be from the available grid. BHEL shall not be responsible for any inconvenience or delay caused due to any interruption of power supply/ variation in voltage level and no compensation for delay in work can be claimed by the contractor due to such non-supply on the grounds of idle labour, machinery or any other grounds.
20.3.5	Bidder will have to arrange sufficient illumination at their own work areas.
20.3.6	The contractor should ensure that the work in critical areas is not held up in the event of power breakdown and during power break down, vendor will use their own DG set for continuation of job. If the progress of work is hampered owing to interruption in power supply, it will be the responsibility of the contractor to step up the progress of works that overall progress of work is not affected.
20.3.7	The contractor shall have to make arrangement at their own cost for illumination that will be required in the working area for execution of the work & safety of workmen.
20.3.8	Though the construction power is provided free of charge, it is the responsibility of the vendor to ensure efficient utilization of the electricity. Suitable audit shall be

	carried out jointly by BHEL & vendor on a periodic basis to ensure the same. In case at any point of time it is found that construction power is being used inefficiently or for any other purpose than the intended use, the vendor will be suitably penalized as per the provision of the contract. The maximum penalty that can be imposed on the vendor shall be limited to one month's electricity charges (as will be obtained from the energy meter at drawing points) per incident of inefficient use or misuse.
21.0	**FACILITIES TO BE PROVIDED BY THE CONTRACTOR**
21.1	All tools and tackles, machinery, equipment, instruments required for the work have to be arranged by the contractor including its transportation before and after work and including storage, insurance etc.
21.2	The contractor shall provide all required tools and plants, inspection, measuring and test equipment and handling & transportation equipment for the scope of work covered under these specifications. Some of the major T&Ps to be necessarily provided by the contractor is listed in relevant Appendix-III of this tender. BHEL will provide the services of their T&Ps listed vide relevant Appendix-IV of this tender, free of charge, on sharing basis.
21.3	All tools and tackles to be deployed by the contractor for the work shall have the prior approval of BHEL / Customer.
21.4	Contractor shall provide all the necessary scaffolding materials, temporary structures, as may be required and necessary safety devices etc.
21.5	Cleanliness and housekeeping to be done on regular basis and it is the responsibility of the vendor.
21.6	Timely deployment of adequate quantity of T&P is the responsibility of the contractor. The contractor shall be prepared to augment the T & P at short notice to match the planned program and to achieve the milestones.
21.7	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.
21.8	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.
21.9	The T & P to be arranged by the contractor shall be in proper working condition and their operation shall not lead to unsafe condition. The movements of cranes, and other equipment should be such that no damage / breakage occurs to foundations, other equipment, material, property and men. All arrangements for the movement of the T & P etc., shall be the contractor's responsibility.
21.10	The contractor shall arrange adequate nos. of wooden sleepers/steel plates for crane movement and material stacking near work site failing which BHEL may get the same done at their risk & cost.
21.11	For welding, no joint in the welding cable is allowed.
21.12	The contractor at his cost shall carry out periodical testing of his construction equipment and calibration of measuring instruments (MMDs) and tests. Test/ calibration certificates shall be furnished to BHEL. MMDs shall be calibrated only at accredited laboratory as per the list available with BHEL or any other laboratory approved by BHEL.
21.13	SITE/ FIELD OFFICE AND STORES
21.13.1	The contractor shall make his own arrangements for Site/field office and stores for accommodating necessary equipment, tools room for execution of the work. Only open space will be provided by BHEL / customer, free of charges within the project premises as per the availability of space.
21.13.2	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.
21.13.3	For the stored materials at outdoor locations; indicative barriers are to be provided by using barrier-indicator and it is included in the scope of vendor including supply

	of required items.
21.14	AREA LIGHTING
	Contractor shall arrange adequate floodlights, hand lamps and area lighting. Provision of distribution lines for lighting from the single point to the required place with proper distribution boards, observing the safety rules laid down by the electrical authorities of the state shall be done by the contractor. Contractor shall use his own materials like cables, fuses, switchboards etc.
21.15	RESPONSIBILITIES WITH REGARD TO EMPLOYMENT OF LABOUR ETC
21.15.1	Recruitment of Local Labour: Local labours shall be engaged for unskilled work. Preference may also be given for appointment of local people in semiskilled and skilled categories, if such suitable persons are available.
21.15.2	Labour Laws and Local Regulations: The Contractor shall abide by the prevailing labour laws and shall have to obtain labour license from the appropriate authority as per the law at his cost and shall indemnify the Purchaser about his financial and other obligations arising out of labours/workers employed by him. On obtaining the labour license, the Contractor at appropriate time shall submit certified photocopy of the same to the Purchaser. The Contractor and its sub contractor (s) shall possess valid PF & ESI Code.
21.15.3	Wages and Working Hours: The Contractor shall pay rates of Wages and observe hours and conditions of labour not less favourable than those established for the trade or industry in the district where the work is carried out but not less than the applicable minimum wages or by machinery of negotiation or arbitration to which the parties are organizations of employers and trade union's representatives respectively of substantial proportions of the employers and workers engaged in the trade or industry in the district. In the absence of any rates of Wages, hours or conditions of labour so established the Contractor shall pay rates of wages and observe hours and conditions of labour which are not less favorable than the general levels of wages and hours and conditions observed by other contractor whose general circumstances in the trade or industry in which he is engaged are similar.
21.15.4	Contractor to furnish return of labour employed: The Contractor shall, if required by the Engineer, deliver to the Engineer or to his office a return in such form and at such intervals as the Engineer may prescribe showing in detail category-wise number of classes of labour from time to time employed by the Contractor on the Site and such information respecting construction machinery as the Engineer may require.
21.15.5	The Contractor shall make his own arrangements for the engagement of all labour and provide on the Site in so far as the Contract otherwise provides, for the transport, housing, feeding and payment thereof. The Contractor shall, so far as is reasonably practical, having regard to local conditions, provide on the Site, to the satisfaction of the Engineer an adequate supply of drinking and other water for the use of his staff and labour.
21.15.6	Other Requirements: a) The Contractor shall not, otherwise than in accordance with the Statutes, Ordinances and Government Regulation or Orders for the time being in force, import, sell, give, barter or otherwise dispose of any alcoholic liquor, or drugs, or permit or suffer any such importation, sale, gift, barter or disposal by his sub-contractor(s), agents of employees. b) The Contractor shall not give, barter or otherwise dispose of to any person or persons any arms or ammunition of any kind or permit the same as aforesaid. c) The Contractor shall in all dealings with labour in his employment have a due regard to all recognised festivals, days of rest and religious or other customs. d) In the event of any outbreak of illness of an epidemic nature, the Contractor

	shall comply with and carry out such regulations, orders and requirements as may be made by the Government, or the local municipal or sanitary authorities for the purpose of dealing with and overcoming the same. e) The Contractor shall at all times take all reasonable precautions to prevent any unlawful riotous or disorderly conduct by or amongst his employees and for the preservation of peace and protection of persons and property in the neighborhood of the Site against the same. f) The Contractor shall be responsible for observance by his sub-contractor(s) of the foregoing provisions.
21.15.7	Contractor shall deploy only qualified and experienced engineers/ supervisors. They shall have professional approach in executing the work.
21.15.8	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.
21.15.9	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.
21.15.10	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.
21.16	COMMUNICATION
	The contractor shall be responsible for arranging all communication facilities for himself at site. The contractor has to establish independent internet/ e-mail facilities with mobile connection for all key site personnel and same shall have to be integrated with BHEL’s voice/ data network and database systems at site.
21.17	CLEANLINESS
21.17.1	The contractor shall be responsible for keeping the entire area allotted to him clean and free from rubbish, debris etc. during the period of contract. The contractor shall employ enough number of special personnel to thoroughly clean his work-area at least once in a day. All such rubbish and scrap material shall be stacked or disposed in a place to be identified by BHEL/ customer. Materials and stores shall be so arranged to permit easy cleaning of the area. In areas where equipment might drip oil and cause damage to the floor surface, a suitable protective cover of a flame resistant, oil proof sheet shall be provided to protect the floor from such damage.
21.17.2	Similarly the labor colony, the offices and the residential areas of the contractor’s employees and workmen shall be kept clean and neat to the entire satisfaction of BHEL/Customer. Proper sanitary arrangements shall be provided by the contractor, in the work-areas, office and residential areas of the contractor.
21.17.3	Bidders to note that following.
21.17.4	No staff quarter shall be provided by BHEL.
21.17.5	All site execution approaches required for movement of cranes, trailers, trucks, dumpers, etc shall be arranged by the contractor at his own cost.
21.17.6	The contractor shall solely be responsible for the safety, quality & quantity of material after it is handed over and issued to contractor by the BHEL.
22.0	**PROJECT MANAGEMENT**
22.1	The bidder shall prepare detail schedule L1/ (L-2) for Boiler pkg including ESP, FGD & SCR and submit within 15-days of LOI for BHEL approval, as per MILESTONE completion schedule given in this document. This schedule must include all milestone and key activities for each package/ sub-systems/ components in his scope of work in the areas of mobilization, erection, commissioning, handing over etc.
22.2	The contractor shall furnish an offer stage master network/ bar chart (L1 schedule) for Boiler in accordance with the project milestone schedule. The contract master bar

	chart will be negotiated with the successful bidder.
22.3	The successful contractor shall prepare and maintain the detailed master schedule (L2 network) for Boiler during the course of the work.
22.4	Theses network must conform to the overall requirement of the project schedule as detailed below. The bidder should also ensure monitoring of these activities at least on weekly basis to start with and on daily basis whenever required by BHEL.

22.5	**Project milestones:** **Schedule for major construction activities covered under the scope of work is as below.** **Major activity description**	**Time period w.r.t. start of work against confirmation from BHEL**
22.5.1	Mobilization	15 days from date of written confirmation from BHEL
22.5.2	Boiler Erection Start	1st Month
22.5.3	Boiler Hydro Test- drainable	20th Month
22.5.4	Boiler Hydro Test- nondrainable	24th Month
22.5.5	Boiler Light Up (BLU)	25th Month
22.5.6	ESP Readiness	24th Month
22.5.7	SCR Readiness	24th Month
22.5.8	FGD commissioning	33rd month
22.5.9	Steam Blowing Completion	26th Month
22.5.10	Safety Valve Floating	27th Month
22.5.11	Oil Synchronization	28th Month
22.5.12	Coal Firing and Full load operation	31st Month
22.5.13	Completion of Trial Run	32nd Month
22.5.14	Completion of Facilities	35th Month
22.5.15	Completion of PG Test	38th Month
22.7	COMPUTER INFRASTRUCTURE	
	The successful bidder will have to establish computerized project management system and the following are the essence of the system.	
22.7.1	Bidder will have to install 02 (two) no PC (multimedia PC work station having minimum Intel Corei5 processor, 3.6 GHZ or above, 500 GB HDD, 4 GB RAM, 100 MBPS LAN card or above of HP/LENOVO/DELL or equivalent make with Windows 7 or higher O/S with TFT/LCD Monitor of minimum 21" & required software like MS Office 2010 Professional, AutoCAD 2010, PageMaker (7.0 etc), ADOBE PDF CREATOR (version 10.0), DVD Writer with 01 (One) no. laser jet printer compatible for A3 size printing(ink/cartridge for which to be supplied as and when required, for estimation of the bidder, the consumption may be assumed as 1 cartridge per 2 month) & 02 (two) no laser jet printer compatible for A4 size printing (ink/ cartridge for which to be supplied as and when required, for estimation of the bidder, the consumption may be assumed as 1 cartridge per month) with an UPS of APC or Microtech make for power backup at places, as per instruction of BHEL for exclusive use of BHEL. Besides these, 01 (one no. Data Card (Modem) with minimum 3.5 Mbps speed having minimum 10 GB monthly Plan of any reputed Service Provider to be provided by the Vendor per Computer at his cost till work completion for exclusive BHEL use. These PCs/Printers/UPS/Modem shall remain contractor's property and they will be allowed to be taken out after total completion of the site works & placement of Final Bill. The contractor shall provide data/information etc in prescribed formats for periodical updating of the progress reports, material management reports, updating of network pertaining to the contractor's scope of work etc. The contractor shall also provide 02 (two) nos. computer operator and 03 (Three) nos. support service staff for miscellaneous service for BHEL's use at Site/Kolkata for reconciliation, progress review & day-to-day planning &, documentation purposes etc. This facility to be provided as per instruction of BHEL Construction Manager and must be effected within Ten days from the date of written instruction issued by BHEL site Authority and the facilities shall be extended till completion of site works or as decided by BHEL. If contractor fails to provide computer/ printer or personnel as per requirement, for a continuous period of fifteen days or more, BHEL shall have the right to deduct the amount as per following rates on pro-rata basis, from contractor's RA bill or any other dues.	
22.7.1.1	@ Rs 18,000/- (Eighteen thousand)/ month for each computer operator.	
22.7.1.2	@ Rs 8,000/- (Eight thousand)/ month for each computer.	
22.7.1.3	@ Rs 4,000/- (Four thousand)/ month for each printer.	

