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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 confusion of any clause/ provision of this volume or any conflict/ inconsistency of any clause/ provision of this volume with that of other volume, the same shall be brought out by the bidder in writing to BHEL for clarification or during pre-bid discussions, if applicable, failing which most stringent interpretation 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 part of the tender.

CLAUSE NO	DESCRIPTION
<b>1.0</b>	<b>PROJECT SYNOPSIS AND GENERAL INFORMATION</b>
1.1	<p><b>Details of proposed Stage / Units</b></p> <p>Project name : BARTH SUPER THERMAL POWER PROJECT,STAGE-I</p> <p>No. of Units x capacity : 3 X 660 MW</p> <p>Project setting up by : National thermal Power Corporation</p> <p>Project Location : (i) Place :BARTH (ii) District :PATNA (iii) State : BIHAR</p> <p>Nearest Railway station : BARTH</p> <p>Distance of project location from the Railway station : 5.0 KM (Approx.)</p> <p>Nearest town : BARTH</p> <p>Distance of the town from the Project site : 5.0 KM</p> <p>Nearest Commercial Airport : PATNA</p> <p>Distance of airport from the project site : 70 KM</p>
1.2	<p><b>BRIEF SCOPE OF WORK</b></p> <p>As per VOLUME-IF-TS (TECH. SPECIFICATION)</p>
2.0	<p><b>SITE VISIT</b></p> <p>Contractor should visit site and acquire full knowledge and information about site conditions. The bidder must visit site, to acquaint himself with the conditions prevailing at site and in and around the plant premises at Barh, together with all the statutory, obligatory, mandatory requirements of various authorities before submission of the bid.</p>
3.0	<p><b>NAME OF WORK</b></p> <p>Completion of balance works of handling at site, storage yard, stores, transportation to site, erection, testing, commissioning and handing over of POWER CYCLE PIPING &amp; AUXILIARIES of Unit-1 &amp; Unit-2 of 3 X 660 MW Barh Project, Stage-I, Bihar.</p>
4.0	<p><b>DEVIATIONS</b></p> <p>The bidder is required to submit deviations proposed by him with his offer in the relevant schedule/ format without any ambiguity. Any assumptions, presumptions, deviations etc. indicated or implied anywhere by the bidder except those indicated in the deviation schedule/ format will not be recognized and will not form a part of consideration / offer. In the absence of such filled-up schedule/ format, it will be understood and agreed that the bidder's offer is based on strict conformance to the specification and no negotiation would be allowed in this regard. BHEL reserve the right not to recognize any / all deviations submitted after opening of the bid.</p>
5.0	<p><b>DEWATERING</b></p> <p>Contractor shall ensure at all times that his work area &amp; 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 catchments water, if required, at any time during execution of the work including monsoon period shall be considered by BHEL.</p>
6.0	<b>QUALITY CONTROL &amp; QUALITY ASSURANCE</b>
6.1	<b>INSPECTION &amp; FIELD QUALITY ASSURANCE</b>

6.1.1	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.
6.1.2	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.
6.1.3	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.
6.1.4	<p>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.</p> <p>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.</p> <p>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.</p> <p>Record of heat treatments (as applicable under the scope of this contract) performed shall be maintained as prescribed by BHEL.</p>
6.1.5	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. 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.
6.1.6	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.
6.1.7	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.
6.1.8	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.
6.2	<b>REQUIREMENT OF ISO 9001</b>
6.2.1	BHEL: PSER is accredited with ISO 9001 certification and as such this work is subject to various audits to meet ISO 9001 requirements.
6.2.2	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.
6.2.3	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.
6.2.4	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.			
6.3	<b>MMEs / MMRs</b>			
6.3.1	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.			
6.3.2	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.			
6.3.3	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.			
6.3.4	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.			
6.3.5	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.			
6.4	<b>INSPECTION BY TS / FES / QA ENGINEERS OF BHEL UNITS / ENGINEERING CENTRES</b>			
6.4.1	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.			
6.4.2	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.			
6.5	<b>PENALTIES ON VENDORS / SUB-CONTRACTORS AGAINST NON-COMPLIANCE OF QUALITY NORMS</b>			
SI. No.	Nature of Non-compliance	Penalty for Domestic Project	Penalty for Export Project	Remarks
<b>General</b>				
6.5.1	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
6.5.2	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
6.5.3	Not attending quality meeting of BHEL by nominated member of vendor / sub-contractor	Rs. 2,000.00	\$32.00	Per meeting
<b>CALIBRATION</b>				

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6.5.4	Use of MMEs without valid calibration certificate	Rs. 1,000.00	\$16.00	Per equipment per instance
6.5.5	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
<b>WELDING &amp; NDT</b>				
6.5.6	Unqualified welders carrying out welding / tack welding	Rs. 1,000.00	\$16.00	Per welder per instance. (Gatepass of the person shall be withheld)
6.5.7	Not using portable oven for welding consumables	Rs. 500.00	\$8.00	Per welder per instance. (The consumables in the oven shall be confiscated)
6.5.8	Not using electrodes pre-baked in baking oven	Rs. 500.00	\$8.00	Per instance. (The subject consumables shall be confiscated)
6.5.9	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)
6.5.10	Non-removal of welding slag and spatters after welding	Rs. 500.00	\$8.00	Per joint
6.5.11	Not using NDT equipment as prescribed in the manual / FQP / guidelines / Contract	Rs. 1,000.00	\$16.00	Per equipment per instance
6.5.12	Welder doing welding without valid job card	Rs. 500.00	\$8.00	Per instance
6.5.13	Discrepancy observed in the weld joints identified by BHEL / Customer for RT vs RT film offered	Rs. 2,000.00	\$32.00	per joint
<b>MATERIAL MANAGEMENT</b>				
6.5.14	Non-maintenance of grid pillar marking	Rs. 200.00	\$3.00	Per location week
6.5.15	Mismatch of location of material in store area w.r.t. location mentioned in stock register	Rs. 500.00	\$8.00	Per instance
6.5.16	Non-compliance of Preservation of material as per storage & preservation manuals	Rs. 1,000.00	\$16.00	Per equipment
6.5.17	Not offering received material for verification within stipulated time as per contract	Rs. 500.00	\$8.00	Per instance
<b>PAINTING &amp; ALLIED WORKS</b>				
6.5.18	Not using primer / paints of approved make and as per Specifications	Rs. 1,000.00	\$16.00	Per instance
6.5.19	Painting without proper surface preparation as per approved schedule / drawing / FQP	Rs. 500.00	\$8.00	Per instance
<b>PROTOCOLS &amp; LOG SHEETS</b>				
6.5.20	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

6.5.21	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
6.5.22	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) 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

## 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.

<b>7.0</b>	<b>QUALITY ASSURANCE PROGRAMME</b>
	Not in use
<b>8.0</b>	<b>GENERAL TECHNICAL REQUIREMENTS (CODES AND STANDARDS)</b>
8.1	Except where otherwise specified, the plant/ equipment shall comply with appropriate Indian Standard or an agreed internationally accepted Standard Specification as mentioned elsewhere in tender, 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.
8.2	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.
8.3	In the event of any conflict between the codes & standards referred above, and requirements of this specification, the requirements which are more stringent shall govern.
8.4	Tools used during erection and commissioning shall not be accepted except with the specific approval of the engineer.
8.5	Wherever specified or required the plant/ equipment shall conform to various statutory regulations 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.
<b>9.0</b>	<b>METHOD OF MEASUREMENT</b>
9.1	Where payment is to be made on the basis of weight, the weight per unit given in the BHEL document only shall be taken in to consideration. In case such information is not available in BHEL documents, then the latest relevant Indian Standards in this regard may be applied.
9.2	Spares, surplus quantity, erection contingency materials will not be paid for unless the same has been consumed in place of regular item of measurable work as per the rate schedule.
9.3	Where the payment is made on the basis of item rate, actual executed quantity measured jointly shall only be paid for.
9.4	It is clarified that as far as weight constituted by welding consumables and other consumables supplied by BHEL as well as by the contractor, shall be ignored for the purpose of payment.
9.5	BHEL Engineer's decision regarding stage of payment corresponding to progress of work, calculation of weight etc. will be final and binding on the contractor.
9.6	No separate payment will be made for grouting of equipments, structures etc

	specified elsewhere in these specifications.
9.7	Erection of Flow Nozzles, Flow Elements, Isolating Device etc. which are introduced after removing a part of the already erected pipeline, will be paid as per actual weight of these newly erected items. This will be in addition to the payment made for the portion being removed.
9.8	No separate payment will be made for the weight / volume of lubricant, oils, chemicals, gases, water, preservatives etc.
<b>10.0</b>	<b>HEALTH, SAFETY &amp; ENVIRONMENT</b>
10.1	Refer Document Number: HSEP:14-SGD Rev.: 00, DATE: 25.04.2019 Document Title: HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SUB-CONTRACTORS
<b>11.0</b>	<b>SERVICES TO BE RENDERED BY THE BIDDER</b>
	Services for construction, fabrication, equipment erection, testing as well as trial run & commissioning of various equipment and accessories under the contract shall include but not be limited to the following.
11.1	Issuing materials from store/ open yard from time to time for erection as per the construction programme, unless mentioned specifically elsewhere. 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 successful commissioning & trial run.
11.2	Transport of material to their respective places of erection (unless mentioned specifically elsewhere) and erection of the complete plant & equipment as supplied under this specification.
11.3	Trial run and commissioning of individual equipment/sub-systems to the satisfaction of owner/ BHEL.
11.4	Deployment of all skilled and unskilled manpower required for erection supervision, watch & ward, for commissioning and other services to be rendered under this specification.
11.5	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.
11.6	Supply of all consumables, eg welding electrodes, cleaning agents, diesel oil, lubricant etc as well as materials required for temporary supports, scaffolding etc as necessary for such erection work, unless specified other wise.
11.7	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.
11.8	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 eg Factory Inspector, Provident Fund authority etc. for respective portions of work under the jurisdiction of such statutes of laws.
11.9	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.
11.10	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 unfavourable 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 unfavourable construction conditions in no way relieve the contractor of his responsibility to perform the works as per the schedule.
11.11	The contractor shall supply all the skilled workmen like mill-wright fitters, welders, gas cutters, electricians, riggers, serangs, erectors, carpenters, pipe fitters, masons, liggers, 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 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.
11.12	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.
11.13	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.
11.14	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, co-ordinating his work with others and proceed in a manner that shall not delay or hinder the progress of work as a whole.
11.15	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.
11.16	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.
11.17	Any other service, although not specifically called for but required for a contract of the size and nature indicated in the specification.
<b>12.0</b>	<b>PROTECTION</b>
12.1	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.
12.2	Electrical equipments, controls and insulations 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.
12.3	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.
12.4	All other consumables including wire brush, emery papers, painting brush etc to be supplied by the contractor within the quoted rate.
<b>13.0</b>	<b>ERCTION SCHEDULE</b>
13.1	In order to achieve the overall completion schedule, the contractor shall provide

	BHEL all the information covering erection sequence, testing and commissioning activities. These schedules may be based on the recommended erection procedures and will be subject to discussions/ agreements with the owner/BHEL subsequent to the award of contract.
13.2	The successful bidder shall have to provide all the above schedules in a tabular form in addition to that in the form of network and these shall necessarily include information not limited to the earliest and latest dates for various activities submissions and also any related constraints.
<b>14.0</b>	<b>CONTRACT MANAGEMENT</b> The contractor should also submit network programmes for erection and commissioning of various items. These networks shall show the owner/ BHEL hold points (CHP/others) which have to be cleared by owner/ BHEL or their authorised representative(s) before further erection/ commissioning can take place. These programmes for the erection and commissioning would clearly identify responsibilities of the contractor and owner/ BHEL. Networks shall be submitted within 4 weeks of the date of finalisation of award of work/ placement of LOI.
<b>15.0</b>	<b>CONSTRUCTION MANAGEMENT</b>
15.1	Based on the PERT network programme, within 1 (one) month of the award of contract, the contractor shall submit a programme of construction/ erection/ commissioning, for the implementation. These programmes would be amplified showing start of erection and subsequent activities and shall form the basis for site execution and detailed monitoring. The three monthly rolling programme with the first month's programme being tentative based on the site conditions would be prepared based on these programmes. The contractor shall also be involved along with owner/ BHEL to tie up detailed resource mobilisation plan over the period of time of the contract matching with the performance targets.
15.2	The programme would be jointly finalised by the site in-charge of the contractor with BHEL/ owner's project coordinator as well as the site planning representative. The erection programme will also identify the sequential erectable tonnages.
<b>16.0</b>	<b>PROJECT PROGRESS REVIEW MEETINGS</b>
16.1	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.
16.2	The bidder shall make weekly plan jointly with BHEL site engineer and submit actual progress at the time of making next weekly plan. BHEL will not be able to provide inspection/ supervision, if the activity does not appear in the weekly plan.
16.3	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 owner/ BHEL will be decided upon as part of erection coordination procedure.
<b>17.0</b>	<b>SITE ORGANISATION</b>
17.1	The contractor shall maintain a site organisation of adequate strength in respect of manpower, construction machinery and other implements at all times for smooth execution of the contract. The organisation chart for site should indicate the various levels of experts to be posted for supervision in the various fields in erection, commissioning etc as applicable. For proper supervision of the work, the vendor shall ensure providing one qualified supervisor against deployment of 15 workmen. This organisation shall be reinforced from time to time, as required to make up for slippage from the schedule without any commercial implication to BHEL. The site organisation shall be headed by a competent construction manager having sufficient authority to take decisions at site.
17.2	The following four areas must be headed by mechanical engineers/supervisors.
17.2.1	Welding, radiography & hyd test - one no.

17.2.2	Mechanical erection - one no.
17.2.3	Material management, site enabling - one no.
17.2.4	Quality inspection engineer (Must have Level 2 certification in UT, RT & DPT) - one no.
17.3	On award of contract, the contractor shall submit to BHEL, their site organisation chart indicating the various levels of experts to be deployed on the job. BHEL reserves 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 deviations in this regard will not generally be permitted.
17.4	The contractor should also submit to BHEL for approval a list of construction equipment, erection tools, tackle etc. prior to commencement of site activities. These tools & tackles shall not be removed from site without written permission of BHEL.
<b>18.0</b>	<b>GENERAL GUIDELINES FOR FIELD ACTIVITIES</b>
18.1	The contractor shall execute the works in a professional manner so as to achieve the target schedule without any sacrifice on quality and maintaining highest standards of safety and cleanliness.
18.2	The contractor shall co-operate with owner/ BHEL and other contractors working in site and arrange to perform his work in a manner so as to minimise interference with other contractor's works. BHEL's engineer shall be notified promptly of any defect in other contractors' works that could affect the contractor's work. If rescheduling of contractor's work is requested by the owner's/ BHEL's engineer in the interest of overall site activities, the same shall be compiled with by the contractor. In all cases of controversy, the decision of BHEL shall be final and binding on the contractor without any commercial implication.
18.3	The engineer shall hold weekly meeting of all the contractors working at site at a time and a place to be designated by the engineer. The contractor shall attend such meetings and take notes of discussions during the meeting and the decisions of the engineer and shall strictly adhere to those decisions in performing this work. In addition to the above weekly meeting, engineer may call for other meetings either with individual contractors or with selected number of contractors and in such a case the contractor, if called will also attend such meetings.
18.4	Time is the essence of the contract and the contractor shall be responsible for performance of his work in accordance with the specified construction schedule. If at any time the contractor is falling behind the schedule, he shall take necessary action to make good of such delays by increasing his work to comply with the schedule and shall communicate such action in writing to the engineer, satisfying that his action will compensate for the delay. The contractor shall not be allowed any extra compensation for such action.
18.5	The engineer shall however not be responsible for provision of additional labour and or materials or supply of any other services to the contractor except for the co-ordination work between various contractors as set out earlier.
18.6	The works under execution shall be open to inspection & supervision by BHEL's / Owner's engineer at all times. The contractor shall give reasonable notice to BHEL before covering up or otherwise placing beyond the reach of inspection any work, in order that same may be verified, if so desired by owner/ BHEL.
18.7	Every effort shall be made to maintain the highest quality of workmanship by stringent supervision and inspection at every stage of execution. Manufacturer's instruction manual and guidelines on sequence of erection and precautions shall be strictly followed. Should any error or ambiguity be discovered in such documents the same shall be brought to the notice of BHEL's engineer. Manufacturer's interpretation in such cases shall be binding on the contractor.
18.8	The contractor shall comply with all the rules and regulations of the local authorities, all statutory laws including Minimum Wages, Workmen Compensation etc. All registration and statutory inspection fees, if any, in respect of the work executed by the contractor shall be to his account.
18.9	All the works such as cleaning, checking, levelling, blue matching, aligning, assembling, temporary erection for alignment, opening, dismantling of certain equipment for checking and cleaning, surface preparation, edge preparation,

	fabrication of tubes and pipes as per general engineering practice at site, cutting, grinding, straightening, chamfering, filling, chipping, drilling, reaming, scrapping, shaping, fitting-up, bolting/ welding, etc as may be applicable in such erection and necessary to complete the work satisfactorily, are to be treated as incidental and the same shall be carried out by the contractor as part of the work.
18.10	It is the responsibility of the contractor to do the alignment etc if necessary, repeatedly to satisfy engineer, with all the necessary tools & tackles, manpower etc. The alignment will be complete only when jointly certified so, by the contractor's engineer and BHEL. Also the contractor should ensure that the alignment is not disturbed afterwards.
18.11	Equipment and material, in case wrongly installed, shall be removed and reinstalled to comply with the design requirement at the contractor expense, to the satisfaction of BHEL/ owner.
18.12	After identification of erection materials by BHEL at BHEL's store/ storage yard, it shall be the responsibility of the contractor to take delivery of materials from BHEL's store/ storage yard by contractor's own manpower and re-stack the leftover materials as per erection sequence at BHEL store at their own cost. The entire activities are to be carried out under supervision of BHEL's MM engineer.
19.0	<p><b>CERTIFICATE TOWARDS COMPLETION</b></p> <p>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.</p>
20.0	<p><b>PROJECT MANAGEMENT</b></p> <p>The successful bidder will have to establish computerised project management system and the following are the essence of the system.</p>
20.1	<b>PLANNING &amp; MONITORING</b>
20.1.1	The bidder shall prepare detail construction schedule (L-3) as per completion dates given in this document. This schedule must include all milestone and key activities for each sub-systems / components in the areas of engineering (wherever applicable), procurement, manufacture (wherever applicable), recogniz, excavation/ construction/ erection. This network must conform to the overall project schedule. The bidder should also ensure monitoring of these activities at least weekly basis to start with and on daily basis whenever required by BHEL.
20.1.2	The bidder shall also prepare progress report indicating progress on key activities, management summary for critical activities, list of actions requiring attention of BHEL. This schedule is to be preferably made in PRIMAVERA/ MS PROJECTS, so that the same is compatible with BHEL's project management software.
20.1.3	<p>The bidder will have to Supply &amp; install of 1 No. PC (multimedia PC work station Pentium- Core-i5-650, 3.2 GHZ or above, 1 TB HDD, 8 GB RAM, 100 /1000 MBPS LAN card) of HP / HCL / COMPAQ / LENEVO or equivalent make with window 10 or higher, 64 bit (with roll back to 32 bit O/S and required software like MS Office 2016 or higher, AutoCAD 2014 or higher, ADOBE PDF CREATOR with 1 No. A4 Colour laser printer as per instruction of BHEL for exclusive use of BHEL. These computers / printer / Multifunction shall remain Vendors property and they will be allowed to take out the same after closing of contract. 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.</p> <p>The contractor shall also provide 1 (One) Number computer operators and 1 (One) number service staff for miscellaneous service for BHEL's use at site / Kolkata for reconciliation, progress review &amp; day-to-day planning purpose, documentation etc. These facilities are to be provided within 30 days from LOI date till completion of scheduled contract period.</p> <p>If BHEL do not availed the service of computer / printer / personnel as per requirement, BHEL shall have the right to deduct the amount as per following rates on prorate basis, from contractor's RA bill or any other dues.</p>
20.1.3.1	@ Rs. 12,000/- (twelve thousand)/ month for each computer operator or at actual (rate +30%) if BHEL arranges this facility, whichever is lower.

20.1.3.2	@ Rs 8,000/- (eight thousand)/ month for each computer with printer or at actual (rate +30%) if BHEL arranges this facility, whichever is lower.
20.1.3.3	@ Rs 9,000/- (nine thousand) / month for each service staff or at actual (rate +30%) if BHEL arranges this facility, whichever is lower.
20.1.3.4	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 above mentioned rate or actual +15%, whichever is lower, if the services of operator / service staff are being used by BHEL.
20.1.3.5	The contractor's site office must have facilities of communications like E-mail, and telephone / mobile phones within a month from LOI.
20.2	<b>PROGRESS REPORTING</b>
20.2.1	The bidder shall submit daily, weekly and monthly progress reports for work force, materials reports, consumables (gases/electrodes) report and other reports as per pro-forma considered necessary by the BHEL. In case of any failure on contractor's part to comply with this, BHEL may at its discretion, consider to withhold part payment against their RA bills.
20.2.2	The progress report shall indicate the progress achieved against planned with reasons indicating delays, if any, and shall give the remedial actions which the contractor intends to take to make good the slippage or lost time, so that further works again proceed as per the original program and the slippages do not accumulate and effect the overall program.
20.2.3	The daily work force reports shall clearly indicate the work force deployed, category-wise specifying also the activities in which they are engaged.
20.2.4	Weekly progress review meetings will be held at site during which actual progress during the week vis-à-vis scheduled program shall be discussed or actions to be taken for achieving targets. For discussions, the contractor shall present program of subsequent week. The contractor shall constantly update/revise his work program to meet the overall requirement.
20.2.5	Periodic progress reviews on the entire activities of execution in respect of supply and works in scope of bidder will be held once in a month at 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. The contractor shall be further responsible for ensuring that suitable steps are taken to meet various targets decided upon such meetings.
20.3	Still colour photography (matt paper, post card size, max 10 nos per month of contract execution period) depicting progress of work, damage to the machine parts (if any) as directed by BHEL engineer is to be arranged by the successful bidder.
20.4	The successful bidder has to arrange for printing & binding of the protocol and/ or report and/ or data, pertaining to the scope of the bidder. Contents, layout, design, quality of paper/ cover, no of copies etc of such printing and/ or binding will be decided by BHEL.
20.5	The successful bidder shall have to provide BHEL with all erection/ work schedule and or progress report, protocol, test report in floppies (compatible to BHEL software) and also in requisite no of hard copies. A copy of progress report needs to be sent to BHEL Project Manager/ Kolkata latest by 7th of every month for incorporation in the overall project progress report.
<b>21.0</b>	<b>GENERAL</b>
21.1	It is imperative on the part of the contractor to join and effectively contribute in joint measures such as tree plantation, environment protection, contributing towards social upliftment, conversion of packing woods to school furniture, keeping good relation with local populace etc.
21.2	The contractor shall maintain proper store account for all the BHEL issued materials/ items/ equipment and shall give three copies of monthly statement of such account to the BHEL.
21.3	The contractor shall solely be responsible for the safety, quality and quantity of materials/ items/ equipment after it is issued by the BHEL.
21.4	BHEL issued materials/ items/ equipment shall not under any circumstances whatsoever, shall be taken out of project site unless otherwise permitted by BHEL.
21.5	The contractor shall satisfy himself of the quality and quantity of the materials/ items/ equipment at the time of taking delivery from BHEL/ customer stores. No claim

	whatsoever will be entertained by BHEL on account of quality or quantity after the same are taken by the contractor from BHEL/ customer.
21.6	Surplus and unused materials/ items/ equipment shall be returned separately at a place directed by BHEL engineer within the project area. Return of such materials/ items/ equipment will not be entitled to any erection/ transportation and incidental charges.
21.7	The contractor shall submit a reconciliation statement of materials/ items/ equipment drawn by him from BHEL/ customer stores periodically as per instruction of BHEL. The closing balance shall be verified at the time of reconciliation.
22.0	<p><b>COMMUNICATION</b></p> <p>P&amp;T line, Fax, Telex etc, as required by the contractor, is to be installed by the contractor at his own cost after obtaining necessary approval from purchaser/ BHEL.</p>
23.0	<p><b>IMTE</b></p> <p>The contractor shall ensure deployment of reliable &amp; calibrated instrument, measuring &amp; test equipments (IMTE). The IMTE shall have test/ calibration certificate from authorised/ Govt approved agencies. The contractor shall also keep provision of alternate arrangement for such IMTE so that the work does not suffer when a particular IMTE 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.</p>
24.0	<p><b>TEST CERTIFICATE FOR T&amp;P</b></p> <p>All T&amp;Ps, lifting tackles, pulling devices, wire rope and slings to be deployed by the contractor must bear valid/latest test certificates for their suitability, and the documents shall be preserved at site.</p>
25.0	<p><b>INSURANCE</b></p>
25.1	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.
25.2	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.
25.3	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.
25.4	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.
25.5	Other conditions of Insurance shall be as per relevant clause of GCC/SCC.
26.0	<p><b>FACILITIES TO BE PROVIDED BY BHEL/ CUSTOMER</b></p>
26.1	<p><b>FIELD/ SITE OFFICE</b></p>
26.1.1	The contractor shall make his own arrangements for field office and stores for accommodating necessary equipments, tools room for execution of the work. Only open space will be provided by BHEL / customer, free of charges within the project premises as per the availability of space.

	In addition to his site office, the contractor shall arrange a temporary store near the site of erection for temporary storage of small materials like fasteners, gaskets, valve and fittings and other instruments. The necessary structural steel, sheeting, racks etc. for this work shall be arranged by the contractor at his cost.
26.1.2	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. If contractor is failed to do so, BHEL will get the job done through other agency and the cost 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.
26.2	LAND
26.2.1	The contractor has to plan and use the existing land inside the Project Premise 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 erections 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
26.2.2	Land for labour colony near Project Premise may be available free of cost from owner , the contractor shall construct labour colony/ hutment as per his requirements after obtaining approval of formalities from statutory body.
26.2.3	The contractor will be responsible for handing back all lands, as handed over to him by BHEL/NTPC
26.2.4	Land within plant premises for fabrication, batching plant, office, storage area etc. for construction purpose shall be provided as per availability free of cost.
26.2.5	The contractor shall make his own arrangements for Site /field office and stores for accommodating necessary equipments, tools room for execution of the work. Only open space will be provided by BHEL / customer, free of charges within the project premises as per the availability of space.
26.2.6	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.
26.3	WATER
26.3.1	BHEL will provide construction as well as drinking water at one point, within 500 m from given work premises for works within the plant boundary, free of cost to the contractor.
26.3.2	Further necessary network for construction & drinking water system shall be done by the bidder at his own cost.
26.3.3	Contractor should arrange on their own, drinking water in their labour colony .
26.3.4	For works outside the plant boundary, bidder has to arrange water on their own cost.
26.3.5	However, if available from Inside plant boundary area, construction/drinking water may be provided by BHEL to the vendor, if desired by vendor. Vendor has to make necessary arrangement of distribution from this point to his work area out side plant boundary at his own cost.
26.3.6	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.
26.3.7	Contractor will have to arrange for storage of water to meet the day-to-day requirement.
26.3.8	The availability of water (construction as well as drinking) in Barh project 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.
26.4	ELECTRICITY

26.4.1	<b>CONSTRUCTION POWER &amp; GENERAL ILLUMINATION NETWORK (for works within Plant boundary) :-</b>
26.4.1.1	BHEL Shall Provide Construction Power free of charge at one point. Bidders have to make his own distribution arrangement to draw electricity. <b>GENERAL ILLUMINATION WORKS:-</b> Overall area illumination will be provided by BHEL. However for night working, contractor should arrange illumination as and when required by them.
26.4.1.2	The bidder shall have to provide earth leakage circuit breaker at each point wherever human operated electrical drives/T&Ps are deployed.
26.4.1.3	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.
26.4.1.4	Bidder will have to arrange sufficient illumination at their own work areas.
26.4.1.5	The contractor should ensure that the work in critical areas is not held up in the event of power breakdown. In the event of breakdown in the electric supply, if the progress of work is hampered, it will be the responsibility of the contractor to step up the progress of work after restoration of electric supply so that overall progress of work is not affected.
26.4.1.6	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.
26.4.1.7	Power required for labour colony shall not be provided by BHEL.
<b>27.0</b>	<b>AREA REQUIREMENT /OTHER FACILITIES TO BE PROVIDED BY CONTRACTOR</b>
27.1	Contractor shall be responsible for providing all necessary facilities like residential accommodation, transport, electricity, water, medical facilities etc. as required under various labour laws and statutory rules and regulations framed there under to the personnel employed by him.
27.2	Contractor shall arrange at his own cost the construction of his temporary office, stores etc, and also the watch and ward of all above. 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.
27.3	Round the clock experienced paramedical personnel with first aid facility & one ambulance including driver, fuel etc., and shall be available at site, being provided by other agency. The above facilities will be shared by various BHEL contractors working at site on chargeable basis to the providing agency (actual cost distributed among the various vendors present at site availing the facility on a prorate basis). The subject facility will be strengthened as per the requirement during peak work progress at site, by other vendor. Individual vendor may co-ordinate with the providing agency in this regard.  No medical facility within / near the site shall be provided by BHEL.
27.4	On completion of work or as and when required by BHEL, all the temporary buildings, structures, pipe lines, cables etc. shall be dismantled and leveled and debris shall be removed as per instruction of BHEL Engineer. In case of his failure to do so, same will be got done by the Engineer and expenses incurred shall be recovered from the contractor along with prevailing overhead. The decision of BHEL Engineer in this regard shall be final and binding on the contractor.
27.5	The contractor shall be responsible for handing back all lands, as given to him for his temporary use, to BHEL, as per the instruction of BHEL Engineer.
27.6	<b>RESPONSIBILITIES WITH REGARD TO LABOUR EMPLOYMENT ETC.</b>
27.6.1	The contractor has to follow relevant clauses of General Conditions of Contract in this regard

27.6.2	Contractor shall also comply with the requirements of local authorities/ project authorities calling for police verification of antecedents of the workmen, staff etc. Exclusive planning engineer/supervisor, QA and Safety Engineer/officer are to be arranged by the contractor within the quoted rate.
27.6.3	BHEL / customer may insist for witnessing the regular payment to the labour. They may also like to verify the relevant records for compliance with statutory requirements. Contractor shall enable such facilities to BHEL / customer.
27.6.4	It is the responsibility of the contractor to arrange gate pass for all his employees, T&P etc for entering the project premises. Necessary coordination with customer officials is the responsibility of the contractor. Contractor to follow all the procedures laid down by the customer for making gate passes. Where permitted, by customer / BHEL, to work beyond normal working hours, the contractor shall arrange necessary work permits for working beyond normal working hours. Arranging all erection/commissioning fixtures including required materials and fabrications etc. are included in the contractor's scope of work.
27.6.5	Contractor shall provide at different elevation suitable arrangement for urinal and drinking water facility with necessary plumbing & disposal, regular cleaning, upkeepment arrangements including construction of septic tank. These installations shall be maintained in hygienic condition at all times. Contractor's quoted rate should be inclusive of this aspect.
27.6.6	If at any time during the execution of work, it is noticed that the work is suffering on account of non-availability/shortfall in provision of resources from the contractor's side BHEL will make suitable alternate arrangements at the risk and cost of contractor in case of slippage from the vendor's end. The expenditure incurred with overheads thereby shall be recovered from the contractor.
<b>28.0</b>	<b>CONSTRUCTION OF TEMPORARY OFFICE ETC</b> The contractor shall arrange at his own cost the construction of his temporary office, stores, etc and also the watch & ward of all above. On completion of the awarded job, the vendor shall demolish his office and clear the land of debris for handing over the area in as issued condition.
<b>29.0</b>	<b>TOOLS AND PLANTS</b>
29.1	The contractor is required to provide all necessary tools & plants, measuring (calibrated) instruments and handling equipment for timely completion of the total works as per contract. The quoted rate shall be inclusive of such requirements.
29.2	In the event of any failure of the part of the contractor, BHEL may at his discretion also terminate the contract on this ground and take out any or whole amount of the contract from the scope of the contractor. Decision of BHEL in this regard will be final and binding on the contractor.
29.3	The T&Ps to be arranged by the contractor shall be in proper working condition.
29.4	The list of T&Ps indicated in relevant annexure are minimum expected to be provided by the contractor. In case, due to approach constraint it is found that crane of capacity higher than those specified in Annexure-I, is required for carrying out the work, the same has also to be arranged by the contractor within his quoted rate.
29.5	All other tools and plants required for the work including cranes, electric/ hand/ pneumatic winches, tractor-trailers, trucks, welding generators/ transformers, jacks, slings, pulley blocks, TIG/ ARC welding equipment, electrode drying ovens, hydraulic pipe bending machines etc and small tools and plants like chisels, scrappers, spanners, files, screw drivers, electrical tools kits etc required for timely completion of work shall be arranged by the contractor at his own cost. The contractor shall give a list of such equipment to be deployed by them giving details like nos. available with them, nos. to be deployed, capacity etc of each item and the same shall be binding on the contractor during the execution of contract. It may specifically be noted that all T&P's required for smooth and timely completion of work shall be arranged by the contractor at his own cost and BHEL project manager's decision regarding the requirement of a particular item shall be binding on the contractor. The equipment once deployed at site shall not be removed from site without the written consent of BHEL, Construction Manager. In case contractor

	cannot mobilise sufficient T&P and major tools for timely completion of the project, BHEL will have the right to procure the same from outside and cost of the same along with overhead expenses will be deducted from the contractor's bill.
29.6	Sufficient quantities of guy ropes shall be arranged by the contractor for erection/ alignment of columns.
29.7	All tools & plants deployed by the contractor shall be as per the specification approved by BHEL engineers.
29.8	All the T&P, lifting tackles including wire ropes, slings, shackles and electrically operated equipment shall be approved by BHEL engineer before they are actually put on use.
29.9	The list of major T&P required to be deployed is indicated in Annexure-I. The list is minimum and not exhaustive but anything required over and above these to suit the site condition/ rate of progress/ nature of work shall be arranged by contractor at his own cost.
29.10	The contractor is required to provide all necessary T&P (other than those specified to be provided by BHEL, if any) measuring (calibrated) instruments & handling equipments to maintain work progress for timely completion of total work as per contract. In case of project requirement, some activities may have to pre-pone. In such cases the contractor have to deploy additional T&P. Quoted rate shall be inclusive of such emerging requirements. However, contractor shall submit deployment plan of all T&P along with tender bid.
29.11	Lifting of silencers on the rooftop of the boilers with associated pipings is included in the scope of work. The contractor shall deploy crane of required capacity or make alternate arrangement for placement of the silencers at such high elevation on the rooftop of the boilers within the quoted price.
29.12	Actual Mobilisation schedule, based on front availability, drawaings and material availability at site is to reviewed and mutually agreed with BHEL site periodically from time to time & form a joint MOM for moblisation of major T&Ps, and the same have to be adhered to and no change will be permitted without written approval of BHEL site. Further requirement will be reviewed time to time at site and contractor will provide additional T&P/ equipments to ensure completion of entire work within schedule time without any financial implication to BHEL. All other T&Ps shall be provided by the contractor without any extra cost to BHEL. Vendor will give advance intimation & certification regarding capacity etc prior to dispatch of heavy equipments.
29.13	In the event of non mobilisation of any T&P by the successful bidder and as a result progress of work suffered, BHEL reserves the right to deduct suitable amount from the dues of the bidder, with assigning reasons thereof.
29.14	After completion of major quantum of work, vendor may be permitted to take out any of his T&P progressively, if deemed fit by BHEL Site as per balance work program. The same will be jointly agreed and recorded. BHEL decision in this regard will be final and binding on the vendor.
29.15	For the movement of crane, etc, it may become necessary to lay sleeper bed or any other material for obtaining levelled safe approach, for usage of equipment. It shall be contractor's responsibility to arrange and lay the necessary materials for this. Steel plates, if required, shall be supplied by BHEL, free of cost on returnable basis.
29.16	All the T&P arranged by contractor including electrical connections wherein required shall be reliable/ proven/tested with necessary test certificate.
<b>30.0</b>	<b>TOOLS AND PLANTS TO BE PROVIDED BY BHEL (SHARED MACHINERY)</b>
30.1	No T&P/Crane will be provided by BHEL for the scope of work under this contract.
30.2	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.
<b>31.0</b>	<b>CONSUMABLE</b>
31.1	All consumables, like gas, electrodes, tig filler wire, chemicals/ Lubricants of

	contractor's T&Ps etc required for the job shall be arranged by the contractor at his cost.
31.2	All consumables to be used for the job shall have to be approved by BHEL prior to use.
31.3	In the event of failure of contractor to bring necessary and sufficient consumables, BHEL shall arrange for the same at the risk and cost of the contractor. The entire cost towards this alongwith standard BHEL overhead shall be deducted from the contractor's immediate due bills.
31.4	All electrodes required for MS, carbon steel, stainless steel, alloy and other metals shall be supplied by the contractor after due approval of BHEL and as per design requirement within this quoted rate. It shall be the responsibility of the contractor to obtain prior approval of BHEL, before procurement regarding suppliers, type of electrodes etc. On receipt of the electrodes at site, it shall be subject to inspection and approval by BHEL. The contractor shall inform BHEL regarding type of electrodes, batch number and date of expiry etc. Test certificates for electrodes and other consumables should be submitted to BHEL engineer as per requirement.
31.5	Storage of electrodes shall be done in a air-conditioned / controlled humidity atmosphere as per requirement, at his own cost by the contractor.
31.6	In case of improper arrangement for procurement of above electrodes, BHEL reserves the right to procure the same from any source and recover the cost from the contractor's first subsequent bill at market value plus the departmental charges of BHEL communicated from time to time. Postponement of such recovery is not permitted.
31.7	BHEL reserve the right to reject the use of any electrodes at any stage, if found defective because of bad quality/ improper storage/ quality date expiry/ unapproved type of electrodes etc. It shall be the responsibility of the contractor to replace at his cost without loss of time.
31.8	Contractor shall submit weekly/ fortnightly/ monthly statement/ report regarding consumption and available stock of all types of electrodes for avoiding stoppage of work on consumable scarcity.
31.9	All the required gases like oxygen, acetylene, argon, nitrogen etc. required for work shall be supplied by the contractor at his cost. It shall be the responsibility of the contractor to plan the activities and store sufficient quantity of these gases. The contractor shall submit weekly/ fortnightly/ monthly statement report regarding consumption and stock position of the above gases. Safe keeping of inflammable cylinders, distribution using gas manifolds shall be contractor's responsibility. BHEL reserve the right to reject the use of any gas in case required purity is not maintained.
31.10	Sufficient quantity of test plates and pipes as considered adequate for testing contractor's welders will be supplied by BHEL. All other expenses in conducting the tests shall be borne by the contractor.
31.11	All temporary piping material necessary for conducting hydraulic test will be provided by BHEL. However servicing, erection & dismantling of the same and depositing at BHEL stores is the responsibility of the contractor without extra charges. Pressuring pump required for conducting hydraulic test need to be arranged by vendor with in his quoted rate.
<b>32.0</b>	<b>COMPLETION PERIOD</b>
32.1	Entire work of erection, testing, commissioning etc shall be completed within a period of 3 (three) months for UNIT-I from the date of start of work and 13 (thirteen) months for UNIT-II from the date of start of work.
32.2	The contractor should arrange to mobilise and start the erection work within 15 days from the date of LOI unless otherwise intimated by BHEL.
32.3	The erection, testing, commissioning etc will be deemed to be completed in all respects, only when the trial runs of individual system is over and the unit is handed over to customer after successful trial operation with MCR. The decision of BHEL in this respect shall be final and binding on the contractor.
<b>33.0</b>	<b>CONSTRUCTION SCHEDULE</b>
33.1	PROJECT MILESTONES OF UNIT # 1 (Tentative)

Sl no	Milestone	Schedule
1.0	Full Loading	SEPTEMBER 2020
PROJECT MILESTONES OF UNIT # 2 (Tentative)		
Sl no	Milestone	Schedule
1.0	Steam Blowing	DECEMBER 2020
2.0	Turbine Rolling	FEBRUARY 2021
3.0	Synchronization.	MARCH 2021
33.2	The contractor shall plan his piping /other system readiness accordingly to meet this above milestone schedule, in co-ordination with BHEL Site.	
33.3	A bar chart showing various activities and various piping system is to be submitted by the contractor within one month from date of LOI to Construction Manager, BHEL, Barh for approval.	
<b>34.0</b>	<b>TAXES, DUTIES ETC</b>	
34.1	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. Bidder's quoted/ accepted rates/ price shall be inclusive of all such requirements.	
34.2	GST along with Cess (as applicable) legally leviable& payable by successful bidder as per GST Law shall be paid by BHEL, extra. Hence, bidder shall not include GST along with Cess (as applicable) in their quoted rates/ price.	
34.3	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.	
34.4	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.	
34.5	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.	
34.6	TDS under GST shall be deducted at applicable rates on gross invoice value from the running bills (RA bills).	
34.7	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.	
34.8	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.	
34.9	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.	
34.10	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.	
34.11	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.
34.12	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.
34.13	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.
34.14	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.
34.15	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.
34.16	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.
<b>35.0</b>	<b>CONTRACT PRICE</b>
35.1	Bidder shall quote their rates strictly in accordance with prescribed Price Schedule, Volume-III, in separate sealed envelopes.
35.2	The total price quoted in Price Schedule, Volume-III, shall be considered for evaluation & awarding.
35.3	The quantities of various items mentioned in the BOQ cum price schedules of items of 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 the this contract including extra items, if any, but excluding any price variation remains, if any, remains within (+/-) 15 % (plus/minus fifteen percent) of the awarded price.
<b>36 .0</b>	<b>INTERIM PAYMENTS</b>
36.1	For all items of work as per Volume-III, Price Schedule, interim payment shall be limited to 95 % of the gross value of interim bill on item rate basis as per the Billing schedule. The balance 5 % shall be payable on completion of guarantee period and subject to confirmation of full GST. However, this 5 %, retained from each RA bill, may be released against submission of a separate bank guarantee as per Performance Bank Guarantee format, to be kept valid till final bill & guarantee period, subject to (i) Receipt of certificate that all works are completed in all respects; (ii) Reconciliation of materials / T&P / IMTE; (iii) Completion of final bill formalities (iv) handing over to BHEL / customer and (v) subject to confirmation of full GST. Any Interest if levied thereon for reasons elaborated in Tax & duties clause of the contract and attributable to you shall be recovered for the Final Payment/ Retention amount.
36.2	All admissible recovery / adjustments etc. shall be made from the interim payable amount.
36.3	Out of this 95 %, 1.5 % of gross bill amount shall be paid 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.	
36.3.1	0.7 % shall be paid on compliance of house keeping of vendor's working area and store/ office areas.	
36.3.2	0.3 % shall be paid on compliance of general illumination of vendor's working area and stores, office area.	
36.3.3	0.2 % shall be paid on compliance of applicable OHSAS requirement as per guidelines of BHEL/ PSER and as specified in the tender.	
36.3.4	0.3 % shall be paid on compliance of applicable safety requirement as per guidelines of BHEL/ PSER and as specified in the tender.	
36.4	BHEL site at its discretion may further split up the above percentages of break up and effect payment to suit the site condition, cash flow requirement, according to the progress of work.	
36.5	The contractor shall submit his running bill, once in a month at the end of each month. The RA bill complete in all respect, accompanied by BHEL engineers certified measurement sheets, jointly signed, will be paid after 45 days of submission of bill, subject to completeness and correctness. Income Tax at the prevailing rates on gross value of work done & applicable surcharge shall be deducted from contractor's bill, unless exempted by Income Tax Authority.	
36.6	Applicable GST, which can be claimed at any point, shall be released to you upon compliance of following:	
36.7	You declaring such Invoice in your GSTR-1	
36.8	Receipt of Goods / services and Tax Invoice by BHEL	
36.9	Confirmation of payment of GST thereon by you on GSTN Portal	
36.10	Above is subject to receipt of goods / service and tax invoice thereof along with you declaring invoice in your return and paying GST within timeline prescribed for availing ITC by BHEL.	
36.11	Confirmation of full GST credit to BHEL. Any Interest if levied thereon for reasons elaborated in taxes, duties clause of the tender, which is not attributable to BHEL, will be recovered from final payment/ retention/ securities.	
36.12	Out of above 80 %, following percent allocations of gross bill amount shall be paid on certification by BHEL after compliance of each of following activity in each month. In case of non-fulfillment of respective activity by successful bidder in each month, no payment shall be made by BHEL against corresponding activity and no claim of successful bidder, at a later date, whatsoever, in this regard will be entertained by BHEL.	
	ACTIVITY	
36.12.1	House-keeping of successful bidder's working area and store/ office areas.	
36.12.2	General illumination of successful bidder's working area and stores, office area.	
36.12.3	Applicable OHSAS requirement as per guidelines of BHEL and as specified in the tender.	
36.12.4	Applicable safety requirement as per guidelines of BHEL and as specified in the tender.	
36.12.5	Applicable security requirement as per guidelines of BHEL.	
36.12.6	Total	
36.13	Successful bidder shall fulfill all formalities for final billing/ contract closing and certification of completion of all service activities.	
36.14	GST can be claimed at any point of contract and payment shall be released upon compliance with following.	
36.14.1	Your declaration that billing/ invoicing in GSTR-1.	
36.14.2	Receipt of goods/ services and tax invoice by BHEL.	
36.14.3	Confirmation of payment of GST thereon by vendor on GSTN Portal.	
36.14.4	Above is subject to receipt of goods/ service and tax invoice thereof along with declaring invoice in your return and paying GST within timeline prescribed for availing ITC by BHEL.	
36.15	Unless otherwise directed by PM, PMX, BHEL, Kolkata or CM, BHEL site,	

	successful bidder shall submit jointly signed L2 schedule for service vs actual status with each RA bill.
36.16	No extra payment shall be made in the event of deferment in payment.
36.17	All admissible recovery/ adjustment, etc shall be made from progressive payment.
36.18	BHEL site/ HQ at their discretion may further split up percentages of above stages & billing break-up and effect payment to suit site condition, cash flow requirement and according to the progress of work.
<b>37.0</b>	<b>MOBILISATION ADVANCE AND INTEREST BEARING RECOVERABLE ADVANCE</b> Not applicable for this tender.
<b>38.0</b>	<b>OVER RUN COMPENSATION</b> As per relevant clause of GCC, subject to a minimum amount of Rs. 50,000=00 per month and maximum amount of Rs. 5,00,000=00 per month.
<b>39.0</b>	<b>RATE REVISION &amp; PRICE VARIATION COMPENSATION (PVC)</b> Not applicable for this tender.
<b>40.0</b>	<b>SECURITY DEPOSIT &amp; PERFORMANCE BOND</b> Security Deposit shall be applicable as per GCC. Performance Bond is not applicable for the subject tender.
<b>41.0</b>	<b>EXTRA WORK FOR RECTIFICATION/ MODIFICATION</b>
41.1	As per relevant clause of GCC.
<b>42.0</b>	<b>LIQUIDATED DAMAGES (Unit wise)</b>
42.1	If the contractor fails to maintain the required progress of work which results in delay in the completion of the following works as per the contractual completion period indicated for individual areas indicated below, BHEL shall have the right to impose Liquidated Damage/Penalty at the rate of 0.5% of the contract value (derived contract value of respective unit), per week of delay or part thereof subject to a maximum of ceiling specified below. For this purpose, the period of delay shall be the delay attributable to the Contractor for the completion of work as per contract. Contract Value for this purpose, shall be the final executed value exclusive of ORC, Extra Works executed, Supplementary/ Additional Items and PVC.
42.2	If Completion of Total Job goes beyond 3 (three) months for UNIT-I from the date of start of work and 13 (thirteen) months for UNIT-II from the date of start of work (for the reasons attributable to vendor), maximum LD amount 10% of total contract value. The maximum LD shall be limited to 10% of the total Contract Value.
42.3	In case of LD recovery, the applicable GST shall also be recovered from vendor/Contractor/ suppliers
42.4	All other terms & conditions shall be as per provision of Volume-IB.
<b>43.0</b>	<b>GUARANTEE</b>
43.1	Even though the work will be carried under supervision of BHEL engineers, contractor will be responsible for the quality of the workmanship and shall guarantee the work done for a period of 12 months from the date of start of guarantee period, as certified by the engineer for good workmanship and shall rectify free of cost all defects due to faulty erection. In case contractor 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 & cost without prejudice to any other rights and recover the same from SD/ other dues.
43.2	The guarantee period will commence from the date of handing over of the unit to customer or six months after completion of full load operation of the unit, whichever is earlier, provided all erection, testing and commissioning works are completed in all respect for the unit .
43.3	All other provision shall be as per GCC.
<b>44.0</b>	<b>RECONCILIATION OF BHEL ISSUED MATERIALS</b>
44.1	The contractor shall submit a reconciliation statement of BHEL issued materials along with RA bill.
44.2	At the time of submission of bills, the contractor shall properly account for the material issued to them as specified herein to the satisfaction of BHEL certifying that

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	the balance material are available with contractor's custody at site.
44.3	The approved drawings/ bar bending schedules are to be considered for the purpose of reconciliation of materials.
<b>45.0</b>	<b>OTHER TERMS</b>
45.1	While bidder's scope include deployment of all resources, like T&P, materials, consumables, manpower including supervision etc for proper completion of the subject 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, bidder may associate agencies for deployment of skilled/ unskilled manpower only for site execution. Bidder should arrange all resources, like T&P, materials, consumables, supervision etc directly for the subject job.
45.2	All other term & conditions of this specification, not mentioned above shall be governed by the pertinent provisions of GCC, Volume-IB.

**ANNEXURE-I**  
**(LIST OF T&Ps TO BE PROVIDED BY CONTRACTOR)**

Bidder may note that following list is not exhaustive & given for guidance purpose. The bidder may have to deploy additional T&Ps not covered in this list at their own cost for proper execution of job.

SL NO	ITEM	QUANTITY
1.0	Crane of required capacity for lifting of the Silencers	AS REQUIRED
2.0	18 T Hydra/25 T Crawler Crane or above capacity as required	As per requirement
3.0	HYDRA CRANE (12T/14T)	AS REQUIRED
4.0	TRACTOR-TRAILOR	-DO-
5.0	ELECTRICAL WINCH (2T/5T/10T)	-DO-
6.0	HYDRAULIC TEST PUMP (0-16 KG/SQCM)	DO
7.0	RESISTANCE HEATING MACHINES WITH ACCESSORIES	12 NOS
8.0	WELDING GENERATOR, K-320	-DO-
9.0	WELDING TRANSFORMER (300/ 450 AMP)	- DO -
10.0	WELDING RECTIFIER	- DO -
11.0	INVERTER TYPE RECTIFIER	- DO -
12.0	HYDRAULIC PIPE BENDING M/C	AS REQUIRED
13.0	CHAIN PULLEY BLOCK (5T, 3T, 2T)	- DO -
14.0	PULL LIFT (6T, 5T, 3T, 1.5T)	- DO -
15.0	HYDRAULIC JACK (20T, 10T, 5T)	- DO -
16.0	SINGLE SHEAVE SNATCH PULLEY (10T, 5T)	- DO -
17.0	D SHAKLES (20T, 10T, 5T)	- DO -
18.0	TURN BUCKLES (3T, 5T, 8T, 10T, 15T, 20T)	- DO -
19.0	TIG WELDING SET	- DO -
20.0	OXYGEN REGULATOR	- DO -
21.0	ACETYLENE REGULATOR	- DO -
22.0	CUTOGEN 5	- DO -
23.0	OXYGEN HOSE (10 MM)	- DO -
24.0	ACETYLENE HOSE (10 MM)	- DO -
25.0	ELECTRODE DRYING OVEN	- DO -
26.0	PORTABLE ELECTRODE DRYING OVEN	- DO -
27.0	COPPER WELDING CABLE (600 AMP, 400 AMP)	- DO -
28.0	ALUMINIUM CABLE (600 AMP, 400 AMP)	- DO -
29.0	THERMAL-CHALK (100 DEG C TO 800 DEG C)	- DO -
30.0	ELECTRODE BAKING OVEN	- DO -
31.0	THEODOLITE (1 SEC ACCURACY)	- DO -
32.0	SPIRIT LEVEL (12 INCH, 0.1 MM ACCURACY)	- DO -
33.0	MAGNETIC PARTICLE TESTING M/C	- DO -
34.0	HARDNESS TESTER M/C	- DO -
35.0	DRILLING M/C OF DIFFERENT SIZES	- DO -
36.0	GRINDING M/C OF DIFFERENT SIZES	- DO -
37.0	TRIP TORQUE WRENCH	- DO -
38.0	ALUMINIUM TELESCOPIC LADDER	- DO -
39.0	MANILA ROPES OF DIFFERENT SIZES	- DO -
40.0	STEEL WIRE ROPES OF DIFFERENT SIZES	- DO -
41.0	DYE PENETRANT TEST KIT	- DO -
42.0	RECORDABLE UT MACHINE	1 NO
43.0	PMI MACHINE	1 NO
44.0	RT SOURCE WITH OPERATOR/ARRANGEMENT	2 NOS
45.0	NON CONTACT TEMPERATURE GAUGE	2 NOS
46.0	DEWATERING PUMP (5 HP)	-DO -
47.0	AIR COMPRESSOR	1 NO
48.0	DG SET (FOR WELDING IN AREAS IN CASE OF NON AVAILABILITY OF ELECTRCIAL POWER)	As Required

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49.0	DG SET (FOR P-91 WELDING)	As Required
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**MEASURING AND MONITORING DEVICES (MMD):**

AS PER REQUIREMENT TO BE FINALIZED AT SITE.

**NOTE :**

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

**ANNEXURE-II****LIST OF CONSUMABLES TO BE PROVIDED BY THE CONTRACTOR WITHIN QUOTED RATES FOR 660 MW UNIT.**

SI.No.	Description	Quantity	Remarks
01.	Gases like O2, CO2, Argon, D/A, LPG and others as per requirement (FOR CONSTRUCTION PURPOSE AND NOT FOR COMMISSIONING USES )"	As required	Sufficient stock has been maintained.
02.	Filler wire for both SS and others as required	As required	
03.	Ordinary Portland Cement	As required	
04	Grouting materials/ Grouting cements	As required	
07	Lapping compound	--do--	For valves servicing
09	Hydraulic oil	--do--	For uses in different equipment and hydraulic jacks, pumps and other applications
10	Paints for preservation, touch up painting, normal and final cum finish painting	--do--	For painting
11	Different types of electrical lamps, tube lights , halogen lamps, sodium vapour lamps with fixtures	--do--	As required
12	Electrodes / Filler wires as per requirement	--do--	--do--
13	Test pieces for welders test like plates, pipes etc.	--do--	--do--
14	Brazing Rods	--do--	--do--
15	Soldering consumables	--do--	--do--
16	Consumables for welding and NDTs	--do--	--do--
17	Thermal chalks of different ranges	--do--	--do--
18	Consumables for Pre-heating, Stress Relieving, Post heating etc.	--do--	--do--
19	Consumables for arranging welders' qualifying works	--do--	--do--
20	Welders accessories	--do--	--do--
22	Services for effluent disposal	--do--	--do--
23	Rustolene	--do--	--do--
24	Kerosene	--do--	--do--
25	CTC, Acetone as per requirement	--do--	--do--
26	Petrol	--do--	--do--
27	Diesel	--do--	--do--
30	Red Lead	--do--	--do--
31	Hemp Fibre	--do--	--do--
32	Asbestos Rope (Pure) 2,4,6,8,10, 12,25 mm and other sizes as required	--do--	--do--
33	Insulation Adhesive Tape 20 mm Width and other sizes as per requirement	--do--	--do--

34	Emery Tape as per requirement	--do--	--do--
35	Hack-shaw of different sizes as per requirement	--do--	--do--
36	Emery Paper Gr. 60, 80, 100, 120, 150 , 220 and others as per requirement	--do--	--do--
37	Asbestos Cloth in Wax Paper 1X1 M –as required	--do--	--do--
38	PACKING BLACK PAPER 1X1 M	--do--	--do--
39	ADHESIVE TAPE 0.3 mm THICKNESS-as required	--do--	--do--
40	WHITE COTTON TAPE 12 mm WIDTH-as required	--do--	--do--
41	GRAPHITE POWDER FINE QUALITY – as required	--do--	--do--
42	GRAPHITE FLAKES as required	--do--	--do--
43	RAW LINESEED OIL as required	--do--	--do--
44	DOUBLE BOILED LINSEED OIL AS REQUIRED	--do--	--do--
45	CYLINDER OIL AS REQUIRED	--do--	--do--
46	ENAMEL PAINT ( OF REQUIRED COLOUR) AS REQUIRED	--do--	--do--
47	MOBILE VELOCITE OIL 'S' AS REQUIRED	--do--	--do--
48	TURPENTINE OIL AS REQUIRED	--do--	--do--
49	TRICHLORO ETHYLENE AS REQUIRED	--do--	--do--
50	METHYLATED SPIRIT AS REQUIRED	--do--	--do--
51	MOBILOX GREASE 2 (IOC) AS REQUIRED	--do--	--do--
52	SERVOGEM –2,3 GREASE AS PER REQUIREMENT	--do--	--do--
53	OTHER SPECIAL GREASE AS PER REQUIREMENT	--do--	--do--
54	RUST BAN (ESSO) AS PER REQUIREMENT	--do--	--do--
55	MOLYKOTE PASTE AS PER REQUIREMENT	--do--	--do--
56	BIRKOSITE AS PER REQUIREMENT	--do--	--do--
57	WASHING SODA AND SOAP AS PER REQUIREMENT	--do--	--do--
58	COTTON WASTE AS PER REQUIREMENT	--do--	--do--
59	CLEAN RAGS AS PER REQUIREMENT	--do--	--do--
60	WHITE CLOTH (CEARSE) AND USED CLOTHS AS REQUIRED	--do--	--do--
61	SACK CLOTH AS PER REQUIREMNT	--do--	--do--
62	JELLEY SOAP OR BAR SOAP AS PER REQUIREMENT	--do--	--do--
63	EMERY CLOTH 100 mm WIDTH ROLL GR. 60, 100, 120, 150,220 AND OTHERS AS PER REQUIREMENT	--do--	--do--
64	SAND PAPERS GR. 60, 80 ,120 AND OTHER AS PER REQUIREMENT	--do--	--do--

65	EMERY PASTE (VALVE LAPPING COMPOUND) GR. 60, 80, 100 & 220 AND OTHERS AS PER REQUIREMENT.	--do--	--do--
66	GRINDING WHEELS, STONES OF DIFFERENT SIZES AS PER REQUIREMENT	--do--	--do--
67	WELDING ELECTRODES (CARBON STEEL,M.S., ALLOY STEEL AND FILLER WIRES, STAINLESS STEEL BOTH FERROUS AND NON FERROUS) EXCEPTING THOSE SUPPLIED BY BHEL AS PER RELEVANT ANNEXURE) AS PER REQUIREMENT	--do--	--do--
68	SOLDERING STICK( LEAD -TIN ALLOY) AS PER REQUIREMENT	--do--	--do--
69	SOLDERING WIRE (SILVER ALLOY) AS PER REQUIREMENT	--do--	--do--
70	SOLDERING FLUX (SILVER ALLOY) AS PER REQUIREMENT	--do--	--do--
71	BRZING FLUX/BORAX AS REQUIRED	--do--	--do--
72	SOLDERING FLUX (LEAD-TIN ALLOY) AS REQUIRED	--do--	--do--
73	MS GAS WELDING WIRE AS REQUIRED	--do--	--do--
74	DP TEST KIT WITH MAGNIFYING GLASS AS REQUIRED	--do--	--do--
75	IRON AND STEEL SECTIONS AS REQUIRED	--do--	FOR ARRANGING SCAFFOLDING AND FIXTURES ETC.
76	MS BOLTS AND NUTS WITH TWO PLAIN WASHERS AND ONE SPRING WASHER AS REQUIRED.	--do--	As required
77	MS ANGLES ASSORTED AS REQUIRED	--do--	--do--
78	MS CHANNELS ASSORTED AS REQUIRED	--do--	--do--
79	ROUNDS ,FLATS,MS PLATES ASSORTED AS REQUIRED	--do--	--do--
80	ENGINEERS BLUE / PRUSSIAN BLUE AS REQUIRED	--do--	--do--
81	CHALK PIECES- WHITE,COLOUR AND POWDER AS REQUIRED	--do--	--do--
82	TEINE AS REQUIRED	--do--	--do--
83	BATTERY CELLS 1.5 VOLTS TORCH LIGHT CELLS,PENCIL BATTERY ETC.AS REQUIRED	--do--	--do--
84	RED AND BLUE PENCILS AS REQUIRED	--do--	--do--
85	GALVANISED STEEL WIRE 1mm DIA AND OTHER SIZES AS REQUIRED	--do--	--do--
86	FLANNEL CLOTH 1M WIDTH AS PER REQUIREMENT	--do--	--do--
87	SPLIT PINS 2mm TO 6 mm AND OTHER SIZES AS PER REQUIREMENT	--do--	--do--
88	WOOD SCREWS 3/4" TO 3" AS PER	--do--	--do--

	REQUIREMENT		
89	LEAD SHEET 3 mm AND 4 mm THICKNESS AS PER REQUIREMENT	--do--	--do--
90	TARPAULINE 3X3 M AND 5X5 M AND 10X5 M AND OTHER SIZES AS PER REQUIREMENT	--do--	--do--
91	VULCANISED RUBBER FIBRE 0.5 MX0.5 MX15 mm THICKNESS AS PER REQUIREMENT	--do--	--do--
92	PLYWOOD 1M X 2M X 3mm AND OTHER SIZES AS PER REQUIREMENT	--do--	--do--
93	NAILS-WIRE 1' TO 3' AS PER REQUIREMENT	--do--	--do--
94	CANDLES MEDIUM SIZE AS PER REQUIREMENT	--do--	--do--
95	PORTABLE SWITCH BOARD CONTAINING 15 AMPS TP METAL CLAD SWITCH WITH FUSE 3X15 AMPS, SWITCHES AND 3 PLUG SOCKETS AS PER REQUIREMENT	--do--	--do--
96	WOODEN PLANK PULLEYS AS REQUIRED	--do--	--do--
97	ANY OTHER ITEMS AS REQUIRED TO COMPLETE THE JOBS	--do--	--do--

All lubricants and chemicals required for testing, chemical cleaning, acid cleaning, oil/chemical/gas flushing required for testing, pre-commissioning & commissioning up to trial operation of equipments/unit will be provided FREE OF COST by BHEL. Nitrogen, Carbon-dioxide and Hydrogen gas for purging and filling in Turbo-generator will also be supplied FREE OF COST by BHEL

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ANNEXURE-III

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

SL. NO.	DESCRIPTION & CAPACITY OF T&P	QUANTITY	PURPOSE
01	SPECIAL T&Ps SUPPLIED BY BHEL/ MANUFACTURING UNITS **	01	FOR ERECTION, COMMISSIONING WORK.
02	HYDRO-TEST PUMP OF CAPACITY OF 400 KG/SQ.CM OR ABOVE	AS REQUIRED	FOR HYDRO-TEST
03	LOADS LIKE PLATES, BLOCKS ETC.	AS REQUIRED	FOR LOAD TESTING OF DIFFERENT HOISTS AND LIFTING EQUIPMENT. HOWEVER THE CONTRACTOR HAS TO ARRANGE FOR REQUIRED SHIFTING AND HANDLING ARRANGEMENT ON THEIR OWN FOR ISSUING FROM BHEL/CUSTOMER'S STORE AND RETURNING TO BHEL/CUSTOMER'S STORE.
04	Chemical cleaning motor-pump sets alongwith	AS REQUIRED	
05	INDUCTION HEATING EQUIPMENT WITH ALL REQUIRED SPARES, CONSUMABLES AND ACCESSORIES LIKE ANNEALING AND POWER CABLES FOR P-91 PIPE WELDING. POWER RATING: 75 KW (MIN.),	AS REQUIRED	For welding of P-91 piping joints

**NOTE:**

\*\* The items issued by BHEL shall be used by the contractor for erection and commissioning works and has to be returned to BHEL after job completion in good working condition.