ONGC TRIPURA POWER COMPANY LIMITED

TECHNICAL SPECIFICATIONS

FOR

OPERATION & MAINTENANCE

2 X 363.3 MW

GAS BASED COMBINED CYCLE POWER PLANT,

PALATANA, UDAIPUR, TRIPURA

TECHNICAL SPECIFICATION

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1.0 SCOPE OF SERVICES

1.1 It is clearly understood by the parties that in respect of Services to be provided by O&M Operator under the Contract, responsibility of Owner shall be limited to scheduled maintenance of Gas Turbine under LTSA, furnish Spare Parts for the Plant, procure Owner's insurance and obtain Permits as detailed elsewhere in the Contract and O&M Operator shall be responsible for providing all other Services (as defined under the Contract) including supply of all the material (except Spare Parts) hereinafter referred as "**Consumables**" .

For the sake of clarity, the O&M Operator agrees and acknowledges that Consumables include chemicals, gases , consumables, oils, lubricants, filters (except gas turbine inlet air filter), electrical accessories, construction material and other materials (except Spare Parts), required from time to time for the operation, maintenance, inspection, testing and repair of the Plant, which will be consumed during operation and maintenance of Plant (including inspection, testing and repair) and will then need to be replenished, starting from start of Operational Phase till expiry of the Term in accordance with the terms and conditions specified in the Contract and this Technical Specification.

1.2 In this Technical Specification, capitalized terms used but not defined shall have the meaning assigned to them under the operations and maintenance contract dated [●] (the "**Contract**").

2.0 GENERAL OBLIGATION OF THE O&M OPERATOR

2.1 The O&M Operator shall obtain, at its expense, all Permits required to be obtained by the O&M Operator, except those required to be obtained by the Owner, to allow it to carry on its business and provide the Services under the Contract.

2.2 Pursuant to the Contract, the Owner is contracting for the Services of the O&M Operator, as an independent contractor, to (a) operate and maintain the Plant on behalf of the Owner, (b) supply Consumables required to operate and maintain the Plant, (c) generate electricity from the Plant on behalf of Owner (d) schedule, coordinate and handle deliveries of fuel gas and perform all duties and responsibilities (other than payment responsibilities) of the Owner and (e) otherwise operate and maintain and administer the Plant in accordance with the Contract. The O&M Operator will operate and maintain the Plant and supply Consumables all the times and in the manner specified in and pursuant to the Contract and perform other duties as are set forth in the Contract. Without limiting the generality of the foregoing, Services to be performed by the O&M Operator hereunder shall include acts, activities and other matters for effective operation and maintenance of the Plant. O&M Operator will also perform energy audits, safety audits and plant performance audits annually for the improvement in the performance of the Plant at its own cost.

2.3 Subject to Applicable Laws, provisions of the Contract and Prudent Utility Practices, O&M Operator shall operate the Plant in accordance with Dispatch Instructions of Owner.

2.4 The O&M Operator shall abide by the terms, conditions and requirements for the operation, maintenance, inspection, testing and repair of the Plant set forth in the Contract. Further, O&M Operator shall co-operate in good faith with and assist the Owner in administering and complying with Project Agreements and

maximizing the benefits to be derived by the Owner there under as specified in Clause 19.0 of the Contract.

2.5 The O&M Operator will provide Services for technical support and root cause analysis of unscheduled outage and review, analysis and interpretation of Plant operating parameters, improvement in MIS, improvement in planning, suggestions for improvement in performance and suggestions for improvement in efficiency. O&M Operator will also provide Services for preparation and review of Annual Operating Plan and Budget, O&M Plan and Procedures, Inventory Management and Procurement Procedure during the Term of the Contract.

2.6 The O&M Operator shall notify the Owner promptly upon becoming aware of any warranty claim which may be asserted against the Existing O&M Contractor during the 12 (twelve) months period commencing from the Operational Phase in relation to the Services provided by such Existing O&M Contractor for the operation and maintenance of the Plant. However, this provision will not dilute in any manner the obligation of the O&M Contractor under the Contract to provide the Services required for operating and maintaining the Plant.

3.0 STANDARD OF PERFORMANCE OF SERVICES

3.1 The O&M Operator shall perform the Services required under the Contract including those set forth in Clause 4.0 of this Technical Specification in a prudent, efficient and careful manner and in accordance with:

3.1.1 the provisions of the Contract;

3.1.2 the Prudent Utility Practices;

3.1.3 the Annual Operating Plan and Budget and the policies, procedures and other plans and budgets to be established by the Owner during the Term such as the Inventory Management and Procurement Plan pursuant to the Contract;

3.1.4 the O&M Plan and Procedures for the Plant to be developed by O&M Operator and to be approved by Owner as described in Clause 4.5. of this Technical Specification;

3.1.5 the O&M Manuals provided by OEM and/or EPC Contractor;

3.1.6 the recommendations in relation to Plant, equipment, materials or other work provided by the EPC Contractor;

3.1.7 all Applicable Laws, Permits, clearances and Governmental Authorizations in relation to O&M Operator's obligations under the Contract;

3.1.8 applicable Dispatch Instructions;

3.1.9 the requirement of any System Operator;

3.1.10 the Project Agreements specified in Clause 19.0 of the Contract; and

3.1.11 all insurance policies specified in Clause 13.0 of the Contract.

3.2 The Services shall be performed:

3.2.1 so as to achieve or improve upon guaranteed performance parameters defined in Clause 10.0 of the Contract;

3.2.2 so as to minimize Scheduled Outages and not to cause any outage except for Scheduled Outages;

3.2.3 so as to assist in achieving the most efficient heat rate and efficiency of the Plant and to minimize the overall operating and maintenance costs (including Fuel and inventory costs) of the Plant;

3.2.4 in a manner consistent with insurance policies maintained either by the O&M Operator or Owner in relation to the Plant and so as not to vitiate or annul any cover afforded by such insurance policies; and

3.2.5 so as to optimize useful life of the Plant and minimize cost of generation.

3.3 In the event that any of the standards and requirements specified under Clause 3.1 and Clause 3.2 above or elsewhere in the Contract, for the performance of the Services by the O&M Operator hereunder require a higher level of performance or a greater duty of care or are otherwise more stringent, more restrictive or more onerous than other such standards and requirements, the more stringent, restrictive or onerous of the standards or requirements shall apply to the O&M Operator's performance of the Services.

4.0 SERVICES TO BE PROVIDED BY O&M OPERATOR DURING TERM OF CONTRACT

4.1 In furtherance of and without limiting the obligations and responsibilities of the O&M Operator specified in Clause 3.0 above and elsewhere in the Contract, the O&M Operator shall, at all times commencing from the Effective Date and continuing through the Term and in accordance with the provisions of the Contract, perform the services specified hereunder (the "**Services**").

For the convenience only, Services have been categorized as services during the Takeover Phase and services during the Operational Phase. However, any Services envisaged under the Contract to be provided by O&M Operator, irrespective of their categorization, shall be provided as and when required.

4.2 SERVICES DURING TAKEOVER PHASE

4.2.1 During the Takeover Phase as defined under the Contract, the O&M Operator shall perform the Services including but not limited to those specified in the Clause 4.2 and its sub-clauses of this Technical Specification and the Contract. Takeover Phase is the period commencing from the Effective Date and ending on 24:00 hrs on 31st December 2020.

4.2.2 O&M Operator Staff

4.2.2.1 Provide written job descriptions in reasonable detail for each category of O&M Operator Staff along with their name, CV, etc. for Owner's approval within 30 (thirty) days from Effective Date.

4.2.2.2 Deploy trained and experienced O&M Operator Staff required for the performance of the Services during Takeover Phase as per Clause 5.0 of the Contract.

4.2.2.3 Deploy trained and experienced O&M Operator Staff required for the performance of the Services during Operational Phase as per Clause 5.0 of the Contract.

4.2.3 **License, Permits and Clearance**

4.2.3.1 Obtain Permits, clearances and licenses required to be obtained and maintained by the O&M Operator pursuant to Clause 42.0 of the Contract for providing Services under the Contract and submit copy of all such Permits, clearances and licenses to the Owner within 30 (thirty) days from the Effective Date.

4.2.4 **Insurance Policies**

4.2.4.1 Procure insurance policies required to be procured and maintained by the O&M Operator as specified in Clause 13.0 of the Contract and submit copy of all such insurance policies to the Owner within 30 (thirty) days from the Effective Date.

4.2.5 **Spare Parts, Consumables, Tools & Tackles**

4.2.5.1 Prepare jointly with the Existing O&M Contractor an updated inventory list of all chemicals, Consumables, oil, lubricants, Spare Parts, fixtures, special tools and tackles and equipment forming a part of the Plant or being the subject of the Services, which are the property of the Owner.

4.2.5.2 Take over from Existing O&M Contractor, in consultation with the Owner, all items of chemicals, Consumables, oil, lubricants, Spare Parts, special tools and tackles, equipment and any other material belonging to Owner on as is basis as shown in the updated inventory list.

4.2.5.3 Procure, supply, transport from supplier's works/warehouse, obtain marine insurance, receive, inspect, store, preserve, use and manage Consumables required for uninterrupted and trouble free operation and maintenance of the Plant during Term of the Contract.

4.2.5.4 Ensure availability of Consumables at Plant sufficiently in advance of start of Operational Phase, but no later than 2 (two) weeks prior to the start of Operational Phase.

4.2.5.5 Procure all Consumables as per specification provided by OEM/EPC Contractor and preferably from source recommended by OEM/EPC Contractor (if any) and in each case approved by Owner.

4.2.5.6 Deploy tools & tackles, appliances, material handling equipment, technician's tools box, instruments etc as specified in Clause 28.0 of the Contract.

4.2.6 **Drawings, Documents, Manuals and Procedures**

4.2.6.1 Review, modify, update and prepare O&M Plan & Procedure including maintenance plan consistent with standards of performance specified in Clause 3.0 of this Technical Specification and as specified in Clause 4.5 of Technical Specification and submit the same to Owner for approval within 30 (thirty) days from the Effective Date.

4.2.6.2 Review, modify, update and prepare Inventory Management and Procurement Procedure for Spare Parts, chemicals, consumables, oil, lubricants and other

materials as specified in Clause 27.0 of the Contract and submit the same to the Owner for approval within 30 (thirty) days from the Effective Date.

4.2.6.3 Submit Annual Operating Plan and Budget for first year of operation within 30 (thirty) days from the Effective Date. Procedure to be followed for adopting / approval of Annual Operating Plan & Budget is specified in Clause 6.0 of this Technical Specification.

4.2.6.4 Prepare jointly with the Existing O&M Contractor an updated inventory list of and takeover, in consultation with the Owner, all drawings, documents, O&M Manuals, O&M Plan and Procedures, logs, reports, records, etc. of the Plant including those developed by the Existing O&M Contractor while performing Services under the Contract.

4.2.7 **Plant Maintenance Module and Materials Management Module under SAP**

4.2.7.1 All the functionality of plant maintenance module of SAP ("**Plant Maintenance Module**") and material management module of SAP ("**Materials Management Module**") assigned by Owner including but not limited to the following shall be performed by the O&M Operator:

4.2.7.2 Work in Plant Maintenance Module of SAP will include:

a. creation of maintenance notification;

b. release of maintenance notification;

c. closure of maintenance notification;

d. creation of maintenance work order;

e. release of maintenance work order;

f. closure of maintenance work order;

g. creation of permit to work (PTW);

h. release of permit to work;

i. closure of permit to work;

j. creation of maintenance plan;

k. release of maintenance plan;

l. creation of permit to work plan;

m. release of permit to work plan;

n. reservation of materials for maintenance; and

o. reports generation – daily/weekly/monthly/quarterly/bi-annually/annually.

4.2.7.3 Work in Materials Management Module of SAP:

a. receipt of materials;

b. issue of materials;

c. return of materials;

d. inspection of materials;

e. planning of materials requirement;

f. reports generation – daily/weekly/monthly/quarterly/bi-annually/annually

Above lists in relation work under the Plant Management Module and the Materials Management Module are indicative and any other work in SAP required to be performed for operation and maintenance of Plant shall be in the scope of O&M Operator.

4.2.7.4 Populate Plant Maintenance Module of SAP with data of all equipment, special tools and tackles and spares. O&M Operator to mandatorily maintain equipment history in SAP (MTTR and MTBF).

4.2.7.5 Prepare work order for maintenance, reservation of materials for maintenance, issue permit to work, update status, maintenance history, etc.

4.2.7.6 All the functional requirements of Plant Maintenance Module and inventory management section of Materials Management Module.

4.2.8 **Joint Operation & Maintenance of the Plant**

4.2.8.1 In order to facilitate smooth transition of operation and maintenance activities from Existing O&M Contractor to the O&M Operator, during the Takeover Phase, for a period of 15 (fifteen) days commencing from 01 December 2020, the Existing O&M Contractor shall operate and maintain the plant and the O&M Operator shall observe the operation and maintenance and for next 15 (fifteen) days of the Takeover Phase, the O&M Operator shall operate and maintain the Plant under the observation of the Existing O&M Contractor.

4.2.9 On Owner's request participate in discussions with other Parties including, Lenders, consultants, insurers, advisors, Promoters, and Governmental Authorities etc.

4.2.10 Provide legal, payroll, insurance, accounting and administrative support services with respect to O&M Operator's Staff.

4.2.11 Prepare handing over/taking over documents and get it signed by authorized representative of O&M Operator, Existing O&M Contractor and the Owner.

4.3 **SERVICES DURING OPERATIONAL PHASE OF THE CONTRACT**

4.3.1 During the Operational Phase as defined under the Contract, the O&M Operator shall perform the Services including but not limited to those specified in the Clause 4.3 of this Technical Specification. Operational Phase is the period starting from 00:00 hrs of 1st January 2021 and shall continue till the expiry of Term or till termination date in case of early termination of the Contract as per the provision of the Contract.

4.3.2 Provide Services specified in Clause 4.2 above.

4.3.3 **Operation & Maintenance of the Plant**

4.3.3.1 Plan, manage, operate, maintain, carryout tests and repairs of the Plant on a 24 (twenty four) hours per day, 7 (seven) days per week and 365 (three hundred sixty five) days per year basis including all auxiliaries and interconnecting equipment of the Plant ensuring achievement of guaranteed performance parameters.

4.3.3.2 Locally operate RWIS located on the bank of Gumti River. No remote operation of this system is allowed. Two shift operations are required at river water pump house to maintain sufficient reservoir level. However, there will be certain period in the year, when round the clock operation of river water pump house operation will be required. O&M Operator shall ensure continuous manning of this pump house during operation hours. Maintenance team will undertake daily/routine/corrective maintenance of this pump house also apart from other scheduled/preventive/predictive maintenance including periodic dredging of the intake catchment area at river, construction of temporary seasonal dam at river time to time, temporary pump/piping installation at river for pumping water to RWIS time to time to fulfill plant water requirement.

4.3.3.3 Plan, schedule, carryout and manage day-to-day operation and perform daily, routine, preventive, corrective, predictive and breakdown inspection, testing (non destructive testing), maintenance and repair of all Plant systems, equipment, components, etc., in accordance with the Contract, Prudent Utility Practice, Project Agreements, Dispatch Instructions, O&M Manuals, recommendations of EPC Contractor/OEM, Applicable Laws, Permits, and approved O&M Plan and Procedure so as to ensure long term safe and reliable operation and maintenance of Plant.

4.3.3.4 Routine preventive maintenance activities shall include, without limitation:

4.3.3.4.1 Lubrication checks;

4.3.3.4.2 Cleaning/flushing;

4.3.3.4.3 Preservation;

4.3.3.4.4 Fluid changes and replacement;

4.3.3.4.5 Visual inspection;

4.3.3.4.6 Operational monitoring;

4.3.3.4.7 Vibration analysis;

4.3.3.4.8 Chemical analysis (water, steam, oil and fuel testing);

4.3.3.4.9 Trend analysis;

4.3.3.4.10 Calibration;

4.3.3.4.11 Measurements;

4.3.3.4.12 Adjustments;

4.3.3.4.13 Hydrostatic tests;

4.3.3.4.14 Oil analysis;

4.3.3.4.15 Replacement of wear/sacrificial parts; and

4.3.3.4.16 Resistance testing.

4.3.3.5 Plan, execute and manage routine corrective maintenance activities to troubleshoot, inspect and repair the equipment upon identification and detection of certain conditions, including without limitation.

4.3.3.5.1 ***Physical Fault Condition such as:***

4.3.3.5.1.1 Blocked/stopped flow;

4.3.3.5.1.2 Fractures/break/breaches;

4.3.3.5.1.3 Cracks;

4.3.3.5.1.4 Distortion/displacement; and

4.3.3.5.1.5 Corrosion/discoloration.

4.3.3.5.2 ***Out of specification conditions such as:***

4.3.3.5.2.1 High/low flow, pressure, temperature or chemistry;

4.3.3.5.2.2 Off voltage;

4.3.3.5.2.3 Out of limits/adjustments;

4.3.3.5.2.4 Erratic output;

4.3.3.5.2.5 Intermittent/spurious operation;

4.3.3.5.2.6 Failure to control/hold;

4.3.3.5.2.7 High/low output; and

4.3.3.5.2.8 Improper timing.

4.3.3.5.3 ***Demand fault condition such as failure to:***

4.3.3.5.3.1 Start/run/operate;

4.3.3.5.3.2 Stop;

4.3.3.5.3.3 Open;

4.3.3.5.3.4 Close; and

4.3.3.5.3.5 Move/release/respond.

4.3.3.5.4 ***Abnormal characteristics such as:***

4.3.3.5.4.1 Overheating;

4.3.3.5.4.2 Noise;

4.3.3.5.4.3 Vibration;

4.3.3.5.4.4 Chatter; and

4.3.3.5.4.5 False response.

4.3.3.5.5 ***Leakage conditions such as:***

4.3.3.5.5.1 Leakage to surrounding environment; and

4.3.3.5.5.2 Leakage past seats/stems/packing/seals.

4.3.3.5.6 Corrective maintenance not requiring equipment shutdown shall be performed as soon as possible in order of priority. Corrective maintenance requiring equipment shutdown shall be performed when equipment is removed from service.

4.3.3.5.7 Above mentioned list of activities for preventive maintenance and corrective maintenance is indicative only. O&M Operator shall carryout all preventive maintenance activities and corrective maintenance activities which are required as per standard of performance described in Clause 3.0 above.

4.3.3.6 Perform preventive and corrective maintenance activities on a system-by-system basis on all the equipment in the Plant.

4.3.3.7 Plan, carryout and manage major inspections, overhauls and repair of Plant systems and equipment under the supervision of OEM.

4.3.3.8 Perform all unplanned, breakdown inspection, testing (including non destructive testing), and repairs of the Plant whenever required.

4.3.3.9 Plan and perform statutory annual maintenance of HRSG (Boiler).

4.3.3.10 Take all corrective actions whenever required consistent with Prudent Utility Practice and approved by Owner in order to achieve the Rated Capacity (or above) during each Time Block.

4.3.3.11 Perform Plant capacity test as and when required by power purchaser, System Operator or any other Government Agency or by Owner or required as per Project Agreements or any other agreement to which Owner is a party and provide the Owner with written reports on the results thereof.

4.3.3.12 Notify the Owner by telephone as soon as reasonably practicable, and in any case, within 8 (eight) hours and in writing within 24 (twenty-four) hours of discovery of any unusual adverse operating condition or characteristic which cannot be immediately corrected by the O&M Operator.

4.3.3.13 Notify the Owner and act as provided in Clause 43.0 of the Contract in the Emergency Event.

4.3.3.14 Take action as provided in Clause 43.0 of the Contract in the event of extraordinary circumstances.

4.3.3.15 Be responsible, for the handling, management and disposal of all effluent and hazardous wastes generated in the Plant and comply with all directives in connection therewith. Hazardous Wastes including air filters, oily waste, fuel condensate shall be disposed off / transported by O&M Operator through certified hazardous waste recycler only to outside Plant boundary.

4.3.3.16 Operate the Plant in accordance with the Dispatch Instructions of Owner/NERLDC**.**

4.3.3.17 Monitor and keep record, in accordance with the procedures established pursuant to the Contract, the quality and quantity of water drawn from Gomti River, Fuel requisitioned by O&M Operator and Fuel delivered by Fuel Supplier.

4.3.3.18 Prepare, update and maintain on a daily basis a work order system and tag-out documents in the SAP including in relation to the Plant Maintenance Module and Materials Management Module.

4.3.3.19 Operate and maintain metering equipment and perform inspections, calibrations (including calibration/testing of all electrical metering equipment, all operational parameters measuring instruments, all fuel metering equipment and all water metering equipment (including those installed in river water intake system near river bank) for which the Owner is responsible under Project Agreements or as may be required by Prudent Utility Practices or by applicable laws or the Contract. Such calibration test/witnessing (in-house as well as by accredited third party agency) is also included in O&M Operator's scope.

4.3.3.20 Arranging radiography test for welding joint in high pressure system or at any other system where it is required to ensure the quality of welding.

4.3.3.21 Carrying out ultrasonography test for thickness measurement of pipes and tubes, baroscopic inspection.

4.3.3.22 Condition monitoring of Plant equipment and vibration analysis, etc.

4.3.3.23 Monitoring the quality by performing chemical, physical, and visual analysis and arranging cleaning and purification (online and offline) of transformer oils, jacking oil, cooling oils, control oils, lube oil, etc. It is clarified that NAS value of oils shall be checked every monthly.

4.3.3.24 Control outages, both planned and unplanned, in a manner that is consistent with lowest cost, the obligations of the Owner, best utilization of labour and parts, and maximization of productivity by using detailed and integrated plans and schedules and resource management.

4.3.3.25 Obtain prior approval of System Operator/power purchaser/Central Electricity Authority through Owner for scheduled outage.

4.3.3.26 Maintain Plant performance levels by using routine system and component performance testing.

4.3.3.27 Surface preparation and painting, as per procedure to be approved by the Owner, of all the buildings, structures, piping, equipment, HRSG and its auxiliaries, instruments etc. whenever required but at least once during the Term. Primer and finish coat of paints shall be applied only after surface preparation is complete and the Owner has given clearance for application of

primer and finish paint. O&M Operator shall submit painting schedule for complete scope within ninety (90) days of the Effective Date.

4.3.3.28 Operation, Maintenance and repair of air conditioning system, water supply system (including plumbing), sewerage system, rain water harvesting system along with O&M of deep bore well pumps and associated system, electrical system, lighting, fire protection system etc of all the area of the Plant including control & facility building, switchyard control room, Administration Building, Training Hostel, Training Centre, Security Hostel, Medical Centre, Canteen etc. is also included in O&M Operator's scope of services.

4.3.3.29 For clarity it is specified that maintenance and repair of CCTV system, plant lighting, watch towers, boundary wall including barbed wire fencing, security gate complex, road in the Plant including patrol road and Plant drainage system is also included in O&M Operator's scope of services. Further, operation, maintenance and repair of equipment and instruments in mechanical workshop, instrument lab, electrical lab, chemical lab and 2 (two) numbers fire tenders (including spares, consumables and service) is also to be carried out by O&M Operator. The equipment in mechanical workshop (radial drilling machine, lathe machine, milling machine, surface grinder etc.) shall be serviced by OEM at least once in a year. Fire tenders shall have trial run of at least 5 (five) KM in each shift.

4.3.3.30 Perform all the obligations of the Owner under the Project Agreements relating to the operation and maintenance of the Plant.

4.3.3.31 Declare the Plant capacity on 15 (fifteen) minutes/hourly/daily/weekly basis and as requested by power purchaser/NERLDC.

4.3.3.32 Ensure that operational goals and operating plans are consistent with approved Annual Operating Plan and Budget.

4.3.3.33 Ensure that Plant is operated and maintained in accordance with standard of performance defined in Clause 3.0 of this Technical Specification and in a safe, reliable, efficient and prudent manner.

4.3.3.34 Ensure that costs are controlled and managed in such a manner that they are consistent with approved Annual Operating Plan and Budget.

4.3.3.35 Perform certain tasks, duties, responsibilities and obligations assigned to Owner under the interconnection agreements, including, but not limited to, the following:

4.3.3.35.1 Perform routine surveillance of all equipment routinely used to communicate with the NERLDC;

4.3.3.35.2 Notify the NERLDC, through Owner, of any routine maintenance activities which will require clearance from System Operator;

4.3.3.35.3 Provide the NERLDC and power purchaser, through Owner, with all required information regarding the Plant availability;

4.3.3.35.4 Respond to Dispatch Instructions from NERLDC and power purchasers through Owner;

4.3.3.35.5 Monitor and adjust the reactive output of the generators to maintain transmission voltage levels within the capability of the generators in the Plant; and

4.3.3.35.6 Respond to and correct generator dynamic instability in accordance with instructions received from System Operator through Owner;

4.3.3.36 Perform such other tasks and services which Owner may reasonably request from time to time in connection with operation and maintenance of the Plant.

4.3.3.37 Operate the Plant in close consultation with NERLDC, power purchaser, Fuel Supplier, transmission company, etc.

4.3.3.38 Keep the Plant in good order and protect it from damage, premature deterioration, failure or malfunction.

4.3.3.39 Carry out energy audit, safety audit and plant performance audit every year and implement measures recommended in these audits for achieving highest standard of safety, and maximizing efficiency and capacity enhancement of the Plant. All these audits shall be performed by reputed organization accredited for performing such audits as per terms of reference prepared by O&M Operator and approved by Owner. Prior to finalization of each audit reports, detailed presentation on the findings and recommendations shall be made by the auditing agency to the Owner.

4.3.3.40 Constantly improve the following key performance indicator of the Plant:

4.3.3.40.1 Plant availability;

4.3.3.40.2 PLF;

4.3.3.40.3 Plant efficiency;

4.3.3.40.4 Equipment wise availability and efficiency;

4.3.3.40.5 Consumption of spares;

4.3.3.40.6 Shut down time for Unit and equipment; and

4.3.3.40.7 Number of times and quantum of power drawn from Grid.

4.3.3.41 Coordinate settings of all protective relays as required by power purchaser/NERLDC/NETC/transmission utility.

4.3.3.42 If any or all of the Annual Operating Plan and Budget is not agreed by the NERLDC, power purchaser or Central Electricity Authority, the Owner and O&M Operator shall meet (if necessary) in order to agree upon revised Annual Operating Plan and Budget.

4.3.3.43 To translate any notices, letter or any other communication received by the Owner from any Government Agency at the Plant in a language other than the English to English and provide the same to the Owner.

4.3.3.44 Perform Root Cause analysis (RCA) for every incident of equipment/system failures / Unit tripping etc. and submit preliminary report within 24 hours and detail report (RCA) within fourteen calendar days of such incident and implement

measures recommended in the RCA report approved by Owner for achieving highest standard of safety, and maximizing efficiency, availability and capacity enhancement of the Plant. All these measures shall be performed by the O&M Operator within mutually agreed timelines with approval from Owner.

4.3.3.45 Availability of maintenance team comprising of engineer, technician, helper and hydra operator in night shift to ensure uninterrupted jobs during overhauling of major equipment like turbines, generators, transformers, reactors, HRSG, pumps, valves , Motors, actuators etc.

4.3.3.46 Arrangement of outsourced services immediately but in no case later than 8 hours of incident for performing breakdown maintenance, leakage arresting, arresting valve passing etc..

4.3.4 **Services and Obligation of O&M Operator related to Gas Turbines and Auxiliaries**

4.3.4.1 Perform all the scope of services and obligations of the Owner (except supply of Spare Parts) under LTSA. Please refer to Annexure-1 of this Technical Specification for Owner's scope of services and obligation under LTSA to be performed by O&M Operator.

4.3.4.2 All the services described in Clause 4.3.4.1 shall be provided by O&M Operator for 2 (two) number Gas Turbine.

4.3.4.3 It is clarified that all such maintenance of Gas Turbine and auxiliaries which is not included in the scope of work of LTSA Contractor shall be performed by O&M Operator.

4.3.5 **Subcontracting**

4.3.5.1 Arrange and pay for specialist services, OEM supervision and OEM after sales services, etc. as provided in Clause 20.0 of the Contract.

4.3.5.2 Enter into annual maintenance contract as provided in Clause 20.0 of the Contract.

4.3.6 **O&M Operator's Staff**

4.3.6.1 Deploy experienced and trained staff in adequate number including replacement as per Clause 5.0 of the Contract to provide Services under the Contract. In no case the qualification and experience criteria required for any position shall be relaxed.

4.3.6.2 O&M Operator Staff shall possess knowledge of the Grid Code and provisions under ABT (availability based tariff) so as to optimize the Plant operation and dispatch including the UI (uninterrupted interchange). Plant Manager shall be responsible for the enhancement of the benefits of ABT.

4.3.6.3 Provide legal, payroll, accounting and administrative support services with respect to O&M Operator Staff and make payment to O&M Operator Staff.

4.3.6.4 Direct and supervise the O&M Operator Staff while performing Services under the Contract.

4.3.6.5 Maintain discipline of O&M Operator Staff.

4.3.6.6 Provide boarding, lodging and make travel arrangements for all the O&M Operator Staff engaged in providing Services under the Contract, subject to Clause 5.1.18 of the Contract.

4.3.6.7 Comply with labour rules, regulations and statutes specified in Clause 18.0 of the Contract.

4.3.6.8 Employ local people under unskilled category.

4.3.6.9 Give preference to local people in employment of skilled workmen and staff wherever local people with requisite skills are available.

4.3.6.10 Implement proper attendance system for O&M Operator Staff including installation of punching system.

4.3.6.11 Any discrepancy brought to O&M Operator's notice in attendance system shall be corrected immediately and Owner shall have right to deduct pro-rata fees as per price schedule in case of absence or following punching malpractices.

4.3.7 **Consumables and Spare Parts**

4.3.7.1 Procure, supply, package, transport from supplier's works/warehouse, obtain marine insurance, receive, inspect, store, preserve, use and manage Consumables including but not limited to those specified in Clause 4.3.7 and required for:

4.3.7.1.1 operation, maintenance, tests and repairs of the Plant on a 24 (twenty-four) hours per day, 7 (seven) days per week and 365 (three hundred sixty five) days per year basis including all auxiliaries and interconnecting equipment of the Plant including RWIS, associated transmission line and pipe line, rain water harvesting system bore well pumps and associated system, 400 kV and 132 kV switch yard, Fuel gas supply line and Fuel gas conditioning system, etc., ensuring achievement of Performance Guarantees as provided under Clause 10.0 (Guaranteed Performance) of the Contract;

4.3.7.1.2 day-to-day operation and daily, routine, preventive, corrective, predictive and breakdown inspection, testing (nondestructive testing), maintenance and repair of all Plant systems, equipment, components, buildings, structures etc., in accordance with the Contract, Prudent Utility Practice, Project Agreements, Dispatch Instructions, O&M Manuals, recommendations of EPC Contractor/OEM, Applicable Laws, Permits and the O&M Plan and Procedure so as to ensure safe and reliable operation and maintenance of Plant;

4.3.7.1.3 major and minor inspections, overhauls and repair of Plant systems, equipment and structures.

4.3.7.1.4 all unplanned, breakdown inspection, testing (including nondestructive testing), and repairs of the Plant whenever required;

4.3.7.1.5 statutory annual maintenance of HRSG (Boiler). For clarity it is specified that HRSG license renewal fees shall be paid by the Owner;

4.3.7.1.6 taking all corrective actions whenever required consistent with Prudent Utility Practice and approved by Owner in order to achieve the Rated Capacity (or above) during each Settlement Period;

4.3.7.1.7 performing Plant capacity test as and when required by Power Purchaser, System Operator or any other Governmental Authority or by Owner or required as per Project Agreements;

4.3.7.1.8 operation of the Plant in accordance with the Dispatch Instructions of Owner/NERLDC;

4.3.7.1.9 operation and maintenance of metering equipment and performing inspections, calibrations (including calibration of electrical, gas and water metering equipment and Plant instrumentation by third party), metering and tests for which the Owner is responsible under Project Agreements or as may be required by Prudent Utility Practices or by Applicable Law or the Contract;

4.3.7.1.10 controlling outages, both planned and unplanned, in a manner that is consistent with lowest cost, the obligations of the Owner, best utilization of labour and parts, and maximization of productivity by using detailed and integrated plans and schedules and resource management;

4.3.7.1.11 maintenance and repair of CCTV system, Plant lighting, watch towers, boundary wall including barbed wire fencing, security gate complex, all building and structures, Plant road, patrol road and Plant drainage system. For clarity it is specified that supply of materials required for repair of Plant road is in the scope of O&M Operator;

4.3.7.1.12 operation, maintenance and repair of equipment and instruments in mechanical workshop, instrument lab, electrical lab, chemical lab and 2 (two) numbers fire tenders. For clarity it is specified that supply of spare parts for fire tenders is in the scope of O&M Operator;

4.3.7.1.13 performing all the obligations of the Owner under the Project Agreements relating to the operation and maintenance of the Plant;

4.3.7.1.14 operation and maintenance of the Plant in accordance with standard of performance defined in Clause 3.0 of this Technical Specification and in a safe, reliable, efficient and prudent manner; and

4.3.7.1.15 constantly improving the following key performance indicators of the Plant:

4.3.7.1.15.1 Plant Availability;

4.3.7.1.15.2 PLF;

4.3.7.1.15.3 Plant Efficiency and Heat Rate;

4.3.7.1.15.4 equipment wise availability and efficiency;

4.3.7.1.15.5 consumption of Spare Parts;

4.3.7.1.15.6 shut down time for Unit(s) and equipment; and

4.3.7.1.15.7 Number of times and quantum of power drawn from Grid.

4.3.7.2 Supply all the materials required for the fulfilling all the obligations of the Owner (except supply of Spare Parts) under LTSA signed by Owner. It is clarified that all supplies for such maintenance of Gas Turbine and auxiliaries which is not

included in the scope of work of LTSA Contractor shall be supplied by O&M Operator except Spare Parts which shall be supplied by Owner.

4.3.7.3 Supply all chemicals (bulk and fine) required for operation and maintenance of water treatment system including effluent treatment plant and sewerage treatment plant, cooling tower, HRSG, SWAS, Hydrogen plant (operated in two shift operations), laboratories etc.:

4.3.7.3.1 alum, Lime, Polyelectrolyte, hypochlorite, chlorine gas, bleaching powder etc. for Water Pre-treatment plant;

4.3.7.3.2 Hydrochloric Acid (HCl), Sodium Hydroxide (NaOH), Sodium Hypocloride (NaOCl), CIP etc. for DM Plant including Ultra-filtration;

4.3.7.3.3 polyelectrolyte, Hydrochloric Acid, Sodium Hydroxide etc. for Effluent Treatment Plant;

4.3.7.3.4 polyelectrolyte, Alum, Sodium Hypochlorite etc. for Sewage Treatment Plant;

4.3.7.3.5 antiscalant, Corrosion Inhibitor, Bio Dispersant, Sulphuric Acid etc. for CW Treatment Plant;

4.3.7.3.6 chlorine Toner, Sodium Hydroxide etc. for CW Chlorination System;

4.3.7.3.7 chlorine Toner, Sodium Hydroxide etc. for RW Chlorination System; and

4.3.7.3.8 Hydrazine, Ammonia, TSP (Phosphate), Sodium Hydroxide etc. for LP/HP Chemical Dozing System.

4.3.7.4 Supply ancillary materials including but not limited to the following:

4.3.7.4.1 first aid equipment, medicines etc. for on Site emergency medical treatment;

4.3.7.4.2 replenishment of instrument, glass wares, and consumable for electrical laboratory, chemical laboratory, instrument laboratory including calibration gases;

4.3.7.4.3 welding, cutting and testing equipment and accessories including welding electrodes, hard facing electrodes, DA Gas / LPG, Oxygen Gas, Argon gas for Tig welding, welding rods, soldering and brazing materials, welding and cutting appliances, pre and post weld heating and stress relieving arrangement, welding accessories like shields, holders, wire leads, wire brush, dye penetrates, developers, cutting / welding gases, cutting/welding nozzles etc.;

4.3.7.4.4 materials required for Radiography test for welding joint in high pressure system or at any other system where it is required to ensure the quality of welding;

4.3.7.4.5 materials required for carrying out Ultrasonography test for thickness measurement of pipes and tubes, boroscopic inspection, etc.;

4.3.7.4.6 materials required for condition monitoring of Plant equipment and vibration analysis, etc.;

4.3.7.4.7 tapes including insulation tapes, masking tapes, plastic cellulose tapes, fiberglass tapes, teflon tape, etc.;

4.3.7.4.8 cutting and grinding tools including grinding wheels for cutting and buffing, grinding stones, grinding paste, blades, hacksaw, drills bits, tool and tool bits, hand tools and power tools, etc.;

4.3.7.4.9 cleaning agents including cotton rags, rust remover, soap, detergents, disinfectants, thinner, solvent, solvent cements etc.;

4.3.7.4.10 sealants and plugs including thread sealant, gasket sealant, on-line leak sealant, O-ring sealant and jointing compounds, Locktite, Ana Bond, Fevicol, Fevifold, Holdite, Mseal, PVC / CPVC/UPVC Solution, etc.;

4.3.7.4.11 hardware including nails, split pins, binding wires, insulation screws, lead wire, hose clamp, fasteners like bolt/nut/washer (HT/SS/MS/GI), shim (brass/ss), Gouch screw, HT bolts, etc.;

4.3.7.4.12 electrical accessories including electrical Lamps, ballast, ignitors, protective glass for fixtures, electrical fixtures, winding wires, electrical insulation materials, bulbs, flash lights, dry cell batteries, indication lights for switchgear panels, fuses, cable ties, hand lamps with bulbs, plugs, cable glands, cable lugs, ferrules, cable ties, cable jointing and termination kit, soldering paste, soldering rods, etc.;

4.3.7.4.13 stationeries including, computer stationery, tapes and diskette, recorder charts, chart pens, pen inks, calibration sticker, etc.;

4.3.7.4.14 miscellaneous materials like emery sheet, fiber glass sheet, Gaada cloth, marking cloth, pendant holder, petroleum Jelly, soap, twine and varnish, ana bond, araldite, banian cloth, brush, chalkpiece, coir rope, FG Tape varnished roll, fibre glass sheet, fibre sleeve, hand gloves, hose clamps, kerosene, paintbrush, petrol, diesel, petroleum jelly, precision blue paste, raval plugs, rustolene, shellac, spark lighter, twine, varnish, wire brush, etc.;

4.3.7.4.15 hardware including all types of gaskets including gaskets for mating flanges and valve internal gaskets, gasket oil sheets, gasket oil papers, HT/SS/GI/MS bolts and nuts (except casing bolts of gas turbine and steam turbine), studs, washers, circlips, binding wires, 'O' Ring/chords, packing rings, bull rings, seal rings, gland packings, gouch screws, wood screws, nails, split pins, jointing sheets, insulation tape, insulation screws, shims, steam gasket sheet, etc.;

4.3.7.4.16 solvents, primers and paints (grade and make of primers and paints shall be same as originally applied by the EPC Contractor/OEM);

4.3.7.4.17 flexible hoses and hose fittings, small piping, tubings pipe and tube fittings, adapters / ferrule fittings, unions etc.;

4.3.7.4.18 lubricants, oils, greases including transformer oils, lubrication oil, jacking oil, cooling oils, hydraulic oil, control oils etc., and arrangement of its purification.;.

4.3.7.4.19 filters / filter separator elements (except filters for inlet air system of gas turbine);

4.3.7.4.20 spare parts required for operation, repair and maintenance of fire tenders;

4.3.7.4.21 safety equipment, fire extinguisher chemicals (e.g. CO_2 and DCP Powder etc.), safety appliances and personal protective equipment, hand gloves, safety shields, gumboots aprons, fire hoses for replacement, fire blankets etc;

4.3.7.4.22 coupling spiders, coupling rubber bushes, insulation materials (LRB and ceramic wools), gland packings, etc;

4.3.7.5 Supply such items not specifically mentioned in this Technical Specification or the Contract but necessary for successful fulfillment of O&M Operator's obligation under the Contract as per Prudent Utility Practices;

4.3.7.6 Supply all chemicals, oils, lubricants, grease, gases, etc. including transformer oils, lubrication oil, jacking oil, cooling oil, hydraulic oil, control oil etc. along with Material Safety Data Sheet. Maintain stock of each type and grade of oil, lubricants etc at site in sufficient quantity to meet 12 months of regular consumption and also emergency requirement. Quantity of oil to meet emergency requirement shall be sufficient to fill at least one (largest) equipment to meet emergency situation

4.3.7.7 Procure all Consumables as per specification provided by OEM/EPC Contractor and from source recommended by OEM/EPC Contractor (if any) and in each case approved by Owner.

4.3.7.8 Receive, inspect, store, preserve, use and manage Spare Parts (procured and supplied by Owner) required for uninterrupted and trouble free operation and maintenance of the Plant supplied by Owner as specified in Clause 27.0 of the Contract.

4.3.7.9 Implement duly approved cost effective Inventory Management and Procurement Procedure for Spare Parts, Consumables and other materials as specified in Clause 27.0 of the Contract.

4.3.7.10 Ensure that Spare Parts, Consumables and other materials required for operation, maintenance and repair of the Plant are properly stored, preserved and accounted for and that adequate stock is available at all times to support uninterrupted operation and maintenance of the Plant.

4.3.7.11 Maintain and control inventory, as per mutually agreed Annual Operating Plan and Budget, of all the materials required to operate and maintain the Plant, including Spare Parts, Consumables, tools, vehicles, mobile equipment etc.

4.3.7.12 Assist Owner in cost reduction measures as specified in the Contract including Clause 27.11 of the Contract.

4.3.8 **Fuel Supply**

4.3.8.1 Co-ordinate and/or perform on a day-to-day basis all functions required by the Owner pursuant to the terms of the Gas Sales and Purchase Agreement **("GSPA")** and in accordance with the Fuel management plan, for the scheduling of deliveries, metering of deliveries, taking delivery of Fuel (Natural Gas) and be responsible for timely scheduling of required quantity of Fuel so as to avoid imposition of take-or-pay obligation on Owner. O&M Operator shall be responsible for making accurate daily, monthly and yearly nominations of the Fuel under GSPA. Please refer Annexure-2 of this Technical Specification for a summary of the terms of the GSPA and the Owner's scope of obligations under GSPA to be performed by O&M Operator.

4.3.8.2 Carry out regular Fuel analysis of Fuel and inform Owner and Fuel Supplier regarding off-spec gas delivered.

4.3.8.3 Calibrate metering equipment as per statutory requirements, requirements under GSPA and requirements under the Contract.

4.3.8.4 The Owner shall be responsible for delivering Fuel at the battery limit at all times starting from Commercial Operation Date of Unit-1 during the Term of the Contract.

4.3.9 **Power Supply/Sale**

O&M Operator shall perform on a day to day basis all the scope of services and obligations of the Owner under Power Purchase Agreements. Please refer Annexure-3 of this Technical Specification for a summary of the PPAs and Owner's scope of services and obligations under PPAs to be performed by O&M Operator.

4.3.10 **Safety**

4.3.10.1 Comply with safety requirements specified in Clause 41.0 of the Contract.

4.3.10.2 Implement safety program in accordance with HES Policy. Implement a continuing program of training of O&M Operator Staff and staff of the Owner to keep them abreast of safety requirement and emergency procedure. Conduct periodic safety drill as per the HES Policy.

4.3.10.3 Ensure safety of the Plant, the O&M Operator Staff, other personnel employed by O&M Operator for the Services and other individuals and invitees who are at any time on the Site, through the development and observance of an appropriate safety program.

4.3.10.4 Provide first aid equipment and staff trained in first aid for on-site emergency medical treatment. Owner shall provide reasonably equipped medical centre in due course of time.

4.3.11 **Litigation, Clearances and Information**

4.3.11.1 Notify the Owner promptly upon obtaining knowledge of any event or casualty which may be claimed under an insurance policy of the Owner or the O&M Operator maintained, pursuant to the Contract or any of the other Project Agreements, and provide all information required by the Owner to submit insurance claims and continue to assist the Owner in submitting and pursuing such claims. All claims related to insurance policies procured and maintained by O&M Operator shall be submitted and pursued by O&M Operator.

4.3.11.2 Notify the Owner promptly upon obtaining knowledge of any potential warranty claim which may be asserted against any manufacturer, contractor or vendor providing services, materials or equipment for the Plant and provide all information required by the Owner to assert such warranty claims and continue to assist the Owner in asserting and prosecuting such claims.

4.3.11.3 Notify the Owner promptly upon obtaining knowledge of any litigation, claim, disputes or actions actually filed or any material litigation, claims, disputes or actions which are threatened in writing, concerning each case the Owner, the O&M operator, the Plant or the Services.

4.3.11.4 Notify the Owner promptly upon obtaining knowledge of any actual refusal to grant, renew or extend or any delay or cause to anticipate delay in the grant, renewal or extension of any clearances/Permits/licenses or any action pending, or any action filed with respect to grant, renewal or extension of any clearances/Permits/licenses or any material action threatened in writing regarding the same.

4.3.11.5 Notify the Owner promptly upon obtaining knowledge of any penalty imposed or notices of violation issued by any Government Agency.

4.3.11.6 Notify the Owner promptly upon obtaining knowledge of any dispute with power purchaser, Fuel Supplier or any Government Agency which may have material adverse effect on the business or affairs of the Owner or O&M Operator, the operation and maintenance of the Plant or performance of the Services.

4.3.12 **Drawings, Documents, Data and Reports**

4.3.12.1 Prepare and maintain operating logs, reports and records as specified in Clause 32.0 of the Contract, documenting the operation and maintenance of the Plant including such logs, records and reports required under Project Agreements including PPA, applicable laws, permits, etc.

4.3.12.2 Establish and maintain the Plant library and update drawings, O&M Manuals, O&M Plan and Procedures as and when required as specified in Clause 32.0 of the Contract.

4.3.12.3 Prepare and submit to the Owner Daily Report, Monthly Report, Annual Report and other reports and information relating to operation and maintenance of the Plant as specified in Clause 32.0 of the Contract.

4.3.12.4 Make available data and records including meter reading required by the Owner for the preparation of invoices to the power purchasers for billing periods established in connection with PPA or Project Agreements.

4.3.12.5 Make available data and records including meter reading required by Owner for verifying invoices of Fuel and water supplier as per GSPA and State Support Agreement and making payment for Fuel and water.

4.3.12.6 Retain and preserve operating documents and historical operating data as specified in Clause 32.0 of the Contract.

4.3.12.7 Provide any and all information required by LTSA Contractor under LTSA related to operation and maintenance of Gas Turbines, its Auxiliaries and its control system. This information shall be provided through Owner in the form acceptable to LTSA Contractor.

4.3.13 **Plant Management System and Quality Management System**

4.3.13.1 Implement O&M Plan and Procedure prepared by O&M Operator and approved by Owner as per Clause 4.5 of this Technical Specification so as to maximize equipment and Plant reliability, efficiency and availability and generate power at lowest cost.

4.3.13.2 Implement duly approved cost effective Inventory Management and Procurement Procedure for Spare Parts, Consumables and other materials as specified in Clause 27.0 of the Contract.

4.3.13.3 Prepare and submit to the Owner for his approval Annual Operating Plans and Budgets and three year forward maintenance plan as specified in Clause 5.0 and Clause 6.0 of this Technical Specification.

4.3.13.4 Adopt and use quality management systems and statistical techniques such as total productive maintenance and mean time between failure analysis.

4.3.13.5 Carry out all the work, including establishing/modifying systems and procedures required for getting ISO-9001, ISO-14001, OHSAS-18001, ISO-50001, and ISO-55000 quality accreditation, resolving non-conformances and successfully obtaining recertification to the latest applicable standards of ISO/OHSAS for the Plant under the guidance and directions of the owner and consultant appointed by the Owner.

4.3.13.6 Operate and maintain Plant Maintenance Module of SAP.

4.3.14 **License, Permits, Clearance**

4.3.14.1 Obtain, renew, and maintain Permits, clearances and licenses required to be obtained and maintained by the O&M Operator pursuant to Clause 42.0 of the Contract for providing Services under the Contract and submit copy of all such licenses, Permits and clearances to the Owner within 7 (seven) days of receipt of the same.

4.3.15 Ensure compliance to all the terms and conditions specified in Permits, licenses, clearances, etc. including environmental conditions specified in consent to operate issued by Tripura State Pollution Control Board and clearance given by Ministry of Environment and Forest e.g. quality of effluent to be discharged, quality of flue gas coming out of the stack.

4.3.16 **Insurance Policies**

4.3.16.1 Procure and maintain insurance policies required to be procured and maintained by the O&M Operator as specified in Clause 13.0 of the Contract and submit copy of all such insurance policies to the Owner within 7 (seven) days of receipt of the same.

4.3.17 **Security**

4.3.17.1 Implement and ensure compliance with Owner's assistance of Plant security plan of Owner. Owner has engaged services of Tripura State Rifles for providing round the clock security of the Plant. Further, watch towers and CCTV system have been installed to ensure security of the Plant.

4.3.18 **Access to the Plant by Owner**

4.3.18.1 It is understood by O&M Operator that the Plant is owned by the Owner and it has a right to enter any part of the Plant any time, inspect, audit or do as it deems fit and is necessary in the interest of the Plant.

4.3.18.2 The Owner may allow access to the Plant to the consultants appointed by the Owner, Lender's engineer, power purchaser, Fuel Supplier, insurance surveyor, any Government Agency or any other person as provided in Clause 33.0 of the Contract.

4.3.19 **Plant Metering, Testing and Inspection**

4.3.19.1 O&M Operator shall carryout, as and when requested by Owner, performance test, capacity test, heat rate tests or any other test of the Plant or any calibration tests of the invoice meters of electricity, gas and water and provide the written reports and analysis on the test results.

4.3.19.2 These tests may be witnessed by the Owner, the O&M Operator, the consultants appointed by the Owner, power purchaser, Lender's engineer, any Government Agency.

4.3.19.3 These tests shall be carried out using normal operating measuring equipment.

4.3.19.4 O&M Operator shall allow and facilitate at all times inspection of Plant, operation and maintenance logs, records, reports, plan, policy and procedures, drawings, documents, licenses, Permits, clearances, etc. by Government Agency, Owner or any other person or agency or organization authorized by Owner.

4.3.19.5 Arrange and pay for timely testing and certification (including load test) of all material handling equipment including cranes, hoists and lifts by third party testing and certifying agency as per Applicable Laws. For clarity it is specified that arranging loads for testing of material handling equipment is in the scope of O&M Operator.

4.3.20 **Maintenance Tools & Tackles**

4.3.20.1 Provide all maintenance tools and tackles as specified in Clause 28.0 of the Contract.

4.3.20.2 Indicative list of instruments to be deployed by O&M Operator is given in Annexure-4 of this Technical Specification. This list is not exhaustive, and O&M Operator shall deploy all instruments required for providing Services under the Contract. If Owner believes that any additional tools and tackles or instruments are required to be mobilized over and above those mobilized by O&M Operator, same shall be mobilized by O&M Operator without any delay and without any additional cost to Owner.

4.3.21 **General**

4.3.21.1 Assist and cooperate with the Owner, stakeholders, contractors, and Government Agencies as and when requested/required.

4.3.21.2 Be responsible for good housekeeping and cleanliness of the Plant. Housekeeping shall not be limited to the buildings, cleaning of roads, drains, equipment, systems, pipes racks, pipe trenches, cable trays, cable trenches, switch yard, all the ancillary plant buildings, different floors of power house building and equipment including sanitary services, etc. in the Plant. For clarity it is specified that only internal housekeeping and cleaning of the Administration Building, Training Hostel, Training Centre, Security Hostel, Medical Centre and Canteen building is excluded from the scope of work of the O&M Operator.

4.3.21.3 Clean the Plant buildings, equipment, machines, apparatus, system, etc.

4.3.21.4 Mechanized cleaning of equipment, floors, road, offices etc.

4.3.21.5 Hiring of telescopic cranes, as and when required, during maintenance.

4.3.21.6 To ensure proper packaging of equipment and Spare Parts while sending for repair.

4.3.21.7 Proper housekeeping of store and proper stacking of Spare parts at its designated location.

4.3.21.8 Proper maintenance of store viz. roof/ shutter/ window repairing.

4.3.21.9 Ensure participation of all O&M Operator Staff in "SWACHH OTPC" initiative. Arrange and provide necessary tools and equipment (like hand gloves etc.) for O&M Operator Staff and Owner's Staff.

4.3.21.10 Establish and maintain good relations with the local community. Assist Owner in conducting community relations program.

4.3.21.11 Maintain the Plant free and clear of all liens and encumbrances resulting from any action of O&M Operator or work done at the request of O&M Operator.

4.3.21.12 Except where such action is expressly permitted by this Contract, O&M Operator shall not take any action that would cause default under any Project Agreements.

4.3.21.13 Promptly submit to the Owner any material information concerning new or significant aspects of the Plant's activities and, upon Owner's request, promptly submit any other information concerning the Plant or the Services.

4.3.21.14 Be responsible for disposing-off safely all Plant waste including waste oils, lubricants etc and wastes from administration building, training hostel, training centre, medical centre, security hostel and canteen.

4.3.21.15 Provide Optional Services as provided in Clause 8.0 of this Technical Specification.

4.3.21.16 All planned and unplanned outage shall be handled on 24 (twenty four) hours per day, 7 (seven) days per week and 365 (three hundred sixty five) days per year basis and no overtime shall be payable by Owner towards any Services performed by O&M Operator.

4.3.21.17 Owner is registered with UNFCCA for obtaining carbon credits/CDM/VER benefits for its Plant. O&M Operator shall comply with all necessary requirements/regulations/directives in this regard as need to be followed or instructed by the Owner and also ensure whatsoever necessary for claiming/availing the carbon credit benefits. It shall also do whatever is necessary during operation of the plant so as to maximize the carbon credit benefits.

4.3.22 **Exclusion from the Scope of Services of O&M Operator:**

4.3.22.1 Scheduled maintenance of Gas Turbine i.e., Combustion Inspection (CI), Hot Gas Path Inspection (HGPI) and Major Inspection (MI) and collateral damage to Gas Turbine Compressor. Scheduled maintenance of Gas Turbine and repair of compressor due to collateral damage shall be done by LTSA Contractor, except the services to be performed by the O&M Operator as part of services for maintenance of Gas Turbines, auxiliaries and control system. Please refer

Annexure-1 to Technical Specification for Services to be provided by O&M Operator for maintenance of Gas Turbine, auxiliaries and control system.

4.3.22.2 Arrangement of Fuel (natural gas), and start up power.

4.3.22.3 Horticultural, landscaping of the entire Plant including pump house area at the bank of the river.

4.3.22.4 Office space (as per Owner's standard) with furniture, fixtures, telephone and fax. Maintenance of office and payment of telephones and fax bills are in the scope of O&M Operator. Computers for office work by O&M Operator Staff of O&M Operator shall be in the scope of O&M Operator. However, 11 (eleven) desktop computer shall be provided by the Owner for limited purpose of working on SAP. For clarity it is specified that O&M Operator shall make its own arrangement for internet connection.

4.3.22.5 Mechanical workshop, instrument lab, electrical lab, and chemical lab with equipment and instruments given in Annexure-5 of this Technical Specification. However, supply of consumables for operation, maintenance and repair of equipment and instruments listed in Annexure-5 of this Technical Specification are part of the O&M Operator's scope of Services. Any additional equipment and instruments, over and above those specified in Annexure-5 of this Technical Specification, required for performing Services under the Contract shall be arranged by O&M Operator and the price for which is included in Contract Price.

4.3.22.6 Covered store and open storage yard. Management and operation of the store under supervision of Owner shall be done by O&M Operator.

4.3.22.7 Furnishing Spare Parts for the Plant. Spare Parts shall be procured and supplied by Owner based on O&M Operator's recommendation consistent with Annual Operating Plan and Budget.

4.3.22.8 Security of he plant. However, maintenance of boundary wall, fencing, watchtower, Plant road, patrol road and CCTV system is included in O&M Operator's scope of Services.

4.3.22.9 Internal housekeeping and cleaning of administrative building, trainee hostel, training center, security hostel, medical center and canteen.

4.3.22.10 Due to limited time available with O&M Operator for awarding contract for hiring agencies / service engineers, Owner shall award the contract for certain services listed in Annexure-7 to be performed during scheduled shutdown of Unit-1 in March-April 2021 and scheduled shutdown of Unit-2 in January-February 2021. Owner's obligation in respect of services listed in Annexure-7 is limited to awarding contract and making payment for these services. All other responsibilities in respect of these services including coordination with hired agencies for timely mobilization, supervision of work, providing necessary support by providing all required tools & tackles, skilled and unskilled workmen, and taking all necessary action for ensuring satisfactory and timely completion of work shall be of O&M Operator

4.4 SERVICES BY O&M OPERATOR ON EXPIRATION OR TERMINATION OF CONTRACT

4.4.1 Upon expiration or termination of the Contract, the O&M Operator shall take following action:

4.4.1.1 Leave the Plant in as good condition as it was at the time of taking over from Existing O&M Contractor, normal wear and tear excepted.

4.4.1.2 Prepare and hand over an updated inventory list of all chemicals, consumables, oil, lubricants, Spare Parts, fixtures, special tools and tackles and equipment forming a part of the Plant or being the subject of the Services, which are the property of the Owner.

4.4.1.3 Hand over all items of chemicals, consumables, oil, lubricants, spares, special tools and tackles, equipment, desktops and any other material belonging to Owner to the Owner's stores in the condition in which such items were originally received by the O&M Operator, normal wear and tear excepted, as shown in the updated inventory list.

4.4.1.4 Remove all of the O&M Operator's tools, equipment and materials brought by O&M Operator from the Site (which are not identified on the updated inventory list) with Owner's approval.

4.4.1.5 Hand over an updated Spare Parts stock list taking into account all additions and deletions during the Term of the Contract.

4.4.1.6 Deliver to the Owner all drawings, documents, O&M Manuals, O&M Plan and Procedures, logs, reports, records, etc. of the Plant including those developed by O&M Operator while performing Services under the Contract.

4.4.1.7 Remove all the O&M Operator Staff except as otherwise instructed by Owner. O&M Operator shall solely be liable for resettlement, compensation or any other obligations towards O&M Operator's Staff. O&M Operator shall keep Owner indemnified against claims, if any pertaining to O&M Operator's Staff.

4.4.1.8 Settle all dues, recoveries, insurance claims relevant to O&M Operator, if any with the Owner.

4.4.1.9 Owner shall have the right, in its sole discretion, to assume and become liable for any contracts or obligation that O&M Operator may have taken with third parties in connection with the Services. O&M Operator shall cooperate in taking all reasonable steps requested by Owner required to effect the assumption of the contracts, provided that Owner agrees to indemnify and hold harmless O&M Operator from all liabilities out of events and obligations arising from the assumption of contract rights and obligations after the date of any such assumption.

4.4.1.10 Use all reasonable efforts to cooperate with Owner or a Successor Operator to assure that the operation, maintenance, repair and management of the Plant are not disrupted.

4.5 OPERATIONS & MAINTENANCE PROCEDURE

4.5.1 The O&M Operator shall prepare and submit to the Owner:

4.5.1.1 6 (six) complete sets of a preliminary draft of the O&M Plan and Procedures for review and comment by the Owner within 30 (thirty) days from the Effective Date;

4.5.1.2 6 (six) complete sets of a final draft of the O&M Plan and Procedures for review and approval by the Owner within 15 (fifteen) days from the date of receipt of Owner's comments on preliminary draft; and

4.5.1.3 6 (six) complete sets of the final O&M Plan and Procedures for review and approval by the Owner within 15 (fifteen) days from the date of receipt of Owner's comments on final draft.

4.5.2 O&M Plan and Procedure to be prepared by O&M Operator shall be in accordance with, among other sources, this Contract, O&M Procedure available with Owner, Prudent Utility Practice, Project Agreements, Dispatch Instructions, O&M Manuals provided by EPC Contractor, recommendations of EPC Contractor/OEM, EPC Contract warranties, Applicable Laws, Permits, etc.

4.5.3 If the Owner determines that the O&M Plan and Procedures submitted by the O&M Operator pursuant to Clause 4.5.1 are complete, accurate and in accordance with the standards set forth in Clause 4.5.2, then the Owner shall notify the O&M Operator of the Owner's acceptance of such O&M Plan and Procedures within 30 (thirty) days after receipt of the same from the O&M Operator. If the Owner reasonably determines that such O&M Plan and Procedures are not complete, accurate or in accordance with the standards under Clause 4.5.2 in any respect, the Owner shall, within such 30 (thirty) day period, provide written comments on such O&M Plan and Procedures to the O&M Operator stating the Owner's reasons for its disapproval of, and any proposed revisions to, any portion thereof. Within 7 (seven) days of receipt of the Owner's comments on such O&M Plan and Procedures, the O&M Operator shall respond in writing to the Owner's comments stating the O&M Operator's agreement or disagreement and noting any proposed revisions to the O&M Plan and Procedures or, if the O&M Operator disagrees with the Owner, explaining why no change to such O&M Plan and Procedures is required by the standards described in Clause 4.5.2. Thereafter, the Owner and the O&M Operator shall cooperate to agree upon O&M Plan and Procedures reasonably acceptable to the Owner. The foregoing review and approval procedure shall apply equally to each revision of the O&M Plan and Procedures submitted to the Owner pursuant to this Contract.

4.5.4 The Owner may from time to time, consistent with the standards described in Clause 4.5.2, request amendments or modifications to the O&M Plan and Procedures. The Owner and the O&M Operator shall meet to agree upon the text of any such amendments or modifications, provided that no such amendment or modifications shall be deemed included in the O&M Plan and Procedures without the written approval of both the O&M Operator and the Owner (which shall not be unreasonably withheld by either Party).

4.5.5 The O&M Operator from time to time may, and when necessary shall, by written request to the Owner, propose amendments or modifications to the O&M Plan and Procedures. Such request shall include the text of any proposed amendments and modifications as well as the reasons thereof in sufficient detail to permit the Owner to consider the proposed amendments and modifications in accordance with the standards set forth in Clause 4.5.2 above within 15 (fifteen) days after receipt by the Owner of such request, the Owner shall respond in writing to the O&M Operator stating its acceptance of the proposed amendments and modifications (or any portion thereof) or stating the Owner's disapproval of any such amendments and modifications and its reasons thereof. The Owner and the O&M Operator shall thereafter meet to agree upon the final text of any amendments or modifications of the O&M Plan and Procedures required by the

standards set forth in Clause 4.5.2; provided, however, that no such amendment or modification shall be deemed included in the O&M Plan and Procedures without the written approval of the Owner (which approval shall not be unreasonably withheld).

4.5.6 Such O&M Plan and Procedures shall be based on the standard of performance given in Clause 3.0 of Technical Specification, designs of the Plant, and O&M Plan and Procedure available with Owner. This O&M Plan and Procedure shall deal with all operations interfaces between Owner, the O&M Operator, System Operator and transmission utility including the methods of day-to-day communication, Key Personnel, clearances, outages scheduling, capacity and energy reporting, operations log etc.

4.5.7 Suggested outline of O&M Plan and Procedure to be developed by O&M Operator are given hereunder and are subject to discussion and finalization.

4.5.7.1 ***Project Performance Monitoring Program***

4.5.7.1.1 Project description;

4.5.7.1.2 Project performance monitoring;

4.5.7.1.3 Fuel management;

4.5.7.1.4 Water management;

4.5.7.1.5 Project chemistry control;

4.5.7.1.6 Emission discharge management;

4.5.7.1.7 Effluent discharge management;

4.5.7.1.8 Project permits and environmental reporting; and

4.5.7.1.9 Status of major equipment.

4.5.7.2 ***Unit Operating Program***

4.5.7.2.1 Start-up procedure – Cold/Hot/Normal/Emergency;

4.5.7.2.2 Shut down procedure – Cold/Hot/Normal/Emergency;

4.5.7.2.3 Standard Operating Procedure (SOP);

4.5.7.2.4 Operating procedure for equipment;

4.5.7.2.5 Shift / routine operating practices;

4.5.7.2.6 Dispatch procedure; and

4.5.7.2.7 Interconnection Facilities.

4.5.7.3 ***Unit Maintenance Program***

4.5.7.3.1 Part identification;

4.5.7.3.2 Inspection procedures;

4.5.7.3.3 Overhauling procedure;

4.5.7.3.4 Inspection and maintenance plan;

4.5.7.3.5 Maintenance schedule;

4.5.7.3.6 Preventive maintenance;

4.5.7.3.7 Predictive maintenance;

4.5.7.3.8 Condition monitoring – planning and procedure;

4.5.7.3.9 Maintenance procedures; and

4.5.7.3.10 Lubricant specification.

4.5.7.4 ***Inventory Management Program***

4.5.7.4.1 Codification of inventory;

4.5.7.4.2 Procurement specification for inventory;

4.5.7.4.3 Recommended vendor list for inventory;

4.5.7.4.4 Minimum stock level, maximum stock level, reorder level, economic order quantity, lead time for procurement, shelf life, etc.;

4.5.7.4.5 Inventory Analysis: ABC analysis, Fast/Slow/Non-moving analysis, VED Analysis;

4.5.7.5 The diagnostic testing program for maintaining the Plant and equipment, including both system and component level testing.

4.5.7.6 The problem assessment program which provides the procedure for determining the cause(s) of operational or equipment failures and preventing future failures through recommended improvements, including justification for such recommendation (i.e. basis for such recommendation and economic analysis).

4.5.7.7 Unit testing program and procedure.

4.5.7.8 Emergency procedures.

4.5.7.9 Operation of Materials Management Module and Plant Maintenance Module of SAP;

4.5.7.10 Operating log requirements;

4.5.7.11 Alarm and trip settings;

4.5.7.12 Reportable events;

4.5.7.13 Training procedure;

4.5.7.14 Employee manual; and

4.5.7.15 Effluent and waste disposal procedures.

4.5.8 **Maintenance Plan**

4.5.8.1 Maintenance plan to be prepared and submitted to Owner pursuant to Clause 4.5.8 shall include but not be limited to the following:

4.5.8.1.1 Preparation of report of preventive maintenance, predictive maintenance, trend and analysis report, inventory consumption, Plant availability/down time, failure analysis, preventive maintenance effectiveness and specific consumption etc.

4.5.8.1.2 Records of equipment inspection's operational checks relating to facility as per good engineering practices, records of maintenance and repairs carried out.

4.5.8.1.3 Devising maintenance strategy based on equipment criticality analysis to establish best practices of preventive maintenance, and condition based maintenance.

4.5.8.1.4 Planning and scheduling of maintenance jobs.

4.5.8.1.5 Executing maintenance task of preventive maintenance/lubrication schedule.

4.5.8.1.6 To carry out the predictive maintenance/opportunity maintenances.

4.5.8.1.7 To carry out reliability based condition monitoring maintenance.

4.5.8.1.8 To carry out turnaround maintenance.

4.5.8.1.9 Carry out repairs and replacement of the equipment (including fills cleaning/replacement of the cooling towers, cleaning of the reservoirs).

4.5.8.1.10 Installation of additional pumps along with piping on need basis at river water intake system to cater water requirement of plant, as per the requirement.

4.5.8.1.11 Ensuring optimum Plant/equipment availability for the operations.

4.5.8.1.12 Ensure quality and workman ship for the operation and maintenance services is rendered.

4.5.8.1.13 Provide periodic maintenance reports: daily/weekly/monthly/annual.

5.0 **THREE YEAR FORWARD MAINTENANCE PLAN**

5.1 At least 90 (ninety) days prior to beginning of each Operating Year, the O&M Operator shall prepare and submit to the Owner the three year forward maintenance plan, detailed on a monthly basis, and shall set forth, in form and substance reasonably acceptable to the Owner:

5.1.1 anticipated operations, repairs, capital improvements, teardowns and major overhauls;

5.1.2 routine, preventive and predictive maintenance and overhaul schedules;

5.1.3 planned procurement (including equipment, Spare Parts, chemicals, consumables, oils, lubricants inventories);

5.1.4 labour activities (including staffing, holidays);

5.1.5 administrative activities;

5.1.6 details of other work proposed to be undertaken by the O&M Operator;

5.1.7 projected yearly budgetary requirements for the Spare Parts, capital improvements and other works not included in O&M Operator's scope of Services; and

5.1.8 assumptions and implementation plan.

5.2 In preparing and providing the three year forward maintenance plan, the O&M Operator shall apply the standards of performance provided in Clause 3.0 above and make such plan consistent with the guaranteed performance parameters in this Contract. Any actions proposed under the three year forward maintenance plan shall be consistent with the O&M Plan and Procedures and the O&M Operator's obligations set forth in this Contract.

5.3 Owner shall review three year forward maintenance plan within 30 (thirty) days of receipt of same. Owner may, by written request, propose changes, additions, deletions and modifications to the proposals. Owner and O&M Operator will then meet and use their reasonable efforts to agree upon a final three year forward maintenance plan and budget, which shall be approved in writing by both parties.

5.4 If by the first day of any Operating Year after the first Operating Year, three year forward maintenance plan is not approved in its entirety by both parties, the proposed three year forward maintenance plan submitted by O&M Operator, together with Owner's final suggested changes, additions, deletions and modifications shall serve as three year forward maintenance plan.

5.5 The three year forward maintenance plan shall be used only for planning and comparison purposes and shall not constrain O&M Operator in its actions or expenditures provided, however, that O&M Operator shall be required to conform in its operations to the Annual Operating Plan and Budget as provided in this Contract.

6.0 ANNUAL OPERATING PLAN & BUDGET

6.1 At least 90 (ninety) days prior to beginning of each Operating Year, the O&M Operator shall prepare and submit to the Owner proposed annual operating and maintenance plan and budget **("Annual Operating Plan and Budget")** for the following Operating Year (or portion thereof), detailed on a monthly basis, and shall set forth, in form and substance reasonably acceptable to the Owner:

6.1.1 anticipated operations, repairs, capital improvements, teardowns and major overhauls;

6.1.2 routine, preventive and predictive maintenance and overhaul schedules;

6.1.3 planned procurement (including equipment, Spare Parts, chemicals, consumables, oils, lubricants inventories);

6.1.4 labour activities (including staffing, holidays, etc.);

6.1.5 administrative and support activities;

6.1.6 details of other services proposed to be performed by the O&M Operator;

6.1.7 projected Fuel and water requirement;

6.1.8 budgetary requirements for the Spare Parts, capital improvements and other services not included in O&M Operator's scope of Services; and

6.1.9 assumptions and implementation plan.

6.2 In preparing and providing the Annual Operating Plan and Budget, the O&M Operator shall apply the standards of performance provided in Clause 3.0 above and make such plan consistent with the guaranteed performance parameters in this Contract. Any actions proposed under the Annual Operating Plan and Budget shall be consistent with the O&M Plan and Procedures and the O&M Operator's obligations set forth in this Contract.

6.3 Owner shall review proposed Annual Operating Plan and Budget within 30 (thirty) days of receipt of same. Owner may, by written request, propose changes, additions, deletions and modifications to the proposals. O&M Operator shall provide Owner any cost information in O&M Operator's possession from previous operating years applicable to items in proposed Annual Operating Plan and Budget. Owner and O&M Operator will then meet and use their reasonable efforts to agree upon a final Annual Operating Plan and Budget, which shall be approved in writing by both parties. Except to the extent that the terms of Clause 43.0 of the Contract permit O&M Operator to take actions which are outside the approved Annual Operating Plan and Budget without the consent of Owner, the approved Annual Operating Plan and Budget shall remain in effect throughout the applicable Operating Year, subject to revisions and amendments proposed by either Party and consented to in writing by the other Party.

6.4 If by the first day of the any Operating Year after the first Operating Year, the parties are unable to reach agreement concerning any items or portion of the Annual Operating Plan and Budget for such Operating Year, then the amount(s) of such items or portion of the Annual Operating Plan and Budget shall be equal to 105% (one hundred five percent) of the amount for the corresponding item or portion of the approved Annual Operating Plan and Budget for the preceding Operating Year.

6.5 The O&M Operator shall notify the Owner as soon as reasonably possible of any significant deviations or discrepancies from the projections contained in the approved Annual Operating Plan and Budget.

7.0 OBLIGATION OF THE OWNER

7.1 The Owner shall furnish to the O&M Operator, at the Owner's cost and expense, the information, documents, materials and other items described in this Clause 7.0. All such items shall be made available at such times and in such a manner as may be reasonably required for the expeditious and orderly performance of the Services by the O&M Operator. From the Effective Date and during the Term, the Owner shall:

7.1.1 make the Units available to the O&M Operator;

7.1.2 make upgrades, addition, improvements and changes to the Plant which the Owner determines to be necessary or advisable in his judgment or in order to comply with any Directives and any relevant Change in Law. O&M Operator will be held harmless and will be compensated where applicable with regard to unsuccessful implementation of such measures as well as outages and non-availability of Plant due to such modifications and any increase in operation and maintenance cost;

7.1.3 procure all Spare Parts as specified in Clause 27.0 of the Contract;

7.1.4 provide to the O&M Operator drawings and documents as specified in Clause 32.0 of the Contract;

7.1.5 obtain, renew and replace whenever required all Permits, clearances and licenses required to be obtained and maintained by the Owner pursuant to Clause 42.0 of the Contract;

7.1.6 provide reasonable assistance to O&M Operator in obtaining, renewing and replacing all licenses and Permits required to be obtained and maintained by O&M Operator at his cost pursuant to Clause 42.0 of the Contract;

7.1.7 make payment to the O&M Operator for Services performed under this Contract as per Clause 7.0 of the Contract;

7.1.8 provide the O&M Operator with reasonable access to the Plant as specified in Clause 33.0 of the Contract;

7.1.9 procure and maintain insurance policies required to be procured and maintained by the Owner as specified in Clause 13.0 of the Contract;

7.1.10 administer Project Agreements, with reasonable assistance from O&M Operator as specified in Clause 19.0 of the Contract;

7.1.11 notify the O&M Operator of any emergency about which Owner has become aware and take further action as specified in Clause 43.0 of the Contract;

7.1.12 liaise with the Government Agencies and the public and provide such cooperation and information to public and Government Agencies and government officials as the Owner may determine to be necessary or appropriate under the circumstances on matters that are related to or will affect the provision of Services in accordance with this Contract;

7.1.13 provide security at Site as specified in Clause 35.0 of the Contract;

7.1.14 procure and supply Fuel at battery limits; and

7.1.15 procure permission for drawing water from Gumti River.

8.0 OPTIONAL SERVICES

8.1 The Owner may, from time to time, ask O&M Operator to perform any Optional Services, for which the Owner shall make payment of such amounts as prescribed under Annexure 14 of the Contract.

8.2 The Owner may, from time to time, ask O&M Operator to perform additional service/items/materials (not otherwise covered under the Contract) for which the Owner shall make payment to be mutually agreed on case to case basis.

8.3 Owner shall be at liberty to procure Optional Services/additional services/items/materials from any other service provider without invalidating any provisions of the Contract.

8.4 O&M Operator may suggest implementing improvements, modifications, upgrading or addition to the original design of the Plant and the same may be executed only with prior approval of Owner. Any such services shall be considered as additional services to the extent that it requires external help from a consultant or a service provider for engineering and execution work. The basic concept development and techno-economic feasibility work along with report submission is included in original scope of Services to be provided by O&M Operator and shall not be considered additional services.

8.5 The Owner may, from time to time, ask O&M Operator to provide additional manpower for performing the services which is not included in the scope of Services of the O&M Operator. O&M Operator shall provide additional manpower, as and when requested by the Owner, as per the schedule of price for manpower provided by the O&M Operator and as set out in Part E of Annexure 2 (Contract Price) to the Contract.

9.0 BATTERY LIMIT

9.1 The Site and boundaries of installation which are responsibility of O&M Operator are indicated in plot plan, RWIS layout and river water intake pipeline alignment drawing.

9.2 For clarity it is understand by O&M Operator that all the facilities coming within the area marked on the plot plan are within the scope of Services of O&M Operator except otherwise specifically mentioned in the Contract.

ANNEXURE-1

SERVICES TO BE PROVIDED BY O&M OPERATOR FOR GAS TURBINES

1.0 Owner has entered into following Long Term Service Agreement **("LTSA")** for maintenance of Gas Turbines installed in the Plant:

1.1 Parts supply and repair service agreement between Owner and GE Energy Parts Inc.; and

1.2 Maintenance service agreement between Owner and General Electric International Inc.

2.0 Under above mentioned LTSA for Gas Turbines, Owner has to provide certain services and fulfill certain obligation. All these services and obligations shall be considered included in the scope of Services of O&M Operator under the Contract and O&M Operator shall perform all these services and fulfill all these obligations as specified in LTSA (except payment for services and supply and repair of spare parts by LTSA Contractor). Services and obligations to be performed by O&M Operator shall include, but not be limited to, the following:

2.1 Perform full scope of operation and maintenance on equipment which are outside covered units of LTSA. "**Covered Units**" of LTSA is defined in Clause 4.0 below.

2.2 Perform routine maintenance upon, and operate the Covered Units and the Plant using proper type, quantity and quality of lubricants, fuels, water, steam and air which comply with specifications attached with LTSA in accordance with OEM's recommendations and Prudent Utility Practices. "**Routine Maintenance**" is defined in Clause 5.0 below.

2.3 Maintain full, complete and accurate records containing operation of the Covered Units and Plant and the performance of all maintenance undertaken by the O&M Operator. Such records shall comprise a rigorous and explicit operating log (to enable calculation of various parameters defined in the LTSA), logs and printouts of and from the control systems of the Covered Units and Plant, fuel monitoring and sampling records and documentation of all Routine Maintenance and other maintenance performed by O&M Operator. Upon request, provide copy of such records to LTSA Contractor through Owner.

2.4 Provide any labour, including labour supervision and equipment operators that may be required in connection with Owner's obligation under LTSA. O&M Operator shall further render such operator level support as may be reasonably required by LTSA Contractor in the performance of LTSA Contractor's obligations, including but not limited to:

2.4.1 Making the Covered Units available to LTSA Contractor for performance of LTSA Contractor's Covered Maintenance, repair of collateral damage, extra work and remedial warranty obligations;

2.4.2 Taking such measures at the direction of LTSA Contractor as may be appropriate to minimize damage which may result in or from an in-service failure until such time as LTSA Contractor is able to mobilize labour support and other items needed to assess and address the failure;

2.4.3 Directing its instrument technicians to remove and install electrical components and instruments as requested by LTSA Contractor; and

2.4.4 Performing instrument calibrations and applying calibration sticker on instruments.

2.5 Provide cranes, scaffolding (thru external scaffolding agency), heavy lift equipment, special tools supplied with the Covered Units, hand and power tools and instruments, oxy-acetylene welding machines as per requirement of LTSA Contractor for the performance of the services by LTSA Contractor under LTSA and also during boroscopic inspection of Gas Turbines.

2.6 Provide to the LTSA Contractor, compressed air, electric power and all Site utilities in the amounts, pressures, and voltages required to operate the Covered Units and perform covered maintenance (as specified in Clause 3 below), repair of collateral damage and extra work, including adequate lighting for night shift work.

2.7 Provide all decontamination work necessary for the performance of LTSA Contractor's work under LTSA.

2.8 Provide complete and accurate details and documentation to the LTSA Contractor concerning the origin, quality and condition of all parts and materials to be provided by Owner under LTSA.

2.9 Provide to the LTSA Contractor, Fuel, water, steam and air within specifications. Ensure adequate fuel monitoring and testing, including maintenance of Fuel quality records.

2.10 Provide access to LTSA Contractor, with prior approval from Owner, to technical information, equipment manuals and drawings related to the Plant for the use of LTSA Contractor's personnel in connection with the performance of LTSA.

2.11 Provide access to adequate space next to the Covered Units for lay down, inspection and/or repairs of parts and for the performance of LTSA Contractor's services consistent with LTSA.

2.12 Provide to LTSA Contractor adequate weatherproof enclosures.

2.13 Provide adequate firefighting equipment and services for the performance of LTSA Contractor's services consistent with LTSA.

2.14 Ensure de-energization, lock-out/tag-out, and re-energization of equipment in accordance with laws and Prudent Utility Practice so as to protect personnel and allow work to safely proceed.

2.15 Offload, locate and reload LTSA Contractor's test equipment at Site.

2.16 For Gas Turbine combustion inspections, perform calibration of combustion controls i.e., gas control valves, IGVs, bleed heat valves, etc.

2.17 For Gas Turbine hot gas path inspections, upon reconnection of electrical and instrumentation, verify connections, calibrate and perform rotation check including the works mentioned in Clause 2.16 above.

2.18 For Gas Turbine major inspections, inspect inlet systems for corrosion and cracked silencers and perform bleed heat manifold inspection including the works described in Clause 2.17 above.

2.19 Extend all support to and receive directions from LTSA Contractor during Covered Unit outage event.

2.20 Provide weekly log of alarms, changes in control logic parameters, preventive maintenance log, and corrective maintenance log to LTSA Contractor through Owner.

2.21 Provide daily fuel quality reports, monthly vibration analysis, monthly lube oil analysis and twice annual infrared analysis to the LTSA Contractor through Owner.

2.22 Maintain and provide access to LTSA Contractor with prior approval from Owner to Covered Units maintenance management system.

2.23 LTSA Contractor shall be consulted and pre-advised of all planned corrective and preventive maintenance.

2.24 Assist Owner and participate in meeting with LTSA Contractor on request of Owner in advance planning, scheduling and performance of Covered Maintenance including (i) annual planning meetings, and (ii) pre-outage meeting approximately six (6) months prior to the start of each planned Covered Maintenance outage. "**Covered Maintenance**" of LTSA is defined in Clause 3.0 below.

2.25 Assist Owner and participate in meeting with LTSA Contractor on request of Owner in post-outage meeting after the conclusion of each Covered Maintenance outage.

2.26 Cooperate with LTSA Operator to enable him to perform his obligation under LTSA.

3.0 Covered Maintenance to be provided under LTSA for Covered Units has following meaning:

3.1 Periodic inspection of the Covered Unit(s), consisting of some or all of the following work, as LTSA Contractor determines to be necessary in accordance with LTSA:

Sl. No.	Activity	Estimated Planned Maintenance Duration	Estimated Inspection Intervals
A	Combustion Inspection	9 days	8000 FFH
B	Hot Gas path Inspection	13 days	24000 FFH
C	Major Inspection	29 days	48000 FFH

Above specified maintenance duration and inspection intervals are provided for information only and may vary over the Term of the Contract.

3.2 Services for repair, and/or replacement of parts of the Covered Unit(s) other than the Auxiliaries whenever the need arises pursuant to Prudent Utility Practices, including disassembly, installation of parts of Covered Unit(s) and reassembly.

3.3 Provided that Clause 3.1 and Clause 3.2 above shall not include testing (other than dye penetrate test and magnetic particle inspection), repair or replacement of components or parts of the Covered Unit(s) comprising inspect only components, the performance of Routine Maintenance, repair of collateral damage or extra work, or inspection, repair and/or replacement of parts or components needed to assess and repair the effects of an excluded event.

3.4 Following are the inspect only components:

3.4.1 Turbine rotors;

3.4.2 Turbine casings;

3.4.3 Gas Turbine compressor vanes, blades and inlet guide vanes; and

3.4.4 Other Gas Turbine compressor components that can't be removed without removal of the Gas Turbine rotors.

4.0 Covered Units under LTSA consist of the following:

4.1 2 (two) General Electric PG9351FA+e Gas Turbine together with the related General Electric Mark VI, Speedtronic TM Turbine Control System, up to and excluding the terminal points described below and excluding auxiliary systems. The "**Terminal Points**" are the following:

4.1.1 First flanged connections to the turbine casing;

4.1.2 For the turbine control system, the termination strips in the control system cabinets;

4.1.3 Exhaust first expansion joint;

4.1.4 Flanged connection at inlet bellmouth; and

4.1.5 Gas Turbine side flange of the Gas Turbine to generator coupling.

4.2 The following auxiliary equipment up to and excluding the terminal points described below (collectively the "**Auxiliaries**"):

4.2.1 Accessory Module;

4.2.2 Gas Fuel Skid;

4.2.3 Compressor Water Wash Skid;

4.2.4 Interconnection Module;

4.2.5 Process Air Skid;

4.2.6 Nitrogen Skid;

4.2.7 Hydraulic Power Unit;

4.2.8 CO_2 Fire Protection Skid; and

4.2.9 Lube Oil Skid.

4.3 The Terminal Points for each of the Auxiliaries listed in Clause 4.2 above are the points where any of the following connect to the subject auxiliary skid or system, as applicable:

4.3.1 Field run piping (e.g. air, water, hydraulic, fuel, steam, lube oil, etc.);

4.3.2 Field run electrical (e.g. wiring, conduit, conductors, optical fiber, high voltage leads, buss bars, control cables, cable trays, etc.); and

4.3.3 The Terminal Points for each of the Auxiliaries includes every connection point, whether it is piping, tubing, conduit, electrical or otherwise, and every type of connection, whether it is flanged, threaded, welded, bare wire, connector or other. Electrical connections are either loose leads from the subject skid connecting to field run electrical or connections between skid electrical leads and field run electrical within a factory-mounted junction box on the skid, as applicable.

5.0 Routine Maintenance means maintenance of a regular, preventive or minor nature that is performed during Units shutdown or during operation, to maintain the Covered Units and other equipment in good working order on a day-to-day basis, including but not limited to, painting, inspection, lubrication, calibration, adjustment, minor leak repair, provision of fluids, grease and resins, cleaning and replacement of all strainers, cartridges, and filters (including inlet air filters), maintenance or replacement of sensors, fuses, thermocouples, gauges, switches, and light bulbs, removal and installation of operation spares (except as covered in LTSA Contractor's scope), removal and installation of parts for Auxiliaries and other similar preventive, routine or minor work.

ANNEXURE-2

SUMMARY OF GAS SALES AND PURCHASE AGREEMENT

1.0 GSPA signed with Oil and Natural Gas Corporation Limited (ONGC) is valid initially for 15 (fifteen) years further extendable up to 25 (twenty five) years.

2.0 **Sale and Purchase**

2.1 **Gas Sale and Purchase**

2.1.1 With effect from the commercial supply date, the seller agrees to sell and tender for delivery gas at the delivery point and the buyer agrees to purchase, receive and take at the delivery point and pay for gas, in the quantities, at the time and at the prices determined in accordance with and subject to the terms and conditions of this agreement.

2.1.2 Seller has laid a dedicated pipeline network for transportation of gas up to delivery point near buyer's fence.

2.2 **Gas Supply**

2.2.1 The seller would renew/enter into agreement for gas supply to its other existing or new customers only after making a reasonable endeavour to ensure availability of gas resources for meeting the DCQ requirements during the term of this agreement. Subject to this, the seller shall have unequivocal right to sell gas to any customer.

2.3 **Seller's Facilities**

2.3.1 The Seller shall at all relevant times during term own and/or have access to and use of, and maintain and operate or cause to be maintained and operated in accordance with standards at least as good as those of a reasonable and prudent operator, subject to Applicable Laws, the seller's facilities for the performance of its obligations in accordance with this agreement.

2.4 **Transfer of Risk & Title**

2.4.1 Delivery of gas in accordance with this agreement by the seller to the buyer shall be deemed to have been completed and title to and risk of loss in such gas shall pass from the seller to the buyer at the delivery point, free and clear of any and all security interest.

3.0 **Supply of Gas**

3.1.1 Commercial supply of gas for Unit-1 and Unit-2 commenced from 4 January 2014 and 24 March 2015 respectively.

3.1.2 The buyer shall be liable for its TOP payment obligation in accordance with Clause 8, in the event of:

3.1.2.1 the buyer's failure to take such amount of gas as is scheduled for delivery in accordance with this agreement; or

3.1.2.2 any other breach by the buyer of its obligations in accordance with this agreement.

3.1.3 The seller shall be liable for seller's shortfall, in the event of:

3.1.3.1 the seller's failure to tender for delivery gas as is scheduled for delivery in accordance with this agreement; or

3.1.3.2 any other breach by the seller of its obligations in accordance with this agreement.

4.0 **Quantities**

4.1.1 For each contract year there shall be established a daily contract quantity which shall be the quantity of gas which, subject to the provisions of this agreement, the seller shall undertake to sell and tender for delivery to the buyer at the delivery point and the buyer shall undertake to purchase and receive at the delivery point on each day and which shall be equal to **2.65 MMSCMD** of gas computed at a net calorific value of 8,250 kcal/SCM ("**Daily Contract Quantity**" or "**DCQ**"), by reference to which the nominations for offtake by the buyer and for delivery by the seller shall be made in accordance with the procedure outlined under Clause 5.0. In case net calorific value of gas is found to vary by more than 2% for at least 30 consecutive days, DCQ may be adjusted with rounding up to second decimal place of figure in MMSCMD.

5.0 **Nominations & Delivery Rate**

5.1 **Monthly Nomination**

5.1.1 Following the Commercial Supply Date, 7 (Seven) days after the first day of each calendar month during a contract year the buyer shall give the seller an estimate (**"Monthly Nomination"**) of the total aggregate quantity of gas deliveries which the buyer expects to achieve during the immediately succeeding calendar month ("**Monthly Contract Quantities**").

5.2 **Daily Nomination**

5.2.1 Not later than 06:00 hours (six a.m.) on the day immediately preceding each day, starting from the day before the start date, the buyer shall notify to the seller of its good faith nomination of the total quantity and the delivery rate of gas required in respect of the next day which shall be within a range of 90% (ninety percent) to 120% (one hundred and twenty percent) of the applicable DCQ ("**DCQ Tolerance Limits**"). Upon receipt of the daily nomination from the buyer, the seller shall, not later than 09:00 hours (nine a.m.) on the same day, notify the buyer of the total quantities, not greater than the relevant nomination made by the buyer, and the delivery rate of gas that it can supply, within DCQ Tolerance Limits, for the next day, and which shall constitute the applicable nominated quantity for the relevant Day ("**Nominated DCQ**"). The seller shall commence supply of the Nominated DCQ on 06:00 hours (six a.m.) of the next Day. The parties hereby agree that the Nominated DCQ has to be within the DCQ Tolerance Limits.

5.2.2 The aggregate of Nominated DCQ for a month shall be within plus or minus 5% (five percent) of the Monthly Contract Quantity nominated by the buyer, under Clause 5.1, for that month. In a month seller shall not be obliged to accept aggregated Nominated DCQ in excess of 5% (five percent) over the Monthly Contract Quantity.

5.2.3 In the event that the buyer fails to give notice in accordance with this Clause 5.2, the DCQ shall be deemed to be the Nominated DCQ unless the seller notifies the Nominated DCQ, not greater than DCQ, within the DCQ Tolerance Limits thereof.

5.2.4 In the event that the seller fails to notify the buyer of the gas it can supply the next day in accordance with this Clause 7.2, the quantities requested by the buyer shall be deemed to be the Nominated DCQ.

5.3 **Delivery Rate**

5.3.1 The seller shall endeavour to deliver, and the buyer shall endeavour to receive the Nominated DCQ of gas at a uniform rate through the day. Notwithstanding total sales in a day, the hourly offtake rates shall not fluctuate more than plus or minus 10% (ten percent) over the scheduled average supply rate during the day.

6.0 **Quality, Delivery Pressure and Temperature**

6.1.1 The seller shall use reasonable endeavours to ensure that the gas meets the specifications set out in agreement.

6.1.2 The seller shall maintain a pressure of not less than of 15 +/- 1 kg/cm2g ("**Delivery Pressure**") at the delivery point to enable the buyer to take gas at the delivery point.

6.1.3 The seller shall deliver gas to the buyer at delivery point at or about ambient temperature

6.2 **Off Spec Gas**

6.2.1 If gas tendered for delivery at the delivery point in accordance with this agreement fails to comply with the specifications given in the agreement ("**Off Spec Gas**"), the seller shall promptly notify the buyer as soon as reasonably practicable after confirming that gas tendered for delivery is Off Spec Gas. The notice shall give details of the deficiency in meeting the specifications and the anticipated cause and likely duration of the deficiency.

6.2.2 If gas tendered for delivery is Off Spec Gas, the buyer shall have the right to refuse to accept delivery of all such Off-Spec Gas forthwith until gas offered by the seller meets the specifications. Following the refusal of the buyer to accept delivery of Off Spec Gas, such part of Nominated DCQ on any day that the seller is unable to supply shall be included in seller's daily shortfall for that day.

6.2.3 However, in the event that the buyer does not exercise its rights of refusal under Clause 6.4.2 within 3 (three) hours of receipt of notice from the seller under Clause 6.4.1, Off Spec Gas shall be deemed to have been accepted by the buyer, such Off

Spec Gas shall not be deducted from the actual quantity of gas delivered for the relevant day and the buyer shall be obligated to make payments to the seller for such Off Spec Gas.

6.2.4 In the event that Off Spec Gas is delivered by seller and taken by buyer at the delivery point, the seller shall not be liable for any costs and damages incurred by the buyer as the result of such supply of Off Spec Gas and any costs, losses or expenses incurred by the buyer in disposing of Off Spec Gas.

7.0 **Facilities and Planned Maintenance**

7.1 The seller shall construct, maintain and repair, or shall procure the construction maintenance and repair of the seller's facilities and all replacements thereto and operate or procure the operation of the seller's facilities, at all times acting as a reasonable and prudent operator.

7.2 The buyer shall maintain and repair, or shall procure the maintenance and repair of the buyer's facilities and all replacements thereto and operate or procure the operation of the buyer's facilities, at all times acting as a reasonable and prudent operator.

7.3 During the term, the seller and the buyer shall afford each other and their respective authorized representatives, upon reasonable advance notice, reasonable rights of access to inspect the installation, maintenance, operation and repair of the seller's facilities and the buyer's facilities respectively. Provided that, any such inspection shall be made at the risk and cost of the party on whose behalf it is being made. These reasonable rights of access shall also be available to the parties prior to the Commercial Supply Date, in respect of the construction, testing and commissioning of the seller's and buyer's facilities and further testing, if any of the respective facilities.

7.4 **Maintenance and Inspection Coordination**

7.4.1 Both parties shall endeavour to synchronize the planned maintenance of their respective facilities in a contract year. However, seller shall endeavour to coincide the planned maintenance of the seller's facilities with that of buyer's facilities. Any such projected downtime shall reduce, to the extent necessary, the DCQ during the affected period.

7.4.2 The parties shall be relieved of their respective obligations to deliver or receive gas during a planned maintenance period in relation to the seller's facilities or the buyer's facilities, as the case may be, for an aggregate of up to [30 (thirty)] days in a contract year ("**Planned Maintenance**").

7.5 **Unplanned Interruption and Emergency**

7.5.1 Each party shall provide as early as is reasonably practicable in the circumstances, a notice in respect of an unplanned interruption or emergency shutdown of its facilities that prevent giving or accepting delivery of gas in accordance with this agreement. The notice shall also provide the reasons for and the likely duration of such unplanned interruption or emergency shutdown. The need for unplanned interruption

and emergency shutdown shall be determined and executed by either party acting as a reasonable and prudent operator.

7.5.2 Unless such unplanned interruption or emergency shutdown is an event of force majeure in accordance with this agreement, then the party responsible for such unplanned interruption or emergency shall not be released from its obligations.

7.5.3 Pursuant to an unscheduled shutdown, buyer may notify seller of its intention for complete shutdown of gas supplies through the delivery point. In such case, seller shall not only be discharged of its obligation to deliver Nominated DCQ on that Day but shall also be discharged of its obligation following such shutdown to deliver the Nominated DCQ till not more than [12 (twelve)] hours from restart notice by the buyer, so that the seller, acting in accordance with the standards of a reasonable and prudent operator, is able to restore the supplies. Provided, however, the buyer shall not be absolved of its liability to make payment for TOP payment obligations under the GSPA, for the buyer's inability to take Nominated DCQ at the delivery point due to circumstances that do not constitute an event of force majeure.

8.0 Measurements, Tests and Safety

8.1 The Seller shall ensure that the quantity and quality of gas delivered in accordance with this agreement is measured at or immediately prior to delivery point. Such measurement shall be subject to periodic calibration and independent verification in accordance with the provisions of this agreement.

8.2 the volume, temperature, pressure and composition of gas delivered in accordance with this agreement shall be measured at the delivery point by the delivery point measurement equipment and the MMSCM, net calorific value and MMBTU of gas delivered under this agreement shall be calculated by applying the procedures set out as per relevant standards

8.3 The seller shall, at its sole cost, risk and liability, provide and install measurement equipment, including the flow meters and other associated equipment for gas volume measurement at delivery point ("**Delivery Point Measurement Equipment**") which shall meet the technical requirements as per relevant standards specified in agreement. The buyer shall provide the seller with reasonable access to and use of land and utilities inside the boundaries of the buyer's facilities to enable the Seller to cause the installation of the Delivery Point Measurement Equipment.

8.4 Delivery Point Measurement Equipment shall be maintained and operated by seller at its sole expense, risk and liability as a reasonable and prudent operator.

8.5 The buyer may, at its sole cost, risk and liability install and operate its own measurement equipment ("**Buyer's Equipment**") to provide the buyer direct readings and independent confirmation of measurements and tests and which are compatible with the Delivery Point Measurement Equipment.

8.6 The Buyer's Equipment shall not interfere with the use of Delivery Point Measurement Equipment and buyer shall bear all costs and risk for the installation and maintenance of Buyer's Equipment.

8.7 The buyer shall have the right, at its expense and risk, from time to time, upon giving prior written notice of 2 (two) days to the seller, to inspect the Delivery Point Measurement Equipment and the charts and the other measurements or test data of the seller.

8.8 On each day, seller and buyer shall jointly sign a statement ("**Joint Ticket**") showing the measurements of gas volume, pressure, temperature and composition taken by Delivery Point Measurement Equipment the quantities of gas delivered by the seller during the previous day in accordance with this agreement and such Joint Ticket shall be used for the purposes of invoicing and payment. If buyer is unavailable to sign the Joint Ticket, then the Joint Ticket signed by the seller shall be deemed to be the Joint Ticket for the purposes of this Clause.

8.9 **Safety**

8.9.1 Gas transportation by pipeline should be undertaken in compliance with the American Society of Mechanical Engineers (ASME) code B31.8 - Gas Transmission Systems and Distribution Piping. The applicable uniform technical health, environmental and safety standards for hydrocarbon transportation system operations shall be in accordance with the American Society of Mechanical Engineers (ASME) Code 31.8 – Gas Transmission Systems and Distribution Piping as amended from time to time. Their prudent application shall be monitored by the relevant authorities and take into full account the impact of hydrocarbon transportation system operations on the specific characteristics of the entire environment including biosphere, historical and natural heritage, likely to be affected by the hydrocarbon transportation system trajectory.

8.9.2 In addition to the requirement for compliance of the internationally accepted safety standards, each party shall at all times comply with the provisions of the gas safety regulations under the Petroleum Act, 1934 as amended or re-enacted from time to time.

8.9.3 Neither Party shall convey gas into a system, unless it has prepared a safety case, containing the particulars requested by the Parties or specified in any Applicable Law and such safety case has to be accepted and approved by the health and safety authorities.

8.9.4 The safety case is required to cover the arrangement which has to ensure:

8.9.4.1 compliance of health and safety regulations in relation to any installation, maintenance, testing and purging pipes or any equipment which might affect the gas tightness of any part of the system;

8.9.4.2 compliance with the requirements for metering at the delivery point;

8.9.4.3 compliance with the requirement to cooperate with the system emergency coordinator for the purpose of regulations;

8.9.4.4 compliance with the requirements of the regulations with respect to gas escapes and related investigations;

8.9.4.5 compliance with the gas quality requirements set out in the regulations;

8.9.4.6 risk of supply emergency is minimised; and

8.9.4.7 supply emergencies or other incidents, which could endanger persons are adequately dealt with.

ANNEXURE-3

SUMMARY OF POWER PURCHASE AGREEMENTS

1.0 Ministry of Power (Government of India) has allocated 628 MW power from the project to the seven north eastern states and 98 MW power to OTPC for merchant sales. In line with allocation of Power made by the Ministry of Power, the Power Purchase Agreements has been signed by OTPC with seven north eastern states and each of these agreements are valid for a period of 25 (twenty five) years from the commercial operation date of the Plant. Remaining 98 MW power allocated to OTPC for merchant sale is sold to customers directly or at the power exchanges on short/medium/long term basis. The main terms and conditions of the Power Purchase Agreements executed by OTPC with seven north eastern states are set out below.

2.0 **Development of the Project**

2.1 Under this agreement seller is responsible for obtaining and maintaining in full force and effect all consents required pursuant to PPA and Indian law, executing the Project in timely manner, owning the Project throughout the term of the PPA and procuring the electricity for construction, commissioning and start-up.

2.2 Under this agreement procurer is responsible for procuring the interconnection and transmission facilities to enable the power station to be connected to the Grid System, ensuring that seller is provided and electrical connection for construction, commissioning and start-up power, payment of transmission charges, RLDC charges and SLDC charges and making reasonable arrangement for the evacuation of the infirm power.

3.0 **Purchase and Sale of Available Capacity and Scheduled Energy**

3.1 Seller shall sell to the procurer and the procurer shall pay the tariff for all of the available capacity up to the contracted capacity and scheduled energy of the power station, according to their then existing allocated contract capacity, throughout the term of PPA.

3.2 Seller shall sell all available capacity up to the contracted capacity of the power station to all beneficiaries in proportion of each beneficiaries then existing allocated contracted capacity pursuant to Dispatch Instruction.

4.0 **Right to Available Capacity and Scheduled Energy**

4.1 Contracted capacity shall at all times be for the exclusive benefit of the procurer and the procurer shall have the exclusive right to purchase the contracted capacity from the seller. The seller shall not grant to any third party or allow any third party to obtain any entitlement to the available capacity and/or scheduled energy.

4.2 Seller shall be permitted to sell power, being a part of the available capacity of the power station to third parties if there is a part of available capacity which has not been dispatched by the procurer, ordinarily entitled to receive such part.

4.3 The seller shall not itself use any of the electricity generated by the power station during the term of this agreement, except for the purpose of meeting the power station's auxiliary load requirements, as per the norms laid down by the appropriate commission, load requirements of the gas supply arrangements as per applicable law

and if approved by the appropriate commission also for the housing colony for the staff.

5.0 **Construction Documents**

5.1 The seller shall maintain at the Site and make available for inspection to the procurer at all reasonable times copies of the results of all tests specified hereunder.

5.2 **Performance Test**

5.2.1 The performance test shall be conducted under any and all ambient conditions (temperature, humidity, etc.) and any and all Fuel qualities that may exist during the time of the performance test and no corrections in final gross and net output of the Block will be allowed as a result of prevailing ambient conditions or Fuel quality.

5.2.2 The correction curves will only be used if the Grid System operation during the performance test exceeds electrical system limits.

5.2.3 The performance test shall be deemed to have demonstrated the contracted capacity of the Block under all designed conditions and therefore no adjustments shall be made on account of fuel quality or ambient conditions.

5.2.4 The seller shall perform in respect of each Block a performance test, which such Block shall be deemed to have passed if it operates continuously for 72 (seventy two) consecutive hours at or above 95% (ninety five percent) of its contracted capacity, as existing on the effective date and within the electrical system limits and the functional specifications.

5.2.5 For the purposes of any performance test pursuant to this Clause 5.2, the electrical system limits to be achieved shall be as follows:

5.2.5.1 The Block must operate within the voltage levels described in the functional specification for the duration of the performance test. If, during the performance test, voltage tests cannot be performed due to Grid System, data supplied from tests of the generator step-up transformers and generators supplied by the manufacturers shall be used to establish the ability of the Block to operate within the specified voltage limits.

5.2.5.2 The Block shall operate within the Grid System frequency levels described in the functional specification for the duration of the performance test.

5.2.5.3 The Block shall operate within the power factor range described in the functional specification for the duration of the performance test. If, during the performance test, power factor tests cannot be performed due to the Grid System, data supplied from tests of the generators and the generator step-up transformers supplied by the manufacturers shall be used to establish the ability of the Block to operate within the specified power factor range.

5.2.5.4 The Block must operate to its contracted capacity with Fuel quality and water temperature available at the time of testing and no adjustment shall be allowed for any variation in these parameters.

5.2.6 As a part of the performance test, the seller shall demonstrate that the Block meets the functional specifications for ramping rate as mentioned in functional specification. For this purpose, representative samples of ramp rates shall be taken, by ramping up or down the gross turbine load while maintaining the required temperatures and

temperature differences associated with each ramp rate within the turbine while maintaining all other operational parameters within equipment limits.

5.2.7 As a part of the performance test, the Block shall be tested for compliance with parameters of supercritical technology.

5.2.8 Testing and measurement procedures applied during performance test shall be in accordance with codes, practices or procedures as generally/normally applied for the performance tests.

5.2.9 The seller shall comply with the prevalent laws, rules and regulations as applicable

6.0 Synchronization, Commissioning and Commercial Operation

6.1 Synchronization

6.1.1 The seller shall give the procurer and RLDC at least 60 (sixty) days advance preliminary written notice and at least 30 (thirty) days advance final written notice, of the date on which it intends to synchronise a Block to the Grid System.

6.1.2 Subject to Clause 7.1.1, a Block may be synchronised by the seller to the Grid System when it meets all connection conditions prescribed in any Grid Code then in effect and otherwise meets all other Indian legal requirements for synchronisation to the Grid System

6.2 Commissioning

6.2.1 The seller shall be responsible for ensuring that each Block is commissioned in accordance with Clause 5.2 above at its own cost, risk and expense.

6.2.2 The seller shall give the procurer and the independent engineer not less than 10 (ten) days prior written notice of commissioning test of each Block.

6.2.3 The seller, the procurer and the independent engineer (individually) shall each designate qualified and authorised representative to witness and monitor commissioning test of each Block.

6.2.4 Testing and measuring procedures applied during each commissioning test shall be in accordance with the codes, practices and procedures mentioned in Clause 5.2 above of this agreement.

6.2.5 Within 5 (five) days of a commissioning test, the seller shall provide the beneficiaries and the independent engineer with copies of the detailed commissioning test results. Within 5 (five) days of receipt of the commissioning test results, the independent engineer shall provide to the procurer and the seller in writing, his findings from the evaluation of commissioning test results, either in the form of final test certificate certifying the matters specified in Clause 6.3.1 or the reasons for non-issuance of final test certificate.

6.3 Commercial Operation

6.3.1 A Block shall be commissioned on the day after the date when the procurer receives a final test certificate of the independent engineer stating that:

6.3.1.1 the commissioning tests have been carried out in accordance with Clause 5.2 above and are acceptable to him; and

6.3.1.2 the results of the performance test show that the Block's tested capacity, is not less than 95% (ninety five percent) of its contracted capacity, as existing on the effective date.

6.3.2 If a Block fails a commissioning test, the seller may retake the relevant test, within a reasonable period after the end of the previous test, with 3 (three) day's prior written notice to the procurer and the independent engineer. Provided however, the procurer shall have a right to require deferment of any such re-tests for a period not exceeding 15 (fifteen) days, without incurring any liability for such deferment, if the procurer is unable to provide evacuation of power to be generated, due to reasons outside the reasonable control of the procurer or due to inadequate demand in the Grid.

6.3.3 The seller may retake the performance test by giving at least 15 (fifteen) days advance notice in writing to the procurer, up to 8 (eight) times, during a period of 180 (one hundred and eighty) days ("initial performance retest period") from a Block's COD in order to demonstrate an increased tested capacity over and above as provided in Clause 6.3.1.2. Provided however, the procurer shall have a right to require deferment of any such re-tests for a period not exceeding 15 (fifteen) days, without incurring any liability for such deferment, if the procurer is unable to provide evacuation of power to be generated, due to reasons outside the reasonable control of the procurer or due to inadequate demand in the Grid.

6.3.4 If a Block's tested capacity after the most recent performance test mentioned in Clause 6.3.3 has been conducted, is less than its contracted capacity as existing on the effective date, the Block shall be de-rated with the following consequences in each case with effect from the date of completion of such most recent test:

6.3.4.1 the Block's contracted capacity shall be reduced to its tested capacity, as existing at the most recent performance test referred to in Clause 6.3.3 and capacity charges shall be paid with respect to such reduced contracted capacity;

6.3.4.2 the capacity charge (in Rs. /kwh) shall be reduced as determined by CERC, in the event tested capacity is less than 95% (ninety five percent) of its contracted capacity as existing on the effective date;

6.3.4.3 the seller shall not be permitted to declare the available capacity of the Block at a level greater than its tested capacity;

6.3.4.4 the availability factor of the derated Block shall be calculated by reference to the reduced contracted capacity; and

6.3.4.5 the capital cost and each element of the capital structure schedule shall be reduced in proportion to the reduction in the contracted capacity of the power station as a result of that derating (taking into account the contracted capacity of any Block which has yet to be commissioned).

6.3.5 If at the end of initial performance retest period or the date of the eighth performance test mentioned in Clause 6.3.3, whichever is earlier, the tested capacity is less than the contracted capacity as existing on the effective date, the consequences mentioned in Clause 8.2.2 shall apply for a period of one year. Provided that such consequences shall apply with respect to the tested capacity existing at the end of initial performance retest period or the date of the eighth performance test mentioned in Clause 6.3.3, whichever is earlier.

6.3.6 If a Block's tested capacity as at the end of the initial performance retest period or the date of the eighth performance test mentioned in Clause 6.3.3, whichever is earlier, is found to be more than it's contracted capacity as existing on the effective date, the tested capacity shall be deemed to be the Block's contracted capacity if the procurer agrees and intimates the same to the seller within 30 (thirty) days of receipt of the results of the last performance test to purchase such excess tested capacity and also provide to the seller additional letter of credit for payments in respect of such excess tested capacity agreed to be purchased by such procurer. In case the procurer/s decide not to purchase such excess tested capacity, the seller shall be free to sell such excess tested capacity to any third party and the Block's contracted capacity shall remain unchanged, notwithstanding that the tested capacity exceeded the contracted capacity.

Provided that in all the above events, the seller shall be liable to obtain/maintain all the necessary consents (including initial consents), permits and approvals including those required under the environmental laws for generation of such excess tested capacity.

Pertinent to mention that the Plant has been commissioned with commercial operation date for Unit 1 being 4 January 2013 and for Unit 2 being 24 March 2014.

7.0 Operation & Maintenance

7.1 The parties shall comply with the provisions of the Applicable Law including, in particular, Grid Code as amended from time to time regarding operation and maintenance of the power station and all matters incidental thereto. Provided however the seller shall not schedule the maintenance outage of a Block when another Block of the project is shut down or expected to be shut down except under force majeure or when the operation of Block is not permissible due to technical considerations.

8.0 Capacity, Availability and Dispatch

8.1 Repeat Performance Tests

8.1.1 The procurer may from time to time during the operating period, but only if the available capacity has not been 100% (one hundred percent) of the contracted capacity of the commissioned Blocks (excluding the Block(s) under planned outage for capital maintenance in consultation with the regional power committee, if any) even for one continuous period of at least 3 (three) hours during any three continuous months, require the seller to demonstrate a Block's or if all the Blocks have been commissioned, the power station's tested capacity by carrying out a further performance test (a "**Repeat Performance Test**") in accordance with this Clause 8.1. A Repeat Performance Test shall be carried out in accordance with Clause 5.2, save that the test shall last 24 (twenty four) hours instead of 72 (seventy two) hours. Provided that if the tested capacity after such test is less than 100% (one hundred percent) of the contracted capacity as existing on the effective date of the commissioned units, the seller shall also have a right to conduct not more than two (2) Repeat Performance Test within a period 6 (six) months, by giving a notice of not less than 15 (fifteen) days to the procurer for each such test. Provided that the procurer shall have a right to require deferment of each such re-tests for a period not exceeding 5 (five) days, without incurring any liability for such deferment, if the procurer is unable to provide evacuation of power to be generated, due to reasons outside the reasonable control of the procurer or due to inadequate demand in the Grid.

8.1.2 The procurer shall give the seller not less than 7 (seven) days' advance written notice of the time when a Repeat Performance Test of a Block or if all the Blocks have been commissioned of the power station is to begin. A Repeat Performance Test may not be scheduled for any period when the Block to be tested is due to undergo a Scheduled Outage.

8.1.3 Beneficiaries and seller shall jointly appoint the independent engineer to monitor the repeat performance test and to certify the results in accordance with Clause 8.2.

8.1.4 If the seller wishes to take any Block, out of service for repair before a Repeat Performance Test, it shall inform the procurer in writing before its scheduled start of the repairs and the estimated time required to complete the repairs. The parties shall then schedule a maintenance outage in accordance with the Grid Code to enable the seller to carry out those repairs and in such a case, the procurer requiring the Repeat Performance Test, shall defer the Repeat Performance Test until such Block is returned to service following that Maintenance Outage. Provided however the Seller shall not schedule the maintenance outage of a Block when another Block of the project is shut down or expected to be shut down except under force majeure or when the operation of Block is not permissible due to technical considerations.

8.1.5 The procurer requiring the Repeat Performance Test, may jointly, for reasonable cause, defer any Repeat Performance Test for up to 15 (fifteen) days from the date originally notified to the seller in accordance with Clause 8.1.2 if such beneficiaries jointly notify the seller in writing at least 1 (one) day before the Repeat Performance Test starts of the reason for the deferral and when the test is to be rescheduled.

Provided that, such deferment at the joint request of the procurers shall be permitted only once in respect of each of the Repeat Performance Tests.

8.1.6 The seller (individually), the procurer and the independent engineer (individually) shall each have the right to designate qualified and authorised representatives (but not more than three each) to monitor the Repeat Performance Test.

8.1.7 Testing and measurement procedures applied during the Repeat Performance Test shall be in accordance with the codes, practices of procedures as generally/normally applied for the performance tests.

8.1.8 Within 5 (five) days of a Repeat Performance Test, the seller shall provide each of the procurers and the independent engineer with copies of the detailed test results.

8.1.9 Within 1 (one) month of the date by which all the Block have been commissioned, the seller shall conduct a performance test of the power station (hereinafter referred to as "Power Station Performance Test") where after the provisions of Clause 8.2 shall apply. A Power Station Performance Test shall be carried out in accordance with Clause 5.2, save that the test shall last 24 (twenty four) hours instead of 72 (seventy two) hours.

8.2 **Derating**

8.2.1 A Repeat Performance Test shall be concluded when all the beneficiaries receive the final test certificate of the independent engineer stating that the Repeat Performance Test has been carried out satisfactorily in accordance with Clause 5.2 and certified the Block's or if all the Blocks have been commissioned, the power station's then current tested capacity as demonstrated by the results of the Repeat Performance Test.

8.2.2 If a Block's or if all the Blocks have been commissioned, of the power station's then current tested capacity as established by the Repeat Performance Test and the final test certificate issued by the independent engineer, is less than its contracted capacity as existing on the effective date, the seller shall not be permitted to declare the available capacity of the Block or if all the Blocks have been commissioned, of the power station's at a level greater than its tested capacity, in which case:

8.2.2.1 the Block's or if all the Block have been commissioned, of the power station's contracted capacity shall be reduced to its most recent tested capacity and capacity charges shall be paid with respect to such reduced contracted capacity.

8.2.2.2 Further, the capacity charge shall be reduced as determined by CERC.

8.2.2.3 the availability factor of the de-rated Block or if all the Units have been commissioned, of the power stations shall be calculated by reference to the reduced contracted capacity, and:

8.2.2.4 the capital cost and each element of the capital structure schedule shall be reduced in proportion to the reduction in the contracted capacity of the power station as a result of that derating taking into account the contracted capacity of any Block which has yet to be commissioned;

8.2.3 The consequences mentioned in Clause 8.2.2 above shall apply from the completion date of each Repeat Performance Test. If at the end of second Repeat Performance Test conducted by the seller or the last date of the end of the 6 (six) month period referred to in Clause 8.1.1, whichever is earlier, the tested capacity is less than the contracted capacity as existing on the effective date, the consequences mentioned in Clause 8.2.2 shall apply for a period of at least one year after which the seller shall have the right to undertake a Repeat Performance Test. Provided that such consequences shall apply with respect to the tested capacity existing at the end of second Repeat Performance Test conducted by the seller or the last date of the end of the six month period referred to in Clause 8.1.1, whichever is earlier

8.2.4 If the independent engineer certifies that it is unable to give a final test certificate because events or circumstances beyond the seller's reasonable control have prevented the Repeat Performance Test from being carried out in accordance with Clause 5.2, the procurers shall reschedule a Repeat Performance Test as soon as reasonably practicable.

8.2.5 If a Block's or if all the Units have been commissioned, of the power station's tested capacity is found to be more than its contracted capacity, the provisions of Clause 6.3.6 shall apply mutatis mutandis.

8.3 Availability

8.3.1 The seller shall comply with the provisions of the Applicable Law regarding availability including, in particular, to the provisions of the ABT and Grid Code relating to intimation of availability and the matters incidental thereto.

8.4 Dispatch

8.4.1 The seller shall comply with the provisions of the Applicable Law regarding Dispatch Instructions, in particular, to the provisions of the ABT and Grid Code relating to dispatch and the matters incidental thereto.

9.0 Metering and Energy Accounting

9.1 For installation of meters, meter testing, meter calibration and meter reading and all matters incidental thereto, the seller and the procurers shall follow and be bound by the Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006, the Grid Code and ABT as amended and revised from time to time. In addition, the seller shall also allow and facilitate CTU in installation of one set of required main and standby special energy meters for accurate recording of energy supplied by seller. For these CTU meters (110V, 1A, 4-wire), the seller shall provide the required connection from EHV current transformers/bushing CTs/voltage transformers/CVTs on EHV side of all generator-transformers, station transformers and outgoing lines, of meter accuracy of 0.2 class or better. The seller may install any further meters for its own comfort at its own cost.

9.2 All scheduling and RLDC/SLDC charges applicable shall be borne by the procurer.

9.3 Tariff for the sale of contracted capacity or any part thereof shall be as determined by the CERC from the COD of the first Block,

9.4 Sale of electrical output by the seller prior to the Commercial Operation Date ("Infirm Power") of the Block shall be governed by the CERC Tariff Regulations. The quantum of Infirm Power generated by Units synchronized but not have been put on COD shall be computed from the energy accounting and audit meters installed at the power station as per Central Electricity Authority (installation and operation of meters) Regulations, 2006 as amended from time to time.

9.5 Following events shall constitute sellers' event of default:

9.5.1 if at any time following a Block being commissioned and during its retest, as per clause 8, such Blocks' Tested Capacity is less than 92% (ninety two percent) of its contracted capacity, as existing on the effective date, and such tested capacity remains below 92% (ninety two percent) even for a period of 3 (three) months thereafter; or

9.5.2 after Commercial Operation Date of all the Blocks of the power station, the seller fails to achieve average availability of 50% (fifty percent), for a period of 12 (twelve) consecutive months or within a non-consecutive period of 12 (twelve) months within any continuous aggregate period of thirty 36 (six) months; or

10.0 **Availability Factors**

10.1 The following matters shall be determined as per the provisions of the applicable regulation of CERC and Grid Code and this Clause may be amended from time to time as per applicable regulation of CERC and Grid Code:

10.1.1 Availability declaration and calculation of availability or availability factor;

10.1.2 Requirement for spinning reserves;

10.1.3 Procedure for revision of availability;

10.1.4 Consequences of failure to demonstrate capacity or mis-declarations of capacity; and

10.1.5 Other matters which may be related to availability or availability factor.

11.0 **Tariff**

11.1 The method of determination of tariff payments for any contract year during the term of agreement shall be in accordance with CERC Terms and Conditions of Tariff Regulations as notified by CERC from time to time and shall be as approved by CERC from time to time.

11.2 Monthly capacity charge, contract year energy incentive payment, and contract year penalty for availability below normative availability during contract year shall be as per CERC Terms and Conditions of Tariff Regulations prevailing from time to time

11.3 Variation between scheduled energy and actual energy at the delivery point shall be accounted for through Unscheduled Interchange (UI) Charges as detailed in the Grid Code and ABT

11.4 The payment of transmission/wheeling charges shall be settled between the CTU/STU and the procurer. The payment of scheduling charges to the respective nodal agency (RLDC or SLDC) shall be the responsibility of the procurer.

11.5 In case seller has to pay penalty to the Fuel Supplier for not purchasing the minimum guaranteed quantity of Fuel mentioned in the Fuel supply agreement and if during that contract year availability of the commissioned Blocks is greater than the minimum offtake guarantee but the procurer have not scheduled energy corresponding to such minimum off-take guarantee during that contract year, then seller will raise an invoice, on the procurer, in proportion to the difference between scheduled energy assuming offtake corresponding to minimum offtake guarantee and scheduled energy (as applicable to the procurer) for the penalty paid to the Fuel Supplier under the Fuel supply agreement in that contract year, along with documentary proof for payment of such penalty

Provided, within 10 (ten) days of the end of each month after the COD of the first Block, the seller shall provide a statement to all the procurers, providing a comparison of the cumulative dispatch for all previous months during the contract year with the minimum offtake guarantee of the procurers. Further, such statement shall also list out the deficit, if any, in the Fuel offtake under the Fuel supply agreement, due to cumulative dispatch being less than the Minimum offtake guarantee. In case of a Fuel offtake deficit, within a period of 15 (fifteen) days from the date of receipt of the above statement from the seller and after giving a prior written notice of atleast 7 (seven) days to the seller and all the other procurers, the concerned procurer(s) shall have the right to avail themselves such deficit at the same price at which such deficit fuel was available to the seller under the Fuel supply agreement and to sell such deficit to third parties. Such right of procurers with regard to deficit fuel shall be in proportion to their respective shortfall in minimum offtake guarantee.

ANNEXURE-4

LIST OF INSTRUMENTS TO BE PROVIDED BY O&M OPERATOR

ANNEXURE-5

LIST OF WORKSHOPS, CHEMICAL LAB, INSTRUMENT LAB AND ELECTRICAL LAB EQUIPMENT AND INSTRUMENTS AVAILABLE WITH OWNER

Sl. No.	Description	Total Quantity	
		Unit	Value
A	**CHEMICAL LAB EQUIPMENT**		
A.1	VISCOMETER	No	1
A.2	PH METER MAINS OPERATED(EUTECH)	No	2
A.3	PH METER PORTABLE	No	1
A.4	CONDUCTIVITY METER MAINS OPERATED	No	1
A.5	CONDUCTIVITY METER PORTABLE	No	1
A.6	FURNACE	No	1
A.7	UV-VIS SPECTROPHOTOMETER	No	1
A.8	FLASH POINT APPARATUS	No	1
A.9	EXPLOSIMETER LEL detector	No	1
A.10	GAS CHROMATOGRAPH – to be commissioned	No	1
A.11	CENTRIFUGE	Nos	1
A.12	DISSOLVED OXYGEN METER	No	1
A.13	TURBIDITY METER	No	1
A.14	WATER BATH	No	1
A.15	MAGNETIC STIRRER CUM HOT PLATE	No	1
A.16	ANALYTICAL BALANCE	No	1
A.17	ROUGH BALANCE	No	1
A.18	TITRIMETER (KF APPARATUS)	No	1
A.19	JAR TEST APPARATUS	Nos	1
A.20	FREEZER	Nos	1
A.21	ORSAT APPARATUS	No	1
A.22	VACCUM PUMP	No	1
A.23	PORTABLE WATER ANALYSIS KIT - to be commissioned	No	1
A.24	FURNITURE	Lot	1
A.25	FUME HOOD – to be installed	Nos	1
A.26	GLASSWARE & POLYTHENEWARE	Lot	1
A.27	REAGENT & CONSUMABLE	Lot	1
A.28	COMPUTER (1 for Chemist use, 01 for Spectrophotometer, 01 for Gas Chromatography, all with UPS)	Nos	3
A.29	PRINTER	Nos	1
A.30	CALCULATOR – to be provided	No	2
A.31	SAFETY EQUIPMENT	Lot	1
A.32	FIRST AID	Lot	1

Sl	Description	Total Quantity	
		Unit	Value
B	**ELECTRICAL LAB EQUIPMENT**		
B.1	EARTH TESTER Type: Portable with Four terminals	Nos	1
B.2	Multimeter Type: Portable, Digital	Nos	2
B.3	Clip-On-Ammeter CF & Type: AC having ins. Strength of 650V & 2kv/min	Nos	2
B.4	Oil Testing Set Type: Portable	Nos	1
B.5	Portable Kelvin Bridge Type: +/-.05% accuracy least count.0.2 micro ohm	Nos	1
B.6	High Voltage Testing Set Testing Set (Portable) Type: AC & DC	Nos	1
B.7	Portable Distance Relay Test Set	Nos	1
B.8	Portable Secondary Injection Test Kit Type: Mains operated	Nos	1
B.9	Loading Transformer	Nos	1
B.10	Wire Gauge	Nos	1
B.11	Portable 1 ph. Primary Injection Test Set with Current	Nos	1
B.12	Auto Transformer (1ph)	Nos	1
B.13	Auto Transformer (3ph)	Nos	1
B.14	RHEOSTAT 660V, 10A, 25 Ohm	Nos	1
B.15	RHEOSTAT 660V, 5A, 50 Ohm	Nos	1
B.16	RHEOSTAT 660V, 2.5A, 100 Ohm	Nos	1
B.17	RHEOSTAT 660V, 1A, 250 Ohm	Nos	1
B.18	RHEOSTAT 660V, 0.5 A, 500 Ohm	Nos	1
B.19	RHEOSTAT 660V, 0.25A, 1000 Ohm	Nos	1
B.20	RHEOSTAT 660V, 0.1 A, 2500 Ohm	Nos	1
B.21	Portable HT Metering Kit	Nos	1
B.22	3 ph Test Bench	Nos	1
B.23	Potential Transformer Test Kit	Nos	1
B.24	Conductivity Bridge	Nos	1
B.25	Micrometer	Nos	1
B.26	Mercury in Glass Thermometer	Nos	1
B.27	Hand operated crimping Tool	Nos	1
B.28	Stabilized DC Power Supply	Nos	1
B.29	Soldering Iron	Nos	1
B.30	Multimeter (Analog)	Nos	2
B.31	Ammeter	Nos	1
B.32	Ammeter	Nos	1

Sl	Description	Total Quantity	
		Unit	Value
B.33	VOLTMETER	Nos	1
B.34	VOLTMETER	Nos	1
B.35	Phase sequence indicator	Nos	1
B.36	Frequency Meter	Nos	1
B.37	Rotating Substandard meter	Nos	1
B.38	Digital Tachometer	Nos	1
B.39	Timer	Nos	1
B.40	Micro ohmmeter (DUCTOR)	Nos	1
B.41	OSCILLOGRAPH	Nos	1
B.42	Portable Kelvin Bridge	Nos	1
B.43	OIL Filter machine 1 KL	Nos	1
B.44	Transformer Buchholz Gas Analyzer	Nos	1
B.45	Ten Delta Test kit with accessories	Set	1
B.46	Secondary injection set	Set	1
B.47	Cable fault locator with accessories	Set	1
B.48	SF6 handling set with accessories	Set	1
B.49	Oil filtration machine 6 Kl	Set	1

Sl	Description	Total Quantity	
		Unit	Value
C	**WORKSHOP EQUIPMENT**		
C.1	Pedestal Drill (Dia in steel -16mm)	No	1
C.2	Pedestal Drill (Dia in steel -19mm)	No	1
C.3	Pedestal Drill (Dia in steel -23mm)	No	1
C.4	Grinder	No	1
C.5	Rough Grinding Machine	No	1
C.6	Surface Grinding Machine	No	1
C.7	Universal Grinding Machine	No	1
C.8	Milling machine	No	1
C.9	Redial Drilling Machine	No	1
C.10	Metal cutting Hacksaw	No	1
C.11	Lathe (SOB-500mm, DBC-1000mm)	Nos	2
C.12	Lathe (SOB-500mm, DBC-1500mm)	No	1
C.13	Plate guilotine and hole puncher	No	1
C.14	Portable drill guns	No	1
C.15	Tool and cutter grinder	No	1
C.16	Tool Grinder	No	1
C.17	Hand operated plate shears	No	1
C.18	Plate shears (On pedestal	No	1
C.19	Work Benches	Nos	6
C.20	Fitter vice	Nos	6
C.21	Corrugating rollers	No	1
C.22	Marking -off table	No	1
C.23	Oxy- acetylene profile cutter without gas cylinders	No	1
C.24	Furnace annealing (Electric)	No	1

Sl	Description	Total Quantity	
		Unit	Value
C.25	Oxy- acetylene cutter and welder without gas cylinders	Nos	2
C.26	Electric welding sets-on operator	Nos	2
C.27	Argon arc welding sets	Nos	2
C.28	Welding tables	Nos	3
C.29	Soldering irons	Nos	4
C.30	Portable screens	No	1
C.31	Shaper (stroke 610 mm)	No	1
C.32	Set of sign writing equipment and stencils	No	1
C.33	Portable compressor and compressed air spraying equipment	No	1
C.34	Portable sanding machine	No	1
C.35	Thread cutting machine	No	1
C.36	Hydraulic Press	No	1
C.37	Coil winding machine	No	1
C.38	Electric drying oven	No	1
C.39	Brazing Hearth	No	1
C.40	Welding machine	No	3
C.41	Gas cutting set	No	4
C.42	HRSG Hydro testing machine (400 bar)	No	1
C.43	Stress relieving machine (SR)	No	1

Sl	Description	Total Quantity	
		Unit	Value
DD	**C&I LAB EQUIPMENT**		
DD.1	HART COMMUNICATOR 375	Nos	1
DD.2	HART COMMUNICATOR 475	Nos	1
DD.3	DRY WELL CALIBRATOR	Nos	1
DD.4	TRUE RMS MULTIMETER	Nos	3
DD.5	DEAD WEIGHT TESTER	Nos	1
DD.6	REGULATED POWER SUPPLY	Nos	1
DD.7	DIGITAL RTD SIMULATOR	Nos	1
DD.8	DIGITAL PH/MV SIMULATOR	Nos	1
DD.9	DIGITAL STOP WATCH	Nos	1
DD.10	ANALOG STOP WATCH	Nos	1
DD.11	PORTABLE PRESSURE CALIBRATOR	Nos	1
DD.12	SIGNAL GENERATOR	Nos	1

Sl	Description	Total Quantity	
		Unit	Value
DD.13	DIGITAL THERMOMETER	Nos	3
DD.14	HAND HELD TACHOMETER	Nos	1
DD.15	VOLTAGE & CURRENT SIMULATOR(SOURCE)	Nos	1
DD.16	TEMPERATURE BATH (RANGE 0-600 DEG C)	Nos	1
DD.17	TEMPERATURE BATH (RANGE 0-300 DEG C)	Nos	1
DD.18	BENTLY NEVADA PROXIMITY SYSTEM TEST KIT (TK 3e)	Nos	2

ANNEXURE-6

LIST OF SPECIAL TOOLS & TACKLES AVAILABLE WITH OWNER

Sl.No	Mat.Desc	Quantity	UOM	Net.Wt(KG
	Gas TURBINE FR 9FA -TOOLS & TACKLES			
A	**TOOL KIT, NOZZLE REMOV STG -1 -106L1351G002**			
A.1	DOWEL PULLER ASSLY	1	EA	
A.2	DOWEL PULLER ASSLY	1	EA	
A.3	DOWEL PULLER ASSLY	1	EA	
A.4	DOWEL PULLER ASSLY	4	EA	
A.5	PUMP, DOWEL PULLER	1	EA	
A.6	BOX, TOOL KIT, NOZZLE REMOV	1	EA	
B	**TOOL KIT - 106L 1971G035**			
B.1	TUBE CONN, MALE	1	EA	
B.2	TUBE CONN, MALE	1	EA	
B.3	BOLT, EYE	1	EA	
B.4	BOLT, EYE	1	EA	
B.5	PIN. LOCATING COMB CASE	4	EA	
B.6	PIN. LOCATING COMB CASE	4	EA	
B.7	ORIFICE PLATE KIT	1	EA	
B.8	ORIFICE PLATE KIT	1	EA	
C	**STATION TOOL KIT - 107L2726G001**			
C.1	TENSIONER, HYDRAULIC	1	EA	
C.2	TENSIONER, HYDRAULIC	1	EA	
C.3	HYDRAULIC WRENCHES	1	EA	
C.4	HYDRAULIC WRENCHES	1	EA	
D	**ORIFICE PLATE KIT - 360A 7263G028**			
D.1	ORIFICE PLATE	18	EA	
D.2	ORIFICE PLATE	19	EA	
D.3	ORIFICE PLATE	20	EA	
D.4	ORIFICE PLATE	21	EA	
D.5	ORIFICE PLATE	22	EA	
D.6	ORIFICE PLATE	23	EA	
D.7	ORIFICE PLATE	24	EA	
D.8	ORIFICE PLATE	25	EA	
D.9	GASKET	144	EA	
D.10	GASKET	72	EA	
D.11	GASKET, SPIRAL WOUND	72	EA	
D.12	NUT SLFLKG	36	EA	
D.13	NUT SLFLKG	36	EA	
D.14	ALY STL 12PT SCREW	36	EA	
D.15	ALY STL 12PT SCREW	36	EA	
E	**FIXTURE, LINR REMOVAL-COM - 103E3723G003**			
E.1	B4A26A001.00T 021.06	21		
E.2	B4A26A001.00T 021.06	21		

Sl.No	Mat.Desc	Quantity	UOM	Net.Wt(KG
E.3	B4A26A000.37T 006.25	3		
E.4	B4A26A000.37T 006.25	3		
E.5	SCREW, WEIVEL END	3		
E.6	SCREW, WEIVEL END	3		
F	**TOOL KIT, MAJOR DISASSY - 106L 134G017**			
F.1	PIN, GUIDE CASING	4	EA	
F.2	PIN, GUIDE CASING	4	EA	
F.3	PIN, GUIDE CASING	6	EA	
F.4	PIN, GUIDE CASING	6	EA	
F.5	PIN, GUIDE CASING	4	EA	
F.6	PIN, GUIDE CASING	4	EA	
F.7	PIN, GUIDE CASING	6	EA	
F.8	PIN, GUIDE CASING	6	EA	
F.9	PIN, GUIDE CASING	2	EA	
F.10	PIN, GUIDE CASING	2	EA	
F.11	PIN, GUIDE CASING	2	EA	
F.12	PIN, GUIDE CASING	2	EA	
F.13	TOOL KIT, NOZ REMOV STG1	1	EA	
F.14	TOOL KIT, NOZ REMOV STG1	1	EA	
F.15	TOOL KIT, ROTOR JACKING	1	EA	
F.16	TOOL KIT, ROTOR JACKING	1	EA	
F.17	FIXTURE, LINR REMOVAL-COMB	1	EA	
F.18	FIXTURE, LINR REMOVAL-COMB	1	EA	
F.19	DOLLEY, NOZZLE	1	EA	
F.20	DOLLEY, NOZZLE	1	EA	
G	**TOOL KIT, ROTOR JACKING - 106L 1350G003**			
G.1	BOLT	1	EA	
G.2	RING, JACKING ROTOR	1	EA	
G.3	PUMP, CYLINDER HYDRAULIC			
H	**ROTOR LIFTING BEAMS**			
H.1	BEAM, LIFT-ROTOR ASM 9FA	1	EA	
H.2	BEAM, LIFT-ROTOR ASM 9FA	1	EA	
I	**Gas TURBINE FR 9FA -TOOLS & TACKLES SUPPLIED BY BHEL HYDERABAD**			
I.1	TOOLS SET TURB INSTALLATION 9 FA	1	EA	200
I.2	ROTOR STAND FOR FR 9 FA	2	EA	
I	**Gas TURBINE FR 9FA - OTHER SPECIAL TOOLS**			
I.3	ITH TOOL KIT	1	SET	
I.4	RIVERHAWK TOOL KIT	1	SET	
I.5	HYTORC TOOL KIT	1	SET	
J	**STEAM TURBINE TOOLS & TACKLES**			
J.1	INSPECTION SHAFT ASSEMBLY (HP & LP)	1	SET	1,250.00
J.2	CAP FOR ASSEMBLY	1	EA	56.8
J.3	HOLDER	1	EA	5.2
J.4	SCRU HEX M16X45-8.8	4	EA	0.404
J.5	SCRU HEX M10X35-8.8	3	EA	0.096

Sl.No	Mat.Desc	Quantity	UOM	Net.Wt(KG
J.6	SCRU GRB SOC C P M 4X6-12.9	6	EA	0.006
J.7	MALE CONNR, SS316A,1/2"NPT-M, CL6000B48	2	EA	0.6
J.8	TEE SS 1/2" CL 3000 NPT ENDS	2	EA	1.04
J.9	PRGG SS 0 TO 6 KG/SQCM D63 1/2"NPT-M	2	EA	1
J.10	EXT THRDD FUNNEL G 1/4"	4	EA	0.004
J.11	RBR HOSE BRDD TEXTILE RNFCD NB6 3 07MP	4	M	4
J.12	HOSE CLIP, WORM DRIVE, STEEL, SIZE12 WITH	4	EA	4
J.13	MANIFOLD, 2VLV 1/2"NPT-F CL3000 SS BODY	2	EA	1.6
J.14	COUPLING	2	EA	0.5
J.15	CLAMPINE PIECE	3	EA	0.15
J.16	STRAP	6	EA	0.36
J.17	SCRU SLT CHS A P M5X25-4.8	9	EA	0.036
J.18	NUT HEX GR. A M5 P8 IS1364	9	EA	0.009
J.19	WASHER SPRING SC B 5-ST	9	EA	0.009
J.20	PIPE SS 12.7 X 2.1 A312 TP321	0.12	M	0.067
J.21	MICROMETER INTERNAL STICK/TUBUTYPE 5	1	EA	0.001
J.22	VERNIER DEPTH GAUGE HOOK TYPE SS 0.02 M	1	EA	0.001
J.23	VULCANISED RUBBER SHEET 6 MM	4.174	KG	65.114
J.24	COMPANY MONOGRAM A 60	1	EA	0.022
J.25	SCRU SLT CSK A P M 3X8-4.8	4	EA	0.004
J.26	MOUTH PIECE SIZE 5	2	EA	0.2
J.27	PLUG M27 X 2	1	EA	0.1
J.28	PIPE ASSY	1	EA	0.4
J.29	SUPPORT BUSH	1	EA	0.3
J.30	SEAL NUT	1	EA	0.09
J.31	SEALING WASHER	1	EA	0.02
J.32	MEASURING SLEEVE	1	EA	0.17
J.33	PUSH PIECE	1	EA	0.04
J.34	MOUTH PIECE SIZE 6	2	EA	0.2
J.35	PIPE L=550	1	EA	0.7
J.36	PIPE L=800	1	EA	1
J.37	SUPPORT BUSH	1	EA	0.65
J.38	SEAL NUT	1	EA	0.2
J.39	SEALING WASHER	1	EA	0.07
J.40	MEASURING SLEEVE	1	EA	0.25
J.41	PUSH PIECE	1	EA	0.06
J.42	MIXTURE BOX	1	EA	1.2
J.43	SLEEVE	1	EA	1.3
J.44	MOUTH PIECE SIZE 6	2	EA	0.2
J.45	WASHER DIA 46/30.5 X 2	1	EA	0.4
J.46	SHEET	1	EA	0.002
J.47	SCRU GRB SOC C P M 4X6-12.9	3	EA	0.003
J.48	MALE CONNR, SS316A,1/2"NPT-M, CL6000B48	1	EA	0.3
J.49	TEE SS 1/2" CL 3000 NPT ENDS	1	EA	0.52
J.50	PRGG SS 0 TO 6 KG/SQCM D63 1/2"NPT-M	1	EA	0.5
J.51	EXT THRDD FUNNEL G 1/4"	2	EA	0.002
J.52	RBR HOSE BRDD TEXTILE RNFCD NB6.3 0.7MP	4	M	4

Sl.No	Mat.Desc	Quantity	UOM	Net.Wt(KG
J.53	HOSE CLIP, WORM DRIVE, STEEL, SIZE12 WITH	2	EA	2
J.54	MANIFOLD, 2VLV 1/2"NPT-F CL3000 SS BODY	1	EA	0.8
J.55	COUPLING	3	EA	0.75
J.56	PLUG M30 X 2	1	EA	0.1
J.57	PIPE 26.7 X 3.9 X 700	1	EA	1.5
J.58	SUPPORT BUSH	1	EA	0.5
J.59	SEAL NUT	1	EA	0.2
J.60	SEALING WASHER	1	EA	0.04
J.61	MICROMETER INTERNAL STICK/TUBUTYPE 5	1	EA	0.001
J.62	MEASURING SLEEVE	1	EA	0.35
J.63	VERNIER DEPTH GAUGE HOOK TYPE SS 0.02 M	1	EA	0.001
J.64	PUSH PIECE	1	EA	0.08
J.65	VULCANISED RUBBER SHEET 6 MM	6.26	KG	97.656
J.66	COMPANY MONOGRAM A 60	1	EA	0.022
J.67	SCRU SLT CSK A P M 3X8-4.8	4	EA	0.004
J.68	WOODEN BOX	1	EA	5
J.69	LP SHAFT SUPPORT	1	SET	1,250.00
J.70	FLANGE	2	EA	152
J.71	RING TRDL SELG STATIC ID40 THK 3	2	EA	0.002
J.72	RING TRDL SELG STATIC ID52 THK 3	4	EA	0.004
J.73	SCRU HEX M16X70-8.8	4	EA	0.556
J.74	NUT HEX P M16 P8 ELEGAL	2	EA	0.066
J.75	WASHER MCD 17-ST	8	EA	0.088
J.76	FLANGE	4	EA	40
J.77	RING TRDL SELG STATIC ID50 THK 3	2	EA	0.002
J.78	RING TRDL SELG STATIC ID52 THK 3	2	EA	0.002
J.79	SCRU HEX M16X70-8.8	2	EA	0.278
J.80	NUT HEX P M16 P8 ELEGAL	2	EA	0.066
J.81	WASHER MCD 17-ST	16	EA	0.176
J.82	BLIND FLANGE	2	EA	2.4
J.83	WASHER SEALING 33X39X2	4	EA	0.004
J.84	STEAM BLOWING DEVICE FOR MS PIPES	2	EA	220
J.85	STEAM BLOWING DEVICE FOR HRH PIPE	2	EA	478
J.86	ASSEMBLY TOOLS (TURBINE)	1	SET	575
J.87	SCRU HEX M24X50-8.8	20	EA	5.58
J.88	FLANGE	1	EA	10
J.89	RING TRDL SELG STATIC ID40 THK 3	1	EA	0.001
J.90	RING TRDL SELG STATIC ID80 THK 3	1	EA	0.002
J.91	SCRU HEX M16X70-8.8	1	EA	0.139
J.92	NUT HEX P M16 P8 ELEGAL	1	EA	0.033
J.93	WASHER MCD 17-ST	4	EA	0.044
J.94	BLIND FLANGE	1	EA	1.2
J.95	WASHER SEALING 33X39X2	1	EA	0.001
J.96	LIFTING DEV. FOR LP SHAFT SEALING CASING	1	SET	148
J.97	STEAM BLOWING DEVICE FOR LP INJ VALVE	1	EA	40
J.98	ASSLY. DEVICE FOR LP SHAFT SEAL COMP	1	SET	0.1
J.99	DEV. FOR AXIAL ADJUSTMENT OF LP ROTOR	1	SET	0.05
J.100	SUPPORT	2	EA	18
J.101	SUPPORT	2	EA	18

Sl.No	Mat.Desc	Quantity	UOM	Net.Wt(KG
J.102	SUPPORT	4	EA	14
J.103	SUPPORT	4	EA	12
J.104	SUPPORT	4	EA	22.6
J.105	SUPPORT	4	EA	23.68
J.106	SUPPORT	2	EA	10.6
J.107	SUPPORT	2	EA	10.6
J.108	ANGLE	2	EA	14.6
J.109	ANGLE	2	EA	7.192
J.110	SQUARE NUT M16	21	EA	2.1
J.111	ANGLE	2	EA	8.4
J.112	ANGLE	2	EA	6.124
J.113	ANGLE CS 65X65X6,4*230.00MM	5.336	KG	5.336
J.114	ANGLE CS 65X65X6,2*1700.00MM	19.72	KG	19.72
J.115	ANGLE CS 65X65X6,2*1480.00MM	17.168	KG	17.168
J.116	ANGLE CS 65X65X6,4*950.00MM	22.04	KG	22.04
J.117	LUG	20	EA	30
J.118	ANGLE	4	EA	4.8
J.119	NUT HEX P M16-8	48	EA	1.632
J.120	WASHER	24	EA	1.44
J.121	LOCK WASHER 13	56	EA	0.56
J.122	SCRU HEX M12X30P8.8GAL	56	EA	2.296
J.123	SCR HEX GR. A M16X40-P 8.8 IS1364	24	EA	2.208
J.124	WASHER TAB 17	24	EA	0.216
J.125	LOCK WASHER 13	56	EA	0.56
J.126	ANGLE CS 65X65X6,4*70.00MM	1.624	KG	1.624
J.127	ANGLE CS 65X65X6,8*100.00MM	4.64	KG	4.64
J.128	PLT CS 8,64*15.00*20.00MM	1.216	KG	1.216
J.129	FLOOR GRILL	4	EA	220
J.130	FLOOR GRILL	8	EA	568
J.131	PLT CS 5,20*30.00*1250.00MM	29.44	KG	29.44
J.132	FRAME	1	EA	80
J.133	GUIDE RAIL	1	EA	14
J.134	BUSH	1	EA	6.4
J.135	BOLT M30 X 340/140	4	EA	6.4
J.136	NUT HEX P M30-8	4	EA	0.924
J.137	LOAD SHACKLE KUN 693.10-M24	1	EA	1.23
J.138	COVER	1	EA	150
J.139	STUD M30 X 105	2	EA	1.24
J.140	NUT HEX P M30-8	2	EA	0.462
J.141	EYE BOLT CS M16 COL DIA 35 EYE ID 35 CP	1	EA	0.5
J.142	ROD	1	EA	245
J.143	SCREW HEX, M36X180	1	EA	1.7
J.144	EYE BOLT CS M36 COL DIA 75 EYE ID 70 CP	1	EA	3.8
J.145	FIXTURE FOR HAND BARRING DEVICE	1	SET	19
J.146	MOUNTING FRAME FOR BRG.SHELL DIA 500	1	SET	60.6
J.147	MOUNTING FRAME FOR BRG. SHELL (DIA 400	1	SET	55
J.148	SHAFT LIFTING DEVICE K TURB REAR	1	SET	194
J.149	SHAFT LIFTING DEVICE LP REAR	1	SET	309
J.150	HP-IP SHAFT SUPPORT	1	SET	36.72
J.151	SPECIAL TOOLS (GOVERNING)	1	SET	504
J.152	LIFTING BEAM	1	SET	3,300.00
J.153	LIFTING BEAM	1	SET	1,550.00

Sl.No	Mat.Desc	Quantity	UOM	Net.Wt(KG
J.154	WIRE ROPE SLING GALV ROPEDIA40 SLING12	2	EA	20
J.155	WOOLFELT SH 6,2*1600.00*150.00MM	0.518	KG	0.518
J.156	SHAFT LIFTING DEVICE (LP FRONT)	1	SET	309
K	**ST GENERATOR TOOLS & TACKLES**			
K.1	SKID PLATE	1	EA	28
K.2	SKID SHOE	2	EA	34
K.3	SLIDE PEDESTAL	1	EA	160
K.4	BLOCK UNDER JOURNAL	1	EA	75
K.5	BLOCK UNDER BARREL	2	EA	400
K.6	,2*1000.00*2000.00MM	32	KG	32
L	**ST GENERATOR ERECTION TOOLS**			
L.1	ADAPTOR PLATE	1	EA	55
L.2	BOLT HEX M30X150-8.8	6	EA	6.258
L.3	WASHER	6	EA	2.28
L.4	SCRU CAP SOC P M20X60-12.9	6	EA	1.17
L.5	BOLT HEX M20X60 P8.8 CAD PL	4	EA	0.828
L.6	WASHER MCD 21-ST	4	EA	0.068
L.7	HYDRAULIC JACK 25 TONNES CAPACITY	2	EA	50
L.8	AIR GUIDE RING FIXTURE ASSEMBLY	1	EA	125
M	**GAS BOOSTER COMPRESSOR TOOLS & TACKLES**			
M.1	CLEARANCE CHECK FIXTURE FOR ROTOR	2	EA	100
M.2	SUPPORT FRAME FOR DIAPHR (400 SERIES)	4	EA	200
M.3	DIAPHR ASSY & DISASY FIXTURE	KG	1	EA
M.4	HYD RATCH TORQ WRENCH +ACC (1080-1031	1	SET	25
M.5	HYD POWER CONS INCL ACC FOR HRT WRENC	1	SET	30
M.6	HI. PR.OIL INJECT.PUMP ASSY.INCL.PR.GUAG	1	SET	12
M.7	COUPL HUB ASY&DISASY FIXTUR FOR HUB D>	1	EA	25
M.8	TOOL KIT FOR IT	1	EA	60
M.9	LIFTING SCREW M42X3	4	EA	14
M.10	BOLT HEX BM20X200-4.6	6	EA	3.306
M.11	SPANNER WITH TWO TEETH	1	EA	0.7
M.12	FIXTURE FOR COLLAR ASSY.&DIS.ASSY.	1	EA	43
M.13	FLOATING RING	11	EA	10
M.14	SPANNER WITH TWO TEETH	1	EA	1.021
M.15	EXTRACTOR M8	2	EA	0.35
M.16	GUIDE STUD M48X3	4	EA	40
N	**BOILER FEED PUMP TOOLS & TACKLES**			
N.1	SUPPORT PLATE-FK6D30 CARTG ASSY TOOLS	1	EA	101.5
N.2	TIE ROD-FK6D30 CARTG ASSY TOOLS	4	EA	8.8
N.3	SPACER-FK6D30 CARTG ASSY TOOLS	4	EA	1.28
N.4	LIFTING LUG(SHAFT)-FK6D30 CART ASSY TOO	1	EA	2.3
N.5	BOLT HEX.GR.C M42 X 200-P 4.6	2	EA	5.54
N.6	WASHER MCD 43-ST	2	EA	0.036
N.7	NUT HEX B M42X3-4	2	EA	1.312

Sl.No	Mat.Desc	Quantity	UOM	Net.Wt(KG
N.8	NUT HEX P M20-8	8	EA	0.512
N.9	LOCATING HUB NUT(NDE)-FK6D30 CARTG TO	1	EA	2.2
N.10	LOCATING HUB NUT(DE)-FK6D30 CARTG TOO	1	EA	2.2
N.11	LIFTING PAD ASSY-FK6D30 CARTG TOOLS	1	EA	7
N.12	LOCATING HUB (NDE)ASSY-FK6D30 CART TOO	1	EA	7
N.13	LOCATING HUB (DE)ASSY-FK6D30 CART TOOL	1	EA	12
N.14	C SPANNER VAR-01	1	EA	1
N.15	C SPANNER VAR NO 02	1	EA	1
N.16	C SPANNER VAR NO 03	1	EA	1
N.17	C SPANNER VAR NO 04	1	EA	2
N.18	JACKING SCREW VAR.NO.01	2	EA	0.22
N.19	JACKING SCREW VAR.NO.02	2	EA	1.02
N.20	JACKING SCREW VAR.NO.03	2	EA	1.2
N.21	EXTRCTN ROD (SEAL ABUTMENT) -FK6D30 TO	2	EA	0.076
N.22	SUPPORT ROD-FK6D30 TOOLS	2	EA	1.8
N.23	STRONG BACK-TH CLR WITHDL GEAR FK6D30	1	EA	0.765
N.24	JACKING PLATE-TH CLR WITHDL GEAR FK6D30	1	EA	0.02
N.25	SCRU HEX M16X80-8.8	1	EA	0.155
N.26	STUD B P M6X60-8.8	3	EA	0.039
N.27	NUT HEX P M 6-8	3	EA	0.009
N.28	STUD-BAL DRUM WITHDWL GEAR ARGMT-FK	2	EA	2.2
N.29	STRONG BACK-BAL DRUM WITHDWL GEAR-F	1	EA	5.6
N.30	NUT HEX P M16-8	2	EA	0.068
N.31	SPANNER ASSY FOR COUP NUT-FK6D30 TOOL	1	EA	1.3
N.32	SPANNER ASSY FOR BP COUPLING NUT	1	EA	1.5
N.33	PEG SPANNER ASSLY-FK6D30 TOOLS	1	EA	1.605
N.34	HYDRAULIC STUD TENSIONER.	1	EA	40
N.35	WHEEL STOP-FK6D30 CART WITHDWL GEAR	2	EA	3.14
N.36	PLT CS 25,2*175.00*200.00MM	13.738	KG	13.738
N.37	CART WHEEL ASSY BRACKET-FK6D30	1	EA	43
N.38	LIFTING LUG-FK6D30 CART WITHDWL GEAR	1	EA	6.5
N.39	LUG LIFTING NUT-FK6D30 CART WITHDWL GE	4	EA	1.76
N.40	LOCKING STUD-FK6D30 CART WITHDWL GEA	1	EA	0.36
N.41	BOLT HEX M20X65-8.8	4	EA	0.884
N.42	SCRU CAP SOC P M12X25-12.9	2	EA	0.072
N.43	SCRU HEX M16X50 GAL	24	EA	2.592
N.44	SCRU HEX M16X70-8.8	6	EA	0.834
N.45	SCRU HEX M20X45-8.8	4	EA	0.668
N.46	SCRU HEX M24X45-8.8	2	EA	0.528
N.47	SCRU HEX M24X55-8.8	2	EA	0.59
N.48	JACKING SCREW VAR.NO.04	4	EA	1.24
N.49	JACKING SCREW VAR.NO.05	1	EA	0.38
N.50	JACKING SCREW VAR.NO.07	2	EA	2.4
N.51	NUT HEX P M16-8	12	EA	0.408
N.52	NUT HEX P M20-8	4	EA	0.256
N.53	EYE BOLT CS M12 COL DIA 30 EYE ID 30 CP	7	EA	2.8

Sl.No	Mat.Desc	Quantity	UOM	Net.Wt(KG
N.54	EYE BOLT CS M24 COL DIA 50 EYE ID 50 CP	1	EA	1.2
N.55	WASHER TAPER CHN 26 ST	2	EA	0 284
N.56	SUPRT RAIL ASSY-FK6D30 CART WITHDWL GE	1	EA	126
N.57	SUPRT ROLR ASSY-FK6D30 CART WITHDWL G	1	EA	24.5
N.58	CRADLE RLR ASSY-FK6D30 CART WITHDWL G	2	EA	20
N.59	EXTN SLV INNER-FK6D30 CART WITHDWL GEA	1	EA	33.5
N.60	EXTN SLV OUTER-