22.7.1.4	@ Rs 13,000/- (Thirteen thousand) / month for each Support service staff.
22.7.2	In the event of the contract period getting extended beyond the stipulated time for reasons not attributable to the bidder, the bidder will be reimbursed at the following rates :
22.7.2.1	@ Rs 18,000/- (Eighteen thousand)/ month for each computer operator or at actuals if BHEL arranges this facility, whichever is lower.
22.7.2.2	@ Rs 8,000/- (Eight thousand)/ month for each computer or at actuals if BHEL arranges this facility, whichever is lower.
22.7.3	@ Rs 4,000/- (Four Thousand) / month for each printer or at actuals if BHEL arranges this facility, whichever is lower.
	@ Rs 13,000/- (Thirteen Thousand) / month for each support service staff or at actuals if BHEL arranges this facility, whichever is lower.
22.7.4	The contractor's site office must have facilities of communications like Fax, E-mail, and telephone with STD facility within a month from LOI.
22.8	GENERAL
22.8.1	The contractor shall be responsible for planning and scheduling the work and reporting its progress in a manner, format and level of detail acceptable to BHEL. These plans shall be in accordance with the intermediate milestones and the completion dates as specified by and agreed in the contract.
22.8.2	The contractor shall be responsible for reporting progress to purchaser on a weekly and monthly basis. Progress reports shall be presented in a clear and logical fashion preferably through a software disc and in PDS format mutually agreed between BHEL and contractor.
22.9	DETAILED MASTER SCHEDULE (L2 NETWORK)
22.9.1	Within fifteen (15) days of the letter of intent date, contractor shall submit to BHEL the detailed master schedule (L2 schedule) along with summary network/ bar chart (L1 schedule) for approval. L2 schedule shall be the working level document demonstrating contractor's ability and methods of completing the work within the key milestones identified in the tender specification.
22.9.2	The CMS shall be based on a computerized logic network. The level of detail shall be sufficient to break down the work scope into manageable and measurable activities acceptable to BHEL. All activities shall have durations in days.
22.9.3	The contractor shall provide a detailed activity bar chart based on the resource scheduled logic network. The bar chart shall contain activity descriptions, planned start and finish dates with the critical path activities clearly identified. The network / bar chart shall be updated weekly to indicate actual progress.
22.9.4	The CMS shall include the required dates of all external input required to execute the plan. In addition the CMS shall clearly show all sub-contract award dates and sub-contractor activities right from preparation of specification & floating of tender.
22.9.5	In addition contractor shall furnish percentage - based progress 'S' curve indicating, the required rate of progress necessary to complete the work according to the CMS. The 'S' curve shall be updated weekly to plot actual progress against planned.
22.10	PROGRESS MEASUREMENT AND MONITORING
22.10.1	The contractor shall measure progress of the work using its own methods and procedures preferably in primavera.
22.10.2	Weekly progress review meetings will be held at site during which actual progress during the week vis-à-vis scheduled program shall be discussed and action to be taken for achieving targets will be decided. For discussions, the contractor shall present program of subsequent week. The contractor shall constantly update/revise his work program to meet the overall requirement.
22.10.3	Periodic progress reviews on the entire activities of execution in respect of engineering, quality, procurement, supply and works in scope of bidder will be held once in a month at Kolkata/ site/ contractor's premise/ BHEL/PMG, Noida or any other convenient premise. These meetings will be attended by reasonably higher officials of the contractor along with its sub-contractors & consultant as applicable and will be used as a forum for discussing all areas where progress needs to be speeded up. The contractor shall be further responsible for ensuring that suitable steps are taken to meet various targets decided in such meetings.
22.10.4	Contractor shall identify separate overall Project Manager, Construction Manager,

	Engineering Manager, Quality Manager and selection of various Key personnel shall be subject to BHEL approval.
22.11	REPORTING
22.11.1	The contractor shall submit weekly progress reports to BHEL in the agreed formats submitted in adequate number of signed originals. The report shall include following.
22.11.1.1	Brief narrative of work performed during the week.
22.11.1.2	CMS bar chart showing progress at activity level.
22.11.1.3	Updated progress 'S' curves showing actual progress.
22.11.1.4	Milestones achieved and new activities started.
22.11.1.5	Status of critical activities.
22.12	The contractor shall submit monthly progress reports to BHEL in the agreed formats submitted in adequate number of signed originals. The report shall include the weekly report content and shall be supplemented with the following.
22.12.1	Status of Civil Input
22.12.2	Man-Power status
22.12.3	T&P status with report of break-down (if any).
22.12.4	Materials issue Status
22.12.5	Material Consumption status.
22.12.6	Erection & commissioning status.
22.12.7	Safety report.
22.12.8	Change order status.
22.12.9	Updated CMS (L1/L2 schedule) indicating status.
22.12.10	Executive summary, areas of concern etc.
22.12.11	Progress photographs in digital format.
22.13	SUBMISSION OF PERIODICAL REPORTS
22.13.1	Contractor shall submit periodical reports in respect of following aspects of operation.
22.13.1.1	Consumption of consumables like welding electrodes, gases and paints.
22.13.1.2	Consumption of construction power
22.13.1.3	Availability and utilization of BHEL 's tools & plants
22.13.1.4	Availability and utilization of contractor's tools & plants
22.13.1.5	Daily manpower reports
22.13.1.6	Daily progress reports of activities & incidents
22.13.1.7	Test calibration reports
22.13.1.8	Records of wages , EPF payment.
22.13.1.9	BHEL/ client may specify any other report/record as required.
22.13.1.10	Record of protocol/ log sheet
22.13.2	Adequate numbers of color photographs, in soft form, (for each area per month of the contract execution period), depicting progress of the work or damage to the machine parts, if any, as directed by BHEL site engineer is to be arranged by the successful bidder at his own cost.
22.13.3	The progress report shall be compiled in computer and is required to be furnished over "E Mail", in addition to hard copies and summary report shall be made 'Web enabled' in agreed format.
23.0	**CONSUMABLE**
23.1	All consumables, like gas, electrodes, chemicals, lubricants etc. required for the scope of work, shall be arranged by the successful bidder at their cost, except for those which BHEL shall provide free of cost as per tender (If applicable). A tentative list of consumables to be provided by successful bidder is given in the relevant annexure of this tender. However, this list is not exhaustive & successful bidder have to provide all consumables for proper completion of the job.
23.2	All consumables to be used for the job shall have to be approved by owner/ BHEL prior to use as regard their brand & quality specifications. Test reports/ certificates in respect of these consumables, wherever applicable, shall be submitted to BHEL engineer.
23.3	In the event of failure of successful bidder to bring necessary and sufficient consumables, BHEL may arrange for the same at the risk and cost of successful bidder. The entire cost towards this along-with overhead shall be paid by successful bidder or deducted from successful bidder's bills.

23.4	All the required welding electrodes as approved by BHEL shall be arranged by successful bidder at his cost. It shall be the responsibility of successful bidder 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 & 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.
23.5	BHEL reserve the right to reject use of any electrodes, if found non-acceptable because of bad quality, deterioration in quality due to improper storage, shelf life expiry, unapproved type/ band etc.
23.6	Filler wires, for tig welding of pressure parts & piping to the extent supplied by the manufacturing units of BHEL along with the components/ equipment only shall be provided by BHEL free of cost. Successful bidder shall at their cost meet requirements of TIG filler wires, if any, beyond these free issue of BHEL.
23.7	All the required gases like argon, oxygen, acetylene etc. shall be arranged by the successful bidder at their cost. Nitrogen gas, if required, for chemical cleaning/ preservation of boiler and piping system will be provided by BHEL free of charge.
24.0	**MMD**
	The contractor shall ensure deployment of reliable & calibrated instrument, measuring and test equipment (MMD). The MMD shall have test/ calibration certificate from authorised/ Govt. approved agencies. The contractor shall also keep provision of alternate arrangement for such MMD so that the work does not suffer when a particular MMD is sent for calibration. Re-testing/ re-calibration shall also be arranged by the contractor at their own cost at regular interval during the period of use as advised by BHEL.
25.0	**CRANES AND T&Ps TO BE PROVIDED BY BHEL**
25.1	BHEL will make available the crane (as per relevant appendix of this tender) with fuel and operators free of charges as applicable, to the contractor mainly for the purpose of pre-assembly and erection of components. The Crane shall be available for (14) fourteen hours inclusive of one hour lunch break daily, excluding Sundays and scheduled Holidays. For Crane working beyond normal working hours or on Sundays /Holidays, prior permission of the BHEL Site In-charge/ Construction Manager is to be obtained. However, BHEL Site In-charge/ Construction Manager's decision in this regard will be final after judging the proficiency of the contractor's crane requirement.
25.2	The allocation of cranes shall be the discretion of BHEL Site In-charge/ Construction Manager, which shall be binding on the contractor.
25.3	All arrangements, including providing & laying of sleeper beds, back-filling of approaches wherever necessary for safe movement of the cranes as directed by BHEL shall be the responsibility of the contractor. The contractor shall provide sleepers for this purpose at his cost.
25.4	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 and to be done with contractor's own T&P ,cranes, consumables and manpower.
25.5	For unloading/loading of BHEL Cranes during mobilization / demobilization process, some assistance in the form of manpower with some hand tools may be required. On necessity, vendor shall render this assistance within his quoted price. However, if Crane facility is required in the process, BHEL shall issue their 75 T Crawler Crane / other available crane free of any charges for this purpose only.
25.6	Major breakdowns will be attended to by BHEL. The cranes provided by BHEL will be withdrawn for regular and capital maintenance as per the respective schedule of maintenance. As far as possible such schedules will be intimated to the contractor in advance and may be adjusted depending on the work requirements at site. However no claim whatsoever will be entertained on account of non-availability of cranes.
25.7	Where the services of the cranes provided by BHEL are to be availed by different agencies/ contractors of BHEL, the contractor's responsibilities defined above will also be apportioned accordingly to the beneficiary agency. BHEL engineer will do working arrangements in this regard at site and in any case his decision shall be final and binding.
25.8	The machineries as prescribed in relevant Appendix will be provided to contractor on

	free of cost basis on availability. The list is only indicative and BHEL shall provide these subject to availability. The cranes will be provided to contractor with fuel and operator and free of any hire charges basis.
25.9	Loading of materials at BHEL stores shall be done by the contractor using his cranes.
26.0	**OTHER T & Ps**
26.1	The responsibilities of contractor defined above for BHEL cranes shall also be applicable, in respect of other tool & plants provided by BHEL.
26.2	Special tools which are supplied by BHEL as part of maintenance tools to be handed over to customer under regular DU numbers in various product groups may be issued to the contractor free of charges for specific activities, at the discretion of BHEL. Contractor shall return them after the completion of the specific activity for which the tools were spared, in good working order.
26.3	BHEL shall provide one passenger elevator for Boiler, free of any charges. Erection and commissioning of the Elevators shall be in the scope of the vendor. In the event vendor is not able to erect and commission the elevators, they may take the help of original equipment manufacturer details of which may be obtained from BHEL. Day to maintenance of the elevators will be in the scope of the vendor.
26.4	Lubricants like engine oil, cadmium compound, hydraulic oil, gear oil, grease for BHEL's T&Ps including cranes will be provided by BHEL free of charge. Similarly filters for cranes will be provided free of charge by BHEL.
26.5	The contractor must not use these equipment for any purpose other than what they are intended for.
26.6	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.
27.0	**TEST CERTIFICATE FOR T&P**
27.1	All T&P, lifting tackles and pulling devices to be deployed by the contractor must bear valid/ latest test certificates for their suitability and the documents shall be preserved at site.
27.2	In case of expiry of validity of any such test certificate during construction, the contractor shall arrange for revalidation of the same well in advance, so that the construction activities do not suffer on account of non-availability of such Test certificates.
27.3	The contractor should also submit to BHEL for approval a list of T&Ps along with their fitness certificates. The tools & tackles shall not be removed from site without written permission of BHEL.
28.0	**ISSUE OF T&Ps**
28.1	Deployment of all T&Ps for this tender shall be contractor's responsibility. However, if BHEL issues any T&Ps, the same shall be on chargeable basis as per BHEL norms unless otherwise specified.
28.2	In the event of BHEL issued T&Ps, measuring instruments etc, contractor and BHEL shall maintain joint protocol about the condition of all T&P, instruments etc taken from BHEL's custody and return to BHEL after use. The contractor shall not use these equipment for purposes other than the scope of work given in this tender document.
28.3	It is the responsibility of contractor to keep these equipment always in working condition and ensure their safe return in working condition to BHEL's store subject to normal wear & tear.
28.4	After use of T&P items issued by BHEL the same shall be returned to BHEL in good working condition subject to normal wear & tear failing which recoveries at the book value of the item or the market rate prevailing at the time of returning the items, whichever is higher shall be made from the payments due to the contractor from BHEL from this contract or from any other contract.
28.5	It is not obligatory on the part of BHEL to provide any tools and tackles or other materials other than those specifically agreed to do so by BHEL. However, depending upon the availability, BHEL / BHEL's Customer handling equipment and other plants may be made available to the contractor on payment of higher charges as fixed, subject to the conditions laid down by BHEL/Customer from time to time. Unless paid in advance, such hire charges, if applicable shall be recovered from contractor's bill /security deposit or any other payment in one installment.

29.0	**AREA REQUIREMENT**
	The contractor shall furnish the estimated area required for the construction of his office, stores, etc separately. The same will be reviewed by BHEL and allotted to the extent available/ considered necessary, depending upon the area availability.
30.0	**CONSTRUCTION OF TEMPORARY OFFICE, STORES ETC**
	The contractor shall arrange at his own cost the construction of his temporary office, stores, fabrication yards, labour colony etc and also the watch & ward of all above.
31.0	**RECONCILIATION OF MATERIALS**
31.1	Contractor shall submit a reconciliation statement of material after completion of job.
31.2	The contractor shall return the unused plant materials under their custody to BHEL's store/ yard at their own cost.
32.0	**SECURITY DEPOSIT (SD) AND PERFORMANCE BOND (PB)**
32.1	As per relevant clause of GCC.
32.2	Performance bond is not applicable for the tender.
33.0	**INSURANCE**
33.1	BHEL shall arrange comprehensive MCE (marine cum erection) Insurance Policy for total project supply & services including balance of plant package covering transit risks & loss, destruction or damage during handling at Site, Storage, civil works ,erection, testing and commissioning up to trial operation completion of unit including theft, sabotage, fire, lightning and other natural calamities.
33.2	Contractor shall report to BHEL in writing any damages to equipment/components on receipt, storing, and during withdrawal of the materials from stores, in transit to site and unloading at place of work and during erection and commissioning till trial operation completion including handing over. 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.
33.3	The contractor will take necessary precautions/ due care to protect the material at Project site, while in his custody from any damage/ loss till the same is handed over to BHEL/ customer at Project site. For lodging/ processing of insurance claim the contractor will submit necessary documents. BHEL will reserve the right to recover the loss from the contractor as detailed below in case the damage/loss is due to negligence/ carelessness on the part of the contractor. In case of theft of material under contractor's custody, the same shall be reported to police by the contractor immediately and copy of FIR and subsequently police investigation report shall be submitted to BHEL/ customer for taking up with insurance. However, this will not relieve the contractor of his contractual obligation for the materials in his custody.
33.4	In case the damage/loss/theft of materials are attributable to negligence/failure in discharging the duties and obligations of the contractor, the expenses incurred for repair/replacement of such components in excess of the amount realized from the underwriters, limited to Normal Excess (Deductible Franchise) shall be recovered from the contractor.
33.5	Other conditions of Insurance shall be as per relevant clause of GCC/SCC.
34.0	**REPORTING DAMAGES AND CARRYING OUT REPAIRS**
34.1	Checking all components / equipment at siding/site and reporting of any damages / losses will be in the scope of contractor. Necessary assistance for verification / survey and lodging claims with underwriters and follow up to logical conclusion will also be part of this contract.
34.2	Contractor shall render all help to BHEL in inspection including handling, opening packages, re-packing, 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.
34.3	Contractor, shall report to BHEL in writing any lost/damages to equipment / components during drawl of the materials from stores, in transit to site and unloading at a 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 noncompliance of this stipulation will be borne by contractor.
34.4	Contractor shall carry out fabrication of any material lost /damages as per Instructions

	from BHEL Engineer.
34.5	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.
34.6	All repairs/ rectification/ rework of damages & fabrication of materials lost, if any, shall be carried out by a separately identifiable gang for certification of man-hours. Daily log sheets shall 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 acceptance of these as extra works for payment purpose.
34.7	All rectification, repairs, reworks and fabrication of components lost, which are minor and incidental to erection work (consuming up to 100 man-hours on each occasion) shall be treated as part of work without any extra cost.
34.8	Insurance cover under this policy will be as per relevant clauses of GCC.
34.9	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 prorata basis and the decision of BHEL in this regard is final and binding on the contractor.
35.0	**COMPLETION PERIOD**
35.1	The entire work shall be successfully completed in all respect within 38 (Thirty Eight) months from the date of start of work, as certified by Construction Manager, BHEL.
35.2	Successful bidder has to mobilize their man power within 15 days from the date of intimation from BHEL site.
36.0	**CONSTRUCTION SCHEDULE**
36.1	Bidder shall plan activities accordingly to match the milestone schedule enumerated in the tender. However, the stated schedule is indicative and actual milestones shall be finalized during execution at site depending on project's requirement.
36.2	A bar chart showing of various milestones of Boilers & Aux., ESP, FGD & SCR to be submitted by the bidder within 15 days from date of LOI to Construction Manager, BHEL site for approval.
37.0	**TAXES AND DUTIES**
37.1	All taxes excluding GST & BOCW Cess (as specified elsewhere in the tender) but including, Charges, Royalties, any State or Central Levy and other taxes for materials if any obtained for the work and for execution of the contract shall be borne by successful bidder and shall not be payable extra by BHEL.Any increase of above at any stage during execution of contract, including extension of the contract, shall have to be borne by successful bidder contractor. Bidder's quoted/ accepted rates/ price shall be inclusive of all such requirements.
37.2	GST (as applicable) legally leviable & payable by successful bidder as per GST Law shall be paid by BHEL, extra. Hence, bidder shall not include GST (as applicable) in their quoted rates/ price.
37.3	Successful bidder shall furnish proof of GST registration with GSTN Portal covering the services under this contract. Registration should also bear endorsement for the premises from where the billing shall be done by successful bidder on BHEL for this project / work.
37.4	Since GST on output will be paid by BHEL separately as enumerated above, bidder's quoted rates / price should be after considering the Input Credit under GST law at bidder's end.
37.5	TDS under Income Tax shall be deducted at prevailing rates on gross invoice value from the running bills (RA bills) unless exemption certificate from the appropriate authority / authorities is furnished.
37.6.1	You may collect TCS under section 206C(1H) of Income Tax Act, 1961 if applicable.
37.6.2	In case, you collect TCS under section 206C(1H) of Income Tax Act, 1961, following compliance is required.
	a) TAN and PAN of vendor should appear in all invoices/claims. Copy of TAN /TCS registration is to be submitted.
	b) Amount of TCS and Assessable value on which TCS has been calculated should be specified clearly in the invoice.
	c) You shall be required to submit certificate of TCS in Form no. 270 within 15 days from the due date for furnishing the statement of tax collected at the source.

37.6.3	In case, you do not collect TCS under section 206C(1H) of Income Tax Act, 1961, following declaration is to be submitted alongwith each invoice:- *"I/We hereby declare that I/We are not required to collect TCS"* under section 206C(1H) of Income Tax Act,1961, on this bill.
37.6.4	In event of failure to comply with the provisions of the Act, or proper certificate not issued, or if tax collected but not remitted to the Government, or for any other reason and thereby causing loss to BHEL, the same shall be recoverable from the vendor with applicable interest.
37.6.5	You shall comply with all statutory amendment/notifications in this respect.
37.7	TDS under GST shall be deducted at applicable rates on gross invoice value from the running bills (RA bills).
37.8	Bidder shall note that GST Tax Invoice complying with GST Invoice Rules (Section 31 of GST Act & Rules referred thereunder) wherein the 'Bill To' details shall encompass following. BHEL GSTN – Refer attached GSTN code table of BHEL. Name - BHARAT HEAVY ELECTRICALS LIMITED Address - Shall be intimated later. Specific details of BHEL GSTN, Name and Address as stated above, have been specified elsewhere in the tender.
37.9	Successful bidder to intimate immediately on the day of removal of goods (in case of any supply of goods) to BHEL along with all relevant details and send a scanned copy of Tax Invoice to BHEL through following communication mode for enabling BHEL to meet its GST related compliances. Portal address and Email address – Shall be intimated later. Specific details of above shall be intimated to successful bidder by BHEL at appropriate juncture.
37.10	In case of delay in submission of above mentioned documents on the date of despatch, BHEL may incur penalty / interest for not adhering to Invoicing Rules under GST Law. The same will be liable to be recovered from successful bidder, in case such delay is not attributable to BHEL.
37.11	In case of raising any Supplementary Tax Invoice (Debit / Credit Note), successful bidder shall issue the same containing all the details as referred to in Section 34 read with Section 31 of GST Act & Rules referred there under.
37.12	Successful bidder shall comply with the Time Limit prescribed under the GST Law and rules thereof for raising of the Tax Invoice. If any supply of goods is applicable, successful bidder shall also ensure prompt delivery of goods after despatch.
37.13	Bidder shall note that in case GST credit is delayed / denied to BHEL due to delayed / non receipt of goods and / or Tax Invoice or expiry of the timeline prescribed in GST Law for availing such ITC, or any other reasons, not attributable to BHEL, GST amount shall be recoverable from successful bidder along with interest levied/ leviable on BHEL, as the case may be.
37.14	Successful bidder shall upload the invoices raised on BHEL in GSTR-1 within the prescribed time as given in the GST Act. Bidder shall note that in case of delay in declaring such invoice in your return and GST credit availed by BHEL is denied or reversed subsequently as per GST Law, GST amount paid by BHEL towards such ITC reversal as per GST law shall be recoverable from the successful bidder along with interest levied / leviable on BHEL.
37.15	Way Bill: Successful bidder to arrange for way bill / e-waybill for any transfer of goods for the execution of the contract. Successful bidder has to make their own arrangement at their cost for completing the formalities, if required, with Issuing Authorities, for bringing materials, plants & machinery at site for execution of the works under this contract, Road Permit / Way Bill, if required, shall be arranged by successful bidder and BHEL will not supply any Road Permit/ Way Bill for this purpose.
37.16	Any new taxes & duties, if imposed subsequent to due date of offer submission as per NIT & TCN, by statutory authority during contract period (including extension, if the same is not attributable to you), shall be reimbursed by BHEL on production of relevant supporting document to the satisfaction of BHEL. However, you shall obtain prior approval from BHEL before depositing new taxes and duties.
37.17	Benefits and / or abolition of existing taxes must be passed on to BHEL against new taxes, if any, proposed to be introduced at a later date.
38.0	**PRICE VARIATION COMPENSATION (PVC)**

38.1	Applicable as per the relevant clause of GCC.
39.0	**OVER RUN COMPENSATION (ORC)**
39.1	ORC shall be applicable as per relevant provision of GCC
40.0	**TERMS OF PAYMENT**
40.1	The tenderer shall quote separate rates as required therein for each of the categories of work in the rate schedule.
40.2	The contractor shall submit his running bill once in a month at the end of each month. The R.A. bill complete in all respects accompanied by BHEL engineers certified/measurement sheet, jointly signed and EPF compliance certificate from EPF authority, will be paid after 45 days of submission of the bill. The measurement will be taken as specified in terms and conditions of contract and certified by the BHEL engineer of actual work. However no extra payment shall be made in the event of delay in release of payment.
40.3	Out of above progressive payment, 5% will be retained from each RA bill which will be released on completion of guarantee period . However, this 5% payment can be released against submission of performance bank guarantee valid for the completion of guarantee period in prescribed proforma subject to receipt of certificate that all works are completed in all respects and completion of final bill formalities including receipt of all TCS certificates from vendor,if applicable.The submission of bank guarantee towards performance guarantee is separate and the bank guarantee towards security deposit cannot be utilised for this purpose. The security deposit will be refunded as per GCC.
40.4	Subject to any deduction which BHEL may be authorised to make under the contract, the contractor shall on the certification of the BHEL engineer at site, be entitled to receive payment as explained hereunder.
40.5	Billing schedule will be as per **Annexure–I** of the tender document. However, further micro break up (if required) for the above schedule can be done by BHEL site after awarding of the job to vendor by mutual agreement.
40.6	Out of above stated R/A bill payment 1.5 % shall be released for payment against each RA bill in the following manner on certification by BHEL engineer after compliance of each of following activity in each month. In case of non-fulfilment of respective activity by vendor in each month, no payment shall be made by BHEL against corresponding activity and no claim of bidder at a later date, whatsoever, in this regard shall be entertained by BHEL.
40.7	0.7 % shall be paid on compliance of housekeeping of vendor's working area and store/ office areas.
40.8	0.3 % shall be paid on compliance of general illumination of vendor's working area and stores, office area.
40.9	0.2 % shall be paid on compliance of applicable OHSAS requirement as per guidelines of BHEL/ PSER and as specified in the tender.
40.10	0.3 % shall be paid on compliance of applicable Safety requirement as per guidelines of BHEL/ PSER and as specified in the tender.
40.11	All admissible recovered/ adjustments etc shall be made from the interim payable amount.
40.12	Contractor shall make his own arrangement for making payment of impending labour wages and other dues in the meanwhile.
40.13	Applicable component of GST, which shall be claimed with each RA bill, shall be released to the successful bidder upon compliance of following:
40.13.1	Vendor declaring such Invoice in his GSTR-1
40.13.2	Receipt of Goods/ services and Tax Invoice by BHEL
40.13.3	Confirmation of payment of GST thereon by you on GSTN Portal
40.13.4	Above is subject to receipt of goods/ service and tax invoice thereof along with vendor declaring invoice in their return and paying GST within timeline prescribed for availing ITC by BHEL.
40.14	Vendor has to comply the BOCW norms as per details of activities noted vide relevant Annexure of this Tender.
40.15	It is to be strictly followed that monthly payment to all the workmen shall be made within 07th day of each months.

41.0	**EXTRA/ ADDITIONAL ITEMS OF WORK**	
41.1	Extra work shall be applicable as per GCC except for the high pressure joints covered under following:	
41.2	EXTRA WORK RATE FOR HIGH PRESSURE JOINTS	
41.2.1	The following are all inclusive rates and will be applicable for rectification/ modification/ re-work involving welding of high pressure joints.	
	Unit rate per equivalent joint of size OD 63.5 mm x 6.3 mm thick.	
	Type of material	Average unit rate per equivalent joint
41.2.1.1	Carbon steel.	Rs 200.00
41.2.1.2	Alloy steel.	Rs 250.00
41.2.2	The unit rates for welding are all inclusive including joint preparation, scaffolding, edge preparation, cutting, welding, radiography with films, stress relieving etc with all consumables and tools and plants.	
41.2.3	The rates indicated are firm and are not subject to any escalation during the contract period till the completion of work.	
41.2.4	For additional radiography, if so desired by BHEL payment @ Rs.6.00 per cm length of film (100 mm wide) exposed and accepted by site engineer and further certified by site Engineer that the length of the exposed is minimum required for carrying out the radiography shall be paid.	
41.3	No PVC, rate revision, over run charge/ compensation is applicable for extra works.	
41.4	Bills against Extra work covered under clause 41.1 & 41.2 can be raised only on completion of work.	
41.5	In the event of any dispute regarding acceptance of any work as “EXTRA", the work has to be carried out by keeping man-hour and consumables record jointly signed with remark "for EHQ decision". Under no circumstances, the bidder can refuse to carry out such work with pre-condition, save and except of keeping daily record of category of man-hours and consumables spent for the particular job for further consideration by EHQ at Kolkata.	
42.0	**GUARANTEE PERIOD**	
42.1	Even though the work will be carried under supervision of BHEL engineers, bidder will be responsible for the quality of the workmanship and shall guarantee the work done for a period of 18 months from the date of start of guarantee period of the unit, as certified by BHEL site authority for good workmanship and shall rectify free of cost all defects due to faulty erection. In case bidder fails to repair the defective works within the time specified by engineer, BHEL may proceed to undertake the repairs of such defective works at contractor's risk and cost without prejudice to any other rights and recover the same from SD/ other dues.	
42.2	The guarantee period will commence from the date of handing over of the unit to customer or six months after Completion of Facilities of the unit, whichever is earlier, provided, all erection, testing and commissioning works are completed in all respect for the unit.	
43.0	**LIQUIDATED DAMAGES (LD)**	
43.1	**INTERMEDIATE MILESTONE**	
43.1.1	Liquidated damage shall be imposed for non achievement of Milestones as mentioned in Clause 22.5.2, 22.5.4 & 22.5.5 above. Applicable rate for LD deduction will be 0.10% per week of Contract Value, limited to maximum 2% of executable contract value plus applicable GST which will be withheld till completion of job and decision of deductible LD amount.	
43.1.2	Also for non-achievement of further Milestones as mentioned in Clause 22.5.8, 22.5.9 & 22.5.12 above similar intermediate Milestone LD will be imposed at the rate of 0.10% per week of Contract Value, limited to maximum 3% of executable contract value plus applicable GST. This amount shall also be withheld till completion of job and decision of deductible LD amount.	
43.1.3	Amount already withheld, if any against slippage of milestones mentioned in clause 22.5.2, 22.5.4, 22.5.5, 22.5.8, 22.5.9 & 22.5.12 above, shall be released only if there is no delay attributable to contractor in achievement of Milestone as mentioned in clause 22.5.14.	

43.1.4	Amount to be withheld on account of slippage of identified intermediate milestone(s) shall be withheld from the immediate next RA bills of scheduled milestone dates, in case milestone dates could not be achieved by the agency, and it is to be withheld @10% of RA Bill amount until the specified limit of LD amount is reached.
43.1.5	In case of termination of contract due to any reason attributable to contractor before completion of work, the amount already withheld against slippage of intermediate milestones shall not be released and be converted into recovery.
43.2	Overall Completion
43.2.1	In the event of any delay attributable to the contractor towards completion of job as per contract and handing over of facilities with acceptable standards/quality within the period as stipulated in the contract or any extension thereof, the contractor shall be liable to pay Liquidated damage (LD) to BHEL for the delay at the rate of 0.25% of the contract price per week plus applicable GST. This Liquidated Damage (LD) on account of delay in the completion schedule (38 months) and short fall of performance shall be limited to cumulative capping of 10% of contract price plus applicable GST.
43.3	In all, bidder's liabilities on account of LD (for non-completion of overall scope of works and non-achievement of intermediate milestones) shall be restricted to 15% of executable contract price plus applicable GST.
43.4	LD withheld amount shall be paid to the contractor if the overall completion schedule is achieved as per the contractual time period.
43.5	In case of LD recovery, the applicable GST shall also be recovered from the contractor.
43.6	All other terms shall be as per the provision of GCC.
Note:	Executable Contract Value – Value of work for which inputs/ fronts were made available to contractor and were scheduled for execution till the date of achievement of the Milestone.
44.0	**INTEREST BEARING RECOVERABLE ADVANCE / MOBILISATION ADVANCE**
44.1	Interest bearing recoverable advance / Mobilisation advance is not applicable.
45.0	**PAYING AUTHORITY**
	Construction Manager BHEL site office 1X660 MW, Sagardighi Thermal Power Project, Phase-III, Extension Unit#5, Sagardighi, Murshidabad, West Bengal
46.0	**QUANTITY VARIATION**
46.1	The quantities of the various items mentioned in the respective Price schedules, Volume-III are approximate, based on very preliminary information and may vary to any extent or to be deleted altogether. The quoted rates of each item will remain firm throughout the period of execution including extension, for reasons whatsoever, as long as variation in the total value of the work executed under any part of this contract including extra items, if any, but excluding any price variation, remains within +/- 15 % (plus/minus fifteen percent) of the awarded price (as per LOI / WO).
46.2	The unit rate quoted for various items of BOQ shall include all the stipulation mentioned in the tender documents and nothing extra over BOQ rates shall be payable.
46.3	However, the contractor shall inform BHEL in case quantity variation of any item crosses + 50% (plus fifty percent) limit during execution and obtain consent of CM, BHEL for execution of further quantity for this item.
47.0	**OTHER TERMS**
47.1	While bidder's scope include deployment of all resources, like T&P, materials, consumables, manpower including supervision etc for proper completion of the job and no sub-contracting for execution of the job is allowed by BHEL, depending on project's requirement and on prior acceptance of BHEL/ customer, bidder may associate agencies for deployment of skilled/ un-skilled manpower only for site execution. Bidder should arrange all resources, like T&P, materials, consumables, supervision etc directly for the subject job.
47.2	All other term & conditions of this specification shall be governed by the pertinent provisions of GCC.

APPENDIX-I

APPROXIMATE WEIGHT SCHEDULE OF MAJOR PACKAGES FOR 1X660 MW SAGARDIGHI PROJECT

Pressure parts (Group-I)

SL NO	PG Group	PGMA DISCRIPTION	APPROX. WEIGHT (IN MT)
1	04	Separator & collector Vessels	94
2	05	Furnace Water Wall Header	131
3	06	Furnace Water Wall Panels	1,100
4	07	Furnace risers, Screen Tubes, Mixing Spheres, Spiral Wall	380
5	08	Buck Stays	1,570
6	09	Seal Box and other tapings	20
7	10	Super Heater Headers	339
8	11	Super Heater Coils	1,485
9	12	SH Spacer Tubes, Sat. Links, Desh & desh Links, SH hangers & supports	570
10	15	Reheater Header	117
11	16	Reheater Coils etc	1,275
12	17	Reheater Links & suspensions	330
13	18	Furnace roof Skin Casing	20
14	19	Economiser Coils, Headers & pipes	2,193
15	20	Soot Blowing System	110
Total (in MT)			**9,734**

Trim Piping (Group-II)

SL NO	PG Group	PGMA DISCRIPTION	APPROX. WEIGHT (IN MT)
1	21	Soot Blower Piping	33
2	24	Boiler Trim Piping, Safety Valves, Silencers, Name Plates, Etc	619
Total (in MT)			**652**

Non- Pressure parts (Group-III)

SL NO	PG Group	PGMA DISCRIPTION	APPROX. WEIGHT (IN MT)
		BOILER & AUXILIARIES	
1	28	Furnace doors & fasteners	18
2	30	Main Boiler Encl.	362
3	34	Bunker Bay Structures	2,042
4	35	Main Boiler Structures	8,271
5	36	Boiler main Floors, Stairs, Ladder, etc	5,974
6	37	Boiler outer Casing	94
7	38	Interconnecting structures & platforms	1149
8	39	Columns & frames for ducting, fan handling structures, etc.	1667
9	41	Oil & Gas Burner, Ignitors etc	3
10	42#	Oil System Piping's	95
11	43	Ignitor, Scanner & Seal Air System	114
12	45	Coal Burners Auxiliaries	326
13	47	Pulverized Fuel Piping & Supports	510
14	48	Air ducts, Flue Gas Ducts, Dampers, Expansion joints/ MEJS, Duct Supports etc.	4,009
15	57	Gates , Dampers & Blowers	1299
16	65	Coal Feeder Assembly	64
17	67	Coal Gates Assembly	104
18	97	Gauges , Switches, Flow meters, MTM pads,MTM Clamps etc.	23
20	99	Misc. Handling Equipment	60
21		Mill Handling Hoist	80
22		Ceramic Bend	250
23		Steam Blowing Piping	125
24		Acid Cleaning Piping	150
25		H & S for Acid Cleaning Piping	18
26		H & S for Temporary Piping	16
27	PEM	PHEs-SG	24
28	PEM	DMCW-SG PUMPS (HORIZONTAL)	12
Total (in MT)			**26859**

Rotating Machines (Group-IV)

SL NO	PGMA	PGMA DISCRIPTION	APPROX. WEIGHT (IN MT)
1.	50	STEAM COIL A P H	18
2.	52	Rotary Regenerative Air heater	1890
3.	55 & 56	FD, ID &PA Fans and accessories	382
4.	61	Mill System	936
5		ID Fan Motors	80
6		FD Fan Motors	28
7		PA Fan Motors	30
8		Mill Motors	64
Total (in MT)			**3428**

P-91 Piping (Group-V)

SL NO	PGMA	PGMA DISCRIPTION	APPROX. WEIGHT (IN MT)
1	80300	MS FROM SUPERHEATER TO BOILER STOP VALVE	159.6
2	80301	MS FROM BOILER STOP VALVE TO ESV	399
3	80303	MS HEADER TO AUX PRDS	7.8
4	80304	MS HEADER TO HPBP VALVE	28
5	80310	HRH FROM REHEATER TO INTERCEPTOR VALVE	288.5
6	80312	LPBP VALVE UPSTREAM	35
7	80913	VALVES	50
8	22101	VALVES	5.2
Total (in MT)			**973.1**
			SAY 973

Alloy Steel Piping (Group-VI)

SL NO	PGMA	PGMA DISCRIPTION	APPROX. WEIGHT (IN MT)
1	80320	CRH FROM TURBINE TO REHEATER	50
2	80321	HPBP VALVE TO CRH PIPING	8
3	80451	BOILER INTEGRAL PIPING DRAINS	25
4	80312	LPBP VALVE DOWNSTREAM	55
5	80452	HP PIPING DRAINS - SG SCOPE	50
6	80913	VALVES	25
7	80914	VALVES	1
8	80918	VALVES	2
Sub Total (in MT)			**216**

Carbon Steel Piping (Group-VII)

SL NO	PGMA	PGMA DISCRIPTION	APPROX. WEIGHT (IN MT)
1	80320	CRH FROM TURBINE TO REHEATER	166
2	80332	EXTRACTION STEAM TO LP HEATER-3	14
3	80334	EXTRACTION STEAM TO LP HEATER-5	10
4	80342	AUX STEAM TO SCAPH	11
5	80343	AUX STEAM TO AH SOOT BLOWERS	4
6	80345	AUX STEAM TO DEAERATING HEATER	6
7	80351	AUX STEAM TO UNLISTED USERS - SG SCOPE	26
8	80373	AUX STEAM HEADER SV EXHAUST	7
9	80375	UNLISTED SV EXHAUSTS - TG SCOPE	5
10	80421	BOILER FEED PUMP RECIRCULATION	13
11	80423	BOILER FEED PUMP TO HPH INCLUDING BYPASS	133
12	80424	BFD BETWEEN HTRS & GROUP PROTECTION VLV	70
13	80425	BFD FROM FINAL HPH TO SG TP	92
14	80430	SPRAY WATER TO HPBP	4
15	80433	SPRAY WATER FROM BFP INTERSTAGE	14
16	80453	LP PIPING DRAINS - SG SCOPE	9
17	80454	SCAPH DRAINS	2
18	80455	DRAIN FROM UNLISTED EQPT/VESSEL-SG SCOPE	21
19	80460	SG AUX COOLING WATER UNIT SYSTEM	49
20	80471	BOILER WATER WASH TO & FROM UNIT	20
21	80901	SUB DELIVERY VALVES FOR LIGHT UP	10
22	80920	H&S FOR HYDRO TEST	24
23	80921	H&S FOR LIGHT UP STEAM LINE	63
24	80928	H&S FOR BOILER LIGHT UP - TG	38
25	80930	H&S FOR SYNCHRONISATION - TG	144
26	80940	AUX STRUCTURE FOR CRITICAL PIPING-SG	150
	80905	VALVES	20
27	80913	VALVES	175
28	80914	VALVES	3
29	80918	VALVES	9
30	80992	IMPORTED ELECTRODES	16
31	80340	AUX STEAM HEADER	3
32	80322	CRH PIPING TO DEAERATING HEATER	8
33	80324	CRH HEADER TO AUX.PRDS	1
34	80335	EXTRACTION STEAM TO DEAERATING HEATER	12
35	80336	EXTRACTION STEAM TO HP HEATER NO.1	8
36	80337	EXTRACTION STEAM TO HP HEATER-2	5
37	80338	EXTRACTION STEAM TO HP HEATER-3	7
38	80341	AUX STEAM HEADER INTERCONN BETWEEN UNITS	40
39	80323	STEAM TO BFP DRIVE TURBINE	8
40	80329	EXTRACTION STEAM TO BFP DRIVE TURBINE	12
41	80339	AUX STEAM TO BFD TURBINE	3
42	80349	AUX STEAM TO GLAND SEALS	1
43	80370	HP DRAIN FLASH TANK VENT TO ATMOSPHERE	60
44	80480	FIRE WATER-OTHER AREAS	29
45	80545	LP CONDENSATE PIPING WITHIN TG HALL FOR	18
46	80830	H&S FOR CRITICAL PIPING - STEAM LINES	190

46	81100	CONDENSATE PUMP	5
47	81110	COOLING WATER PUMP	.5
48	81036	CW STORAGE TANK 16-25 CUM	7.5
49	81060	SPECIAL TANKS AND VESSELS	50
50	PEM	STEAM TRAP	0.24
Total (in MT)			**1800.7**
			SAY 1801

ESP (Group-VIII)

SL NO	PG Group	PGMA DISCRIPTION	APPROX. WEIGHT (IN MT)
1	79180	FOUNDATION MATLS FOR ESP	39.42846
2	79181	SUPPOTING STRUCTURES FOR ESP	1550
3	79101	ROLL/SLIDE SUPPORTS	54.8
4	79148	CASING STRUCTURE	830
5	79143	HOPPER RIDGES	125
6	79149	CASING SHELL/PANEL	1263
7	89610	EP GALLERIES&STAIRS	130
8	89612	FLOOR GRILL AND STEP TREAD	81
9	79128	ESP ROOF BEAM	360
10	79119	COL ELEC SUSPENSION	212.2
11	79113	EMIT SYST SUSPENSION	33
12	79146	INSULATOR SUPP PANEL	235.5
13	79121	EMIT SYS FRAME-TOP	192
14	79132	EMIT SYS FRAME-MIDLE	460
15	79122	EMIT SYS FRAME BOTOM	244
16	79114	SUPPORT INSULATORS	32.5
17	79120	COLLECTING ELECTRODE	2207
18	79108	GAS DIST. ASSY	94.5
19	79147	ROOF PANEL ASSY	325
20	79150	INLET-OUTLET FUNNEL	300.6
21	79157	SPLITTER&GUIDE VANES	38
22	79189	GUIDE PLATE/VANE EP INLET DUCT	15
23	79124	SHOCK BARS	163.4
24	79125	COLL ELECT RAPP MECH	129
25	79111	GAS SCREEN-EP	8
26	79115	EMITTING ELECTRODES	52
27	79142	OUTER ROOF-EP	426
28	79144	HOPPER UPPER PART	600
29	79145	HOP MLD&LOWER PART	900
30	79165	APP PLATFORM-HOPPER	200
31	89613	FLOOR GRILL AND MOBILE LADDER	70
32	79116	EMIT ELECT RAPP MECH	79.5
33	79117	DRIVE ARGT. FOR EMIT. SYS	62.8
34	79106	INSULATOR HOUSING AS	100.7
35	79155	PENT HOUSE FOR E P	255
36	89614	PENT HOUSE ROOFING SHEETS	66
37	89611	ESP ROOF HANDRAILS	16
38	79126	COLL ELEC RAPP DRIVE	14.4
39	79109	GD-RAPPING MECHANISM	17
40	79110	GD_DRIVE ARRANGEMENT	1.3
41	79123	INSPECTION DOORS	36.6
42	79159	SUPPORTS FOR ELECTRICAL ITEMS	27
43	79131	GEARED MOTORS FOR RAPPING MECH	33.5
44	79105	ESP-SUB-DELIVERY COMPONENTS	1.1
45	79190	HEATING ELEMENTS	1.7
46	89615	INSULATION CLADDING SH FOR ESP	220

47	79191	PANEL TYPE HOPPER HEATERS & AC	35
48	79130	ELECTRICAL SD COMPTS	37
49	79137	JUNCTION BOX & PUSH BUTTON STA	2
50	79168	FIXING COMP. FOR ESP INSULATIN	121
51	79166	WATER WASHING SYSTEM	6
52	79167	MIN WOOL FOR ESP INSULATION	453
53	79172	INTERLOCKS-EP	3.8
54	79173	ELECTRICALLY OPERTD HOIST&ACCE	11
55	79163	ASH LEVEL INDICATOR	4.5
56	79161	EP PERF TEST EQUIPT	26
57	79164	MISCELLANEOUS ITEMS	5
58	79988	COMMISSIONING SPARES	1
59	79996	TOOLS & TACKLES	0.4
60	JHANSI	HVR Transformer	240
			13249.2
Total (in MT)			**SAY 13249**

FGD System (Group-IX)

SL NO	PG Group	PGMA DISCRIPTION	APPROX. WEIGHT (IN MT)
1	FW280	FOUNDATION MATL FOR DUCT STRUC	17
2	FW219	ABSORBER SYSTEM-BASE	20
3	FW784	HSFG BOLTS	5
4	FW283	FOUNDATION MATL RC PUMP SHED	5
5	FW282	FOUNDATION MATL FOR ELEVATOR	5
6	FW285	SUPRTING STR FOR EMERGENCY QWT	10
7	FW226	EMERGENCY QUENCH WATER TANK	20
8	FW231	ABSORBER SHEAR PLATE	10
9	FW372	HSFG BOLT-ELEV STRUC	5
10	FW382	ELEVATOR FLOORS	5
11	FW383	ELEVATOR STAIR AND HAND RAIL	5
12	FW384	ELEVATOR FLOOR GRILL	5
13	FW385	ELEVATOR M/C ROOM & GUIDE ,	10
14	FW380	ELEVAIOR,COLURNN'	20
15	FW381	ELEVATOR BEAM AND BRACING	50
16	FW371	HSFG BOLT-RC SHED	5
17	FW236	STRUCTURES FOR RC PUMP HOUSE	110
18	FW721	AGITATOR SUPPORT	20
19	FW251	EXPNSN JNT METALLIC	13
20	FW281	FOUNDATION MATL FOR ABS	10
21	FW298	PLATFORM FOR G&D	5
22	FW297	PLATFORM FOR DUCT	5
23	FW255	DUCT BYP & BUF/GGH/ABS	298
24	FW232	DUCT SUP BYP & BUF/GGH	46
25	FW207	OUTLET GUIDE VANE	10
26	FW612	GALLARIES AND RAILINGS FOR DAM	10
27	FW613	GALLARIES AND RAILINGS FOR DUC	10
28	FW257	DUCT ABS & BYP/STACK	121
29	FW234	DUCT SUP ABS & STACK/BYP	19
30	FW373	HSFG BOLT-DUCT STRU	5
31	FW260	DUCT STR BYP & BUF/GGH/ABS	142
32	FW262	DUCT STR ABS & BYP/STACK	152
33	FW229	W/D WASH SYSTEM	5
34	FW227	EMERGENCY QUENCH SYSTEM	12
35	FW781	START STOP PUSH BUTTON	0.1
36	FW775	JUNCTION BOX	1.17
37	FW228	ABSORBER-W/D INTERFACE	12
38	FW766	PLATFORM FOR PIPE RACK	30
39	FW720	AGITATORS	10
40	FW215	MIST ELIMINATOR & ACCESSORIES	35
41	FW789	TEMPLATE-MISC	5
42	FW798	AIR RECEIVERS	10
43	FW710	MONORAIL FOR HOIST & CRANES	20
44	FW225	ABSORBER SYSTEM-RUBBER LINING	10
45	FW213	ABSORBER SYSTEM INTERNALS	170
46	FW265	LINING OF DUCT	5

SL NO	PG Group	PGMA DISCRIPTION	APPROX. WEIGHT (IN MT)
47	FW253	EXPANSION JOINT BETWEEN SCRUBR	7
48	FW702	WATER PUMPS & ACCESSORIES	30
49	FW701	SLURRY PUMPS & ACCESSORIES	33
50	FW760	FOUNDATION MATL FOR PIPE RACKS	10
51	FW214	ABS BAFFLE GRATING	20
52	FW761	STRUCTURE FOR PIPERACKS	50
53	FW768	TRESTLE FOR MAIN PIPE RACK	300
54	FW991	SPECIAL WELDING ELECTRODE	1
55	FW201	ABSORB. RC PUMP NOZZLE	5
56	FW202	ABS NOZL NB 300 & ABOVE	5
57	FW203	NOZZLE NB25 TO NB250	5
58	FW209	MAN HOLE DOOR FOR ABSORBER	5
59	FW711	SHIM PLATE FOR PIPE RACK	5
60	FW386	INTER-CONNECTING PLTF TO ABS	10
61	FW815	RC PUMP INLT & OUTLT VALVE	10
62	FW779	SUPPORTS FOR CABLE TRAYS/CONTR	10.06
63	FW216	ABS BAFFLE GRATING SUPP	20
64	FW217	ABS ME SUPPORT	20
65	FW218	ABS SPRAY PIPE SUPP	20
66	FW793	PIPE SUPPORT	20
67	FW758	VALVES AND FITTINGS COMMON	23
68	FW221	ABSORBER SYSTEM-CASING BOTTOM	100
69	FW322	ABSORBER SYSTEM-CASING INTERM	100
70	FW222	ABSORBER SYSTEM-CASING TOP	120
71	FW267	INSULATION MATERIALS FOR DUCT	21
72	FW269	CLADDING SHEET FOR DUCT	21
73	FW268	FIXING COMP FOR DUCT	41
74	FW239	VIEWING PORTS	1
75	FW306	ABSORBER HSFG FASTNERS	5
76	FW709	TRENCH COVER PLATE	5
77	FW302	ABSORBER LOWER FLOORS	10
78	FW303	ABSORBER UPPER FLOORS	10
79	FW307	ABSORBER MISCELLANEOUS	10
80	FW305	ABSORBER STAIRS & HANDRAILS	20
81	FW304	ABSORBER FLOOR GRILLS	30
82	FW223	ABSORBER SYSTEM ACCESSORIES	55
83	FW300	ABSORBER COLUMNS	70
84	FW301	ABSORBER BEAMS AND BRACINGS	200
85	FW718	ROOF SHEETING	5
86	FW717	MAN HOLE DOOR	5
87	FW751	PROCESS WATER PIPE ACCESSORIES	10
88	FW752	COOLING WATER PIPE ACCESSORIES	10
89	FW754	SERVICE AIR PIPE ACCESSORIES	10
90	FW755	INSTRUMENT AIR PIPE ACCESSORIE	10
91	FW244	OXIDATION AIR DISTRIBUTION SYS	20
92	FW715	HANDLING EQUIPMENT IN FGD	30
93	FW753	SLURRY PIPE ACCESSORIES	40
94	FW790	TOOLS	10

SL NO	PG Group	PGMA DISCRIPTION	APPROX. WEIGHT (IN MT)
95	FW988	COMMISSIONING SPARES	10
96	57583	DAMPER FGD BYPASS	62.6
97	57497	KNIFE GATE VALVE	9
98	57566	PLATFORMS AND LADDERS-FGD GD	50
99	57580	GATE-FGD BYPASS	76.4
100	57141	SEAL AIR HAG AND ID FAN OUTGAT	24
101	57560	GATE-FGD INLET	52
102	57570	GATE-FGD OUTLET	52.5
103	57491	BLOWER WITH MOTOR	13
104	57578	ELECTRICAL ITEMS FOR GATE,DAMP	0.028
105	57577	ELECT ACTUATOR FOR GATE,DAMPER	6.6
106	FW996	TOOLS & TACKLES	10
Total (in MT)			**3442.5**
			SAY 3443

SCR System (Group-X)

SL NO	PG Group	PGMA DESCRIPTION	APPROX. WEIGHT (IN MT)
1	SC-104	DENOX - FIELD INTERCONNECTING EQPTS	130
2	SC-112	DENOX - PNEUMATIC ACTUATOR IN A&FG SYS.	0.3
3	SC-116	DENOX - PNEU TUBINGS FITTINGS & AIR SET	0.3
4	SC-300	DENOX - FIELD GAUGES	0.7
5	SC-308	DENOX - FIELD TRANSMITERS & TEMP. ELMNTS	0.7
6	SC-312	DENOX - FLOW MEASURING DEVICES	0.8
7	SC-316	DENOX -ANALYSERS	0.8
8	SC-324	DENOX - ERECTION MATERIALS	15
9	SD-342	SCR Inlet Ducting	280
10	SD-344	EXPJNT-SCR inlet ducting	16
11	SD-345	Supports-SCR Inlet ducting	22
12	SD-352	SCR outlet ducting	195
13	SD-354	EXPJNT-SCR outlet ducting	17
14	SD-355	Supports-SCR outlet ducting	22
15	SD-362	Eco bypass ducting	110
16	SD-364	EXPJNT-Eco bypass ducting	17
17	SD-365	Support-Eco bypass ducting	22
18	SR-010	ANHYDROUS AMMONIA TRUCK UNLOADING SKID	3
19	SR-020	ANHYDROUS AMMONIA FORWARDING PUMP SKID	3
20	SR-050	WASTE AMMONIA DILUTION TANK	3
21	SR-100	ANHYDROUS AMMONIA STORAGE TANK	150
22	SR-103	AMMONIA STORAGE AREA - BHEL VALVES	1
23	SR-106	AMMONIA STORAGE AREA - BOI VALVES	2
24	SR-121	AMMONIA STORAGE AREA- PIPING SUPTS	3
25	SR-122	AMMONIA STORAGE AREA - DD ITEMS	2
26	SR-128	AMMONIA STORAGE AREA - SHOP ITEMS	2
27	SR-150	WASTE AMMONIA HANDLING SYSTEM - SD	1.5
28	SR-151	WASTE AMMONIA HANDLING SYS-PIPING SUPT	4
29	SR-152	WASTE AMMONIA HANDLING SYSTEM- DD ITEMS	1.5
30	SR-158	WASTE AMMONIA HANDLING SYSTEM -SHOP	1.5
31	SR-171	WATER SPRINKLER SYSTEM-PIPING SUPTS	2
32	SR-172	WATER SPRINKLER SYSTEM - DD ITEMS	0.4
33	SR-178	WATER SPRINKLER SYSTEM - SHOP ITEMS	4
34	SR-180	AMMONIA STORAGE AREA-SAFETY EQUIP. SD	0.5
35	SR-181	AMMONIA FARM UTILITY PIPING SUPTS, MISC	1.6
36	SR-182	AMMONIA FARM UTILITY - DDITEMS	0.2
37	SR-188	AMMONIA FARM UTILITY - SHOP ITEMS	0.8
38	SR-200	AMMONIA SYSTEM SCR AREA - SUB DELIVERY	0.5
39	SR-203	AMMONIA SYSTEM SCR AREA - BHEL VALVES	0.5
40	SR-206	AMMONIA SYSTEM SCR AREA - BOI VALVES	0.5
41	SR-207	AMMONIA SYSTEM-FASTENERS	0.5
42	SR-251	AMMONIA SYSTEM SCR AREA-PIPING SUPT,MISC	0.5
43	SR-252	AMMONIA SYSTEM SCR AREA - DD ITEMS	0.2
44	SR-258	AMMONIA SYSTEM SCR AREA - SHOP ITEMS	1.5
45	SR-270	AMMONIA INJECTION SKID	1.3
46	SR-281	AMMONIA SCR UTILITY PIPING SUPTS, MISC	0.5
47	SR-282	AMMONIA SCR AREA UTILITY - DD ITEMS	0.5
48	SR-288	AMMONIA SCR AREA UTILITY - SHOP ITEMS	1
49	SR-300	DILUTION AIR SUPPLY SYSTEM - SD	2.5
50	SR-301	DILUTION AIR SUPPLY SYSTEM - PIPING SUPT	8
51	SR-303	DILUTION AIR SUPPLY SYSTEM - BHEL VALVES	1.5
52	SR-306	DILUTION AIR SUPPLY SYSTEM - BOI VALVES	1
53	SR-307	DILUTION AIR SUPPLY SYSTEM - FASTENERS	1
54	SR-308	DILUTION AIR SUPPLY SYSTEM - SHOP ITEMS	35
55	SR-330	DILUTION AIR HEATER -ELECTRIC	5

SL NO	PG Group	PGMA DISCRIPTION	APPROX. WEIGHT (IN MT)
56	SR-400	SCR - RECTIFIER	48
57	SR-490	SCR-REACTOR SEALING SYSTEM	5
58	SR-500	CATALYST DE- DUSTING SYSTEM	15
59	SR-503	Catalyst De- Dusting system- BHEL Valves	0.5
60	SR-506	Catalyst De- Dusting system- BOI Valves	0.5
61	SR-507	Catalyst De- Dusting system- Fasteners	0.2
62	SR-511	CATALYST DE-DUSTING SYS. PIPING SUPRT	0.5
63	SR-512	CATALYST DE-DUSTING SYSTEM PIPING - DD	0.5
64	SR-518	CATALYST DE-DUSTING SYSTEM PIPING - SHOP	1
65	SR-992	AMMONIA SYSTEM-WELDING ELECTRODES	0.2
66	SS-110	SCR Supporting Post	130
67	SS-111	SCR Supporting Post	70
68	SS-210	SCR SUPPORTING GIRDER	175
69	SS-361	SCR FLOOR 1	80
70	SS-362	SCR FLOOR 2	80
71	SS-363	SCR FLOOR 3	80
72	SS-364	SCR FLOOR 4	80
73	SS-391	MISCELLANEOUS PLATFORMS-PART I	20
74	SS-392	MISCELLANEOUS PLATFORMS-PART II	20
75	SS-393	MISCELLANEOUS PLATFORMS-PART III	20
76	SS-394	HANDLING STRUCTURE - PART 1	25
77	SS-395	HANDLING STRUCTURE - PART 2	25
78	SS-396	HANDLING STRUCTURE - PART 3	25
79	SS-440	SCR Post Connecting Beams	150
80	SS-550	SCR VERTICAL BRACINGS	153
81	SS-700	SCR HSFG FASTENERS	5
82	SS-701	SCR Fasteners	2
83	SS-810	SCR FLOOR GRILL	30
84	SS-820	STAIRS & LADDERS	5
85	SS-850	HANDRAIL	15
86	SS-901	SCR Supporting Posts and Restraints	56.795
87	SS-906	SCR Rectifier Truss Arrangement	44.082
88	SS-907	SCR Cap Truss Arrangement	41.863
89	SS-908	SCR Bottom Hopper Truss Arrangement	19.979
90	SS-915	SCR Catalyst Front Casing Wall	28.544
91	SS-916	SCR Rectifier Front Casing Wall	6.47
92	SS-917	SCR Cap Top Casing Wall	14.101
93	SS-918	SCR BOTTOM HOPPER FRONT CASING WALL	30.042
94	SS-925	SCR Catalyst Rear Casing Wall	43.291
95	SS-926	SCR Rectifier Rear Casing Wall	10.023
96	SS-927	SCR Cap Rear Casing Wall	39.302
97	SS-928	SCR BOTTOM HOPPER REAR CASING WALL	37.061
98	SS-935	SCR Catalyst Left Casing Wall	51.295
99	SS-936	SCR Rectifier Left Casing Wall	9.497
100	SS-937	SCR Cap Left Casing Wall	14.781
101	SS-938	SCR BOTTOM HOPPER LEFT CASING WALL	18.501
102	SS-945	SCR Catalyst Right Casing Wall	51.295
103	SS-946	SCR Rectifier Right Casing Wall	9.488
104	SS-947	SCR Cap Right Casing Wall	14.852
105	SS-948	SCR BOTTOM HOPPER RIGHT CASING WALL	18.506
106	SS-955	SCR Catalyst Support Arrangement	133.509
107	SS-965	SCR Catalyst Support Hanger Strap	34.221
108	SS-975	SCR Catalyst Loading Door	25.929
109	SS-981	SCR PTFE Bearing Supp App.4 No's/SCR)	2
110	SS-982	SCR Floor Grills	45
111	SS-983	SCR Fasteners	3
112	SS-996	SCR Miscellaneous 1	20
113	SS-997	SCR Miscellaneous 2	30
114	SS-998	SCR Miscellaneous 3	30
115	SS-999	SCR Temporary Intern. Supp for Erection	36
Total (in MT)			**3278.9**

	SAY 3279

Insulation & Cladding (Group-XI)

BOILER & AUXILARY BOILER			
SL NO	**PG Group**	**PGMA DISCRIPTION**	**APPROX. WEIGHT (IN MT)**
1	31	Skin Casing & Components	4
2	32	Fixing components for insulation	400
3	33	Insulation wool	1,732
4	81	Mineral wool, cladding sheet , sealing compound	87
5	PEM	LRB Matress	530
6	PEM	ANC Material	35
7	PRM	Aluminium Sheet	95
Total (in MT)			**2883**

Note:
1. PGMA list provided is preliminary. The list is subjected to change progressively during detailed engineering activities.
2. Weights mentioned above are preliminary and are subjected to +/- 15% variation.
3. PGMA and Weight details provided are only for tendering purpose.

APPENDIX-II

LIST OF MAJOR CONSUMABLES TO BE PROVIDED BY CONTRACTOR

SL NO	DESCRIPTION OF ITEMS
01	Electrodes for CS , SS, AS – As required except for the special electrodes supplied by BHEL/Manufacturing Units
02	Different gases like O2, CO2, Nitrogen, Argon, D/A etc.
03	CTC, Petrol, diesel, kerosene – As required.
04	Lapping pastes
05	NDE Consumables
06.	Hoses and clamps of different sizes – As required
07	Touch –up paints, preservatives and other consumables.
08	Cotton wastes, jutes etc.
09	Primer and Finish Paint (To be sourced from BHEL/Customer approved Vendor)
10	Grouting cement as applicable
11	Wrapping-coating materials, tapes as per requirement.
12	Other consumables to complete the job (other than those quantities supplied by BHEL free of cost as per Appendix V)

NOTE

The above list is not exhaustive and all required the consumables required to complete the work shall have to be arranged by the successful contractor at his cost.

APPENDIX-III

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

A. TOOL & PLANTS

SL NO	DESCRIPTION OF EQUIPMENTS	MINIMUM CAPACITY	MINIMUM QUANTITY	REMARKS
1.	Crawler crane	250 T	01 no.	Crane to be made available at site after 45 days from date of LOI till the actual event of Coal Synchronization.
2.	Crawler crane	100 T	01 no.	Crane to be made available at site after 30 days from placement of LOI till the actual event of Coal Synchronization.
3.	Crawler cranes	75 T	02 nos.	1st Crane to be made available at site after 30 days from placement of LOI till the actual event of Coal Synchronization 2nd Crane to be made available at site after 90 days from placement of LOI till the actual event of Full load.
4.	Tyre mounted/Crawler cranes with telescopic boom/lattice boom	40 T	01 nos	Crane to be made available at site after 30 days from placement of LOI till the actual event of Coal Synchronization
5.	Pick & carry tyre mounted Front Cabin mobile crane (FX or TRX/ NextGen series of "ESCORT" or equivalent make)	10 T/12 T/14 T	08 nos	2 nos within 30 days of LOI, another 2 nos. within 45 days of LOI and balance progressively as per requirement.
6.	Trailer with prime mover	22MT	02 Nos.	Within 30 days of LOI
7.	Trailer with prime mover	40 MT	01 No.	Within 45 days of LOI
8.	Low bed trailer with min 70-100 feet span	60 MT	01 No.	Within 90 days of LOI
9.	DG SET	550 KVA	01 set	Within 45 days of LOI

				For continuous/ uninterrupted back up power during P-91 welding & post weld heat treatment of Girders and HP joints.
10	Tube expander	As required	As required	As required
11	Air compressor (electric/diesel operated)	210 CFM, 7 KG/CM2	01 nos.	Within 90 days of LOI
12	TIG welding set	As required	As required	Before pressure parts erection.
13	ARC WELDING M/C	As required	As required	
14	Oxy Acetelyne Gas cutting Machine	As required	As required	
15	DC arc welding machine	As required	As required	
16	3-phase distribution board with complete set up for drawl of construction power	As required	As required	
17	Power cable for drawl of construction power	As required	As required	
18	Self-drilling cum tapping machine for screws of boiler & ESP roof sheets	As required	As required	As per requirement
19	Electro-hydraulic pipe bending machine	Up to 2” nb and 12 mm thick pipes	As required	During Trim piping erection work.
20	Welding rectifiers (electrical)	300 ampere rating	As required	Since Boiler erection start
21	Welding generator (diesel operated)	300 ampere rating	As required	
22	Hydraulic pipe bending machine (manual)	For bending of pipes up to 50 mm nb size	As required	During Trim piping erection work.
23	Pipe chamfering machine /Tube Cutting	4-14”	As required	During pressure parts pre assembly & erection
24	Pipe chamfering machine /Tube Cutting	14-20”	As required	During pressure parts pre assembly & erection
25	Pipe cutting & bevelling machines	As required	Adequate nos.	During pressure parts pre assembly & erection
26	Chain pulley blocks of various & Suitable capacities	As required	As Required	Since Boiler erection start
27	Baking oven with thermostat and temperature gauge for welding electrodes	As required	As Required	Since Boiler erection start
28	Holding oven with thermostat and temperature gauge for welding electrodes	As required	As Required	Since Boiler erection start
29	Portable oven for welding electrodes	As required	As Required	Since Boiler erection start
30	Electric winch	10/15 ton capacity	As Required	6 nos. of 10MT & 4 nos. of 15MT winches along

				with ropes should be there at site within 90 days from start of work and balance 4 nos. of 10 MT & 2 nos. of 15MT winches along with sufficient ropes after CG erection as per requirement of site.
		2/3/5 ton capacity	As Required	As per site requirement
31	Hydraulic test / pressurizing pump/hand pump Upto 400 kg per cm2 along with accessories	As Required	As Required	For Piping and other areas Incl. installation, electrical connection, erection, testing and dismantling, temporary pipelines, fittings, etc. shall be carried out by the contractor as part of this work.
32	Filling pumps	As Required	As Required	For hydro/other tests of various systems
33	Furnace maintenance platform (sky climber) to cover one length and one width of furnace	Adequate capacity	2 nos.	120 days after start of work
34	Hand winch	0.5/1.0 ton capacity	As required	
35	Scaffolding materials with clamps suitable for working at various heights and for insulation purpose	As required	As required	2000 nos. of 3 meter & 6 meter pipes each along with 10000 clamps within 45 days from date of LOI. Balance 11000 nos. of 6 meter pipes and 6000 nos. of 3 meter pipes and 40000 clamps within 180 days from start of work.
36	Profile making m/c for aluminium sheet cladding work	As required	As required	
37	Nibbling m/c	As required	As required	
38	Shearing m/c	As required	As required	
39	Water pump to lift water to top of boiler for refractory other required activities	As required	1 set	
40	Portable grinding m/c	As required	As required	
41	Portable drilling m/c	As required	As required	
42	Hoisting and pulley devices/pulleys	Assorted capacities	As required	

43	Fire retardant tarpaulins	As required	As required	to protect the machined components / assembled parts drawn from BHEL before and after erection
44	Fire extinguisher	As required	As required	
45	Hydraulic jacks Gang Jack (Set of 4 Jacks)	100 T 50 T 200 T Others	04 nos 04 nos 1 set As per requirement	
46	Dewatering pumps with all accessories (Electrical & Diesel engine operated)	As required	As required	
47	Various sizes of clamps/ fixtures for assembling	As required	As required	
48	Spectrometer for metal testing	As required	As required	
49	U Tube Manometer 0-2000 mm Water Column	As required	As required	
50	Inclined Manometer 0-50 mm Water Column	As required	As required	
51	Special Slings for Erection of Ceiling Girders & other heavy components	As required	As required	
52	Concrete Blocks for making bed of steel structure for checking dimensional accuracy, configuration and minor rectification.	As required	As required	
53	Wooden sleeper for material storage at site.	As required	As required	
54	PORTABLE MAGNETIC STRUCTURE SCOPE Capacity/Specification.	As required	01 No	
55	Calibrated Power driven HSFG bolt tightening machines with set value facility.	AS required	As required	
56	Boroscope/video-scope with flash light (10 meter probe)	As required	As required	Within 90 days from start of work.
57	Pneumatic torque wrench & motorised torque wrench for of size 24mm & 30 mm	As required	As required	Before Start of Erection

NOTE

The above major T&P list is indicative only. Additional T & Ps, if required to complete the work, have to be mobilized by the contractor within the quoted/accepted rate.

B . MME List

SL	DESCRIPTION OF	MINIMUM CAPACITY/	MINIMUM	REMARKS

NO	EQUIPMENT	SPECIFICATIONS	QUANTITY	
1	Steel Scales	300mm,one meter, Least Count 0.5mm	As required	Before start of erection
2	Tapes	3, 15, 30, 50 meters	As required	Before start of erection
3	Theodolite (Digital)	1 Second accuracy	02 nos	Before start of erection
4	Resistance Heating Machine Set	As per BHEL "Guidelines for Selection of NDE & Heat Treatment Agencies" (PP-QLY-AA-DC-106/01-20)	As required	Before start of erection
5	Torque Wrench	600NM - 2500NM (LC10NM)	As required	Before start of erection
6	Bolt Tension Calibrator	90kN – 400kN	01 no.	Before start of erection
7	Torque Multiplier	1:5 ratio	As required	Before start of erection
8	Spirit Level	0.02mm/Meter, 150mm & 300mm	As required	Before start of erection
9	Feeler Gauges	0.03 to 10 mm range (150 & 300 mm lengths)	As required	Before start of erection
10	Vernier Calipers	0-150 mm,0-300 mm (least count 0.02)	As required	Before start of erection
11	Micrometers (Inside & Outside)	Inside:0-500mm,1000mm range, Outside:0-25,0-150,150-300 & 300-400 (Least count 0.01mm)	As required	Before start of erection
12	Dial Gauges	0.01mm least count, 0-10mm range, 40mm dia, minimum four numbers	As required	Before start of rotating machine erection.
13	Pressure Gauges	0-5,0-10,0-20,0-50,0-200,0-600 & 0-800 KG per CM square (L.C. : 0.5kg)	As required	Before start of erection

14	Bevel Protractor	0-180 Deg., least count 0.5Deg.	As required	Before start of erection
15	Thermometer (Digital)	0-200 Deg C., Least count 1Deg. Minimum	As required	Before start of erection
16	Digital Elcometer (Paint DFT tester)	Range up to 500 Microns	04 nos	Before start of erection
17	Thermometer Non contact type	0-200deg C., least count 1Deg. Minimum	As required	
18	Non-contact type tachometer	0-10000rpm, 0.1accuracy, 1rpm resolution	As required	Before start of rotating machine erection.
19	Vibration Meter (Velocity, Displacement, Acceleration)	Velocity : 0 – 100 mm/sec (rms) Disp. : 0-1500 µm (peak to peak) Acc. : 0-20g (0 to peak)	As required	Before start of rotating machine erection.
20	Megger	500 Volts,1 kV, 5kV (for HT motors)	As required	Before start of rotating machine erection.
21	Multimeter	3 ½ digit	As required	Before start of rotating machine erection.
22	Tong tester	0-1000 Amps(digital),1amp least count	As required	Before start of rotating machine erection.
23	Micro ohmmeter	Range - 2 ohms to 200ohms with an accuracy of +/- 0.5%	As required	Before start of rotating machine erection.
24	Ultrasonic Contact Impedance type Portable Hardness Tester of BHEL accepted make	Standardized according to ASTM A1038	As required	Before start of Pressure parts assembly / erection.
25	PMI Gun	Handheld XRF Analyzers (Digital)	As required	Before start of Pressure parts assembly / erection.
26	LPI Kit	BHEL approved make	As required	Before start of erection
27	UT machine	As per BHEL “Guidelines for Selection of NDE & Heat Treatment Agencies” (PP-QLY-AA-DC-106/01-20)		Before start of erection

28	RT Source	As per BHEL "Guidelines for Selection of NDE & Heat Treatment Agencies" (PP-QLY-AA-DC-106/01-20)		Before start of erection
29	Illuminators/Film viewers for RT films	Capable of variable light source sufficient for the essential IQI hole to be visible for the density range specified and obtained in the radiograph	As required	Before start of erection
30.	MPI Machine	As per BHEL "Guidelines for Selection of NDE & Heat Treatment Agencies" (PP-QLY-AA-DC-106/01-20)		Before start of erection
31	Handheld digital Gauss Meter	As per site requirement	As required	As and when required

Note: The above MME list is indicative only. Additional MMEs , if required to complete the work, have to be mobilized by the contractor within the quoted/accepted rate.

APPENDIX-IV

LIST OF T&P TO BE PROVIDED BY BHEL FREE OF HIRE CHARGES ON SHARING BASIS FOR ERECTION AND COMMISIOINING.

SL NO	DESCRIPTION & CAPACITY OF T&P	QTY	REMARKS
01	High capacity crane of 600MT or above capacity/ equivalent crane with/ without ringer	01 No	For limited period during the erection of structures like upper tiers of boilers, ceiling girders, roof top structures, Silencers etc. for which high capacity crane is required.
02	Mid-range crawler mounted crane (capacity 250 MT or equivalent)	01 No.	As per requirement during the execution period.
03	Mid-range crawler mounted crane (capacity 100 MT or equivalent)	01 No.	As per requirement during the execution period.
04	Goods cum Passenger Elevator for Boiler erection	01 No.	As per requirement
05	Induction Heating machine set **(Refer Appendix-VI for details)**	As reqd,	As per requirement
06	Hydraulic Test – Pressurizing Pump 0 – 1000 Kg/Sq.cm.	01 No.	As per requirement
07	Acid/ chemical cleaning pump: 200 TPH/equivalent with control panel	As reqd,	As per requirement
08	Acid/ chemical Transfer pump	As reqd,	As per requirement
09	Air leak test blower	As reqd,	As per requirement
10	Huck Bolting Machine	As reqd.	As per requirement

APPENDIX-V

LIST OF MAJOR CONSUMABLES TO BE PROVIDED BY BHEL (FREE OF CHARGES)

SL NO	DESCRIPTION OF ITEMS
01	All lubricants, chemicals as required for testing, chemical cleaning / acid cleaning, oil flushing and the lubricants for trial runs of the equipment and trial operation of the unit.
02.	TIG wires which will be supplied by BHEL units under regular supply.
03	Filler rods and electrodes for P91 piping system.
04	Any other special consumables as supplied by BHEL manufacturing units

APPENDIX-VI

A. FACILITY TO BE PROVIDED BY BHEL FOR P-91 WELDING, FREE OF CHARGES

1. Required No. of Induction Heating Machines with accessories.
2. Welding electrodes for P-91 welding.
3. Digital Temperature indicator.

The Induction heating equipment shall be drawn from BHEL stores, transported, installed and commissioned wherever required at site. For routine and breakdown maintenance, Contractor shall have to deploy sufficient Manpower, Tools & Plants within his quoted rate.

The contractor shall provide electrical cables and switches as required. All the equipment shall be protected by providing covers or sheds at site by the contractor within the quoted rate. Any loss / damage of equipment / tools by the contractor shall be recovered from the contractor.

B. FACILITY TO BE PROVIDED BY THE CONTRACTOR FOR P-91 WELDING

1. Required numbers of operators / technicians / electricians for installation, commissioning and operation continuously.
2. Gas burner arrangement with required gas for maintaining temperature in the event of power failure.
3. Ultrasonic flaw detector with recording Device & Complete accessories (Digital Type - Krautkramer model USN 50 or equivalent) capable of storing calibration data. All recordable indications will be stored in the memory of the digital flaw detector and in PC (to be arranged by contractor within his quoted rate) for review at a later period.
4. Spot welding Machine for fixing Thermo-couples.
5. EQUOTIP or MICRODUR make or equivalent portable hardness tester.
6. MPI & LPI kit with required consumables.
7. DG Power supply within 500 mtrs. From Boiler (Only for power failure during welding) including necessary cables and switches etc.
8. Consumables :
   (i) Annealing Cables
   (ii) Compensating Cables
   (iii) Glass Fiber Cloth - 1 mm x 1000 mm - Temp. rating 1260 deg. C.
9. Glass Fiber cord - Dia 3 mm (Twisted) - Temp. rating - 1260 deg. C.
10. Ceramic Fiber Blanket - RT Grade, Density 96 KG / Cub. M - Temperature rating - 1260 deg. C.
11. Ceramic Fiber rope - Fiber glass braided, dia 12mm - Temperature rating 1260 deg. C.
12. K- Type Thermocouple - 0.5 mm Dia single strand individual fiber glass insulated.
13. Heavy duty TC connectors for K- Type Thermocouples – Size 0.5 mm dia single strand individual fiber glass insulated.
14. All other consumables / equipment required to carry out the work.

ANNEXURE-I
BILLING SCHEDULE-Rev-01

1.0	Boiler and auxiliaries. (On the basis of quoted/ accepted rates per MT for Group-I to Group-IV).				
	Stages of payment	Percentage allocated			
		Group-I (Pr parts)	Group-II (Integral/ Trim piping)	Group-III (Non-pr parts)	Group-IV (Rotating machine)
1.1	Completion of pre-assembly	15%	----	15%	----
1.2	Placement in position	23%	34%	23%	34%
1.3	Alignment, grouting, welding including bolting as required & Non-destructive testing	35%	34%	37%	40%
1.4	Completion of stress relieving/ heat treatment	5%	5%	----	----
1.5	Bolting & completion hangers & supports etc wherever necessary	----	6%	6%	7%
1.6	Completion of hydraulic test (drainable)	2%	2 %	----	----
1.7	Completion of air & gas tightness test for equipment	1%	----	1.5%	1.5%
1.8	Boiler light up and ABO	2%	2%	2%	2%
1.9	Completion of acid/ EDTA/ chemical cleaning	2%	2%	2%	2%
1.10	On completion of steam blowing & Safety Valve floating	1%	1%	1%	1%
1.11	Coal firing	2%	2%	2%	2%
1.12	Full loading	2%	2%	2%	2%
1.13	Finish Painting	5%	5 %	5%	5%
1.14	Submission of as-built drawings	1%	1.5 %	----	----
1.15	Liquidation of pending points	2%	2 %	2%	2%
1.16	Reconciliation of issued materials	1%	0.5 %	0.5%	0.5%
1.17	Completion of all contractual Obligation and de mobilization of site office.	1%	1 %	1%	1%
	Total	**100 %**	**100 %**	**100%**	**100%**
2.0	The accepted rates per MT of PIPING (Group V ,VI & VII) shall be distributed in the following manner for releasing payments against RA bills:				
	Stages of payment			Percentage allocated	
				Piping	
2.1	Completion of pre-assembly			15 %	
2.2	Placement in position			24 %	
2.3	Alignment, welding, grouting & bolting as required			33 %	
2.4	Completion of nondestructive examination & stress relieving/ heat treatment			5 %	
2.5	Completion of hydraulic test(drainable)			2 %	
2.6	Pre-boiler system flushing/ chemical cleaning			2 %	
2.7	Boiler light up and ABO			2 %	
2.8	Completion of steam blowing			2 %	
2.9	Hot correction of hangers			2 %	

ANNEXURE-I
BILLING SCHEDULE-Rev-01

2.10	Coal firing	2 %
2.11	Full loading	2 %
2.12	Finish Painting	5 %
2.13	Submission of As-built drawings	1 %
2.14	Liquidation of pending points	1.5 %
2.15	Reconciliation of issued materials	0.5 %
2.16	Completion of all contractual Obligation and de mobilization of site office.	1 %
	Total	**100%**
3.0	The accepted rates per MT of ESP group (Group VIII) shall be distributed in the following manner for releasing payments against RA bills:	
3.1	Pre-assembly	15%
3.2	Placement in position	20%
3.3	Alignment, bolting, welding	35%
3.4	Gas tightness test of ESP	4%
3.5	Gas distribution test of ESP	3%
3.6	Comm. of collecting rapping sys	2%
3.7	Comm. of emitting rapp. Sys.	2%
3.8	Charging of all fields of ESP	2%
3.9	Light-up of the Unit	2%
3.10	Coal firing of the Unit	2%
3.11	Full Load of the Unit	2%
3.12	Finish painting	5%
3.13	Liquidation of pending points	2%
3.14	Reconciliation of issued materials	2%
3.15	Completion of all contractual Obligation and de mobilization of site office.	2%
	Total	**100 %**
4.0	The accepted rates per MT of FGD System (Group IX) shall be distributed in the following manner for releasing payments against RA bills:	
4.1	Pre-assembly	15%
4.2	Placement in position	23%
4.3	Alignment, bolting, welding	40 %
4.4	Air Gas tightness test	7.5 %
4.5	Light-up of the Unit	2 %
4.6	Coal firing of the Unit	2 %
4.7	Full Load of the Unit	2%
4.8	Finish painting	5 %
4.9	Liquidation of pending points	2%
4.10	Reconciliation of issued materials	0.5%
4.11	Completion of all contractual Obligation and de mobilization of site office.	1%
	Total	**100 %**
5.0	The accepted rates per MT of SCR System (Group X) shall be distributed in the following manner for releasing payments against RA bills:	
5.1	Pre-assembly	15%
5.2	Placement in position	23%
5.3	Alignment, bolting, welding	40 %
5.4	Air Gas tightness test	7.5 %
5.5	Light-up of the Unit	2 %
5.6	Coal firing of the Unit	2 %

ANNEXURE-I
BILLING SCHEDULE-Rev-01

5.7	Full Load of the Unit	2%
5.8	Finish painting	5 %
5.9	Liquidation of pending points	2%
5.10	Reconciliation of issued materials	0.5%
5.11	Completion of all contractual Obligation and de mobilization of site office.	1%
	Total	**100**
6.0	The accepted rates per MT of Insulation (Group XI) shall be distributed in the following manner for releasing payments against RA bills:	
6.1	Surface preparation/void closing/application of bituminus paints/hook welding etc	15%
6.2	Application/erection/wire binding finishing	50%
6.3	Completion of work, like sheeting, sealing completion etc	20%
6.4	BOILER LIGHT UP	2%
6.5	Steam Blowing	2%
6.6	Synchronization & Coal Firing	2%
6.7	Full loading	2%
6.8	Finish painting	5%
6.9	Liquidation of pending points	1%
6.10	Reconciliation of issued materials	1%
	Total	**100%**
7.0	The accepted rates per MT of Misc structures (Group XII) shall be distributed in the following manner for releasing payments against RA bills:	
7.1	Alignment	10%
7.2	Fabrication	25%
7.3	Erection	30%
7.4	Finish Painting	35%
	Total	**100%**
8.0	**PG test assistance.(On the basis of quoted/ accepted rate).**	
8.1	On completion of the PG test of the unit which is to be certified by the BHEL Engineer	**100%**
8.2	In case the PG Test assistance is not required, the payment towards this will not be considered	

ANNEXURE - 2

FORMAT FOR NO DEVIATION CERTIFICATE
(To be submitted in the bidder's letter head)

BHARAT HEAVY ELECTRICALS LIMITED,
Power Sector - Eastern Region,
Plot no 9/1, DJ Block, Sector – II, Salt Lake City,
Kolkata – 700 091

Sub	No Deviation Certificate.	
Job	ERECTION, TESTING, COMMISSIONING OF BOILER & AUXILIARIES INCLUDING FGD OF 1 X 660 MW UNIT-5, SAGARDIGHI TPP EXTENSION PROJECT.	
Ref	1.0	Tender no : PSER:SCT:SDG-B2090:20..
	2.0	BHEL's NIT, vide reference no. PSER:SCT:SDG-B2090:8303 Date: 07-12-2020.
	3.0	BHEL's TCN-01, vide reference no PSER:SCT: SDG-B2090:TCN-01 Date: 21-12-2020
	4.0	BHEL's TCN-02, vide reference no PSER:SCT: SDG-B2090:TCN-02 Date: 28-12-2020
	5.0	All other pertinent issues till date.

Dear Sirs,

With reference to above, this is to confirm that as per tender conditions, we have visited site before submission of our offer and noted the job content & site conditions etc. We also confirm that we have not changed/ modified the tender documents as appeared in the website/ issued by you and in case of such observance at any stage, it shall be treated as null and void.

We hereby confirm that we have not taken any deviation from tender clauses together with other references as enumerated in the above referred NIT. We hereby confirm our unqualified acceptance to all terms & conditions, unqualified compliance to technical specification, integrity pact (if applicable) and acceptance to reverse auctioning process.

In the event of observance of any deviation in any part of our offer at a later date whether implicit or explicit, the deviations shall stand null & void.

We confirm to have submitted/uploaded offer/documents in accordance with tender instructions with acceptance of the terms & conditions of the tender by us and as per aforesaid references.

Thanking you,

Yours faithfully,

(Signature, date & seal of authorized
representative of the bidder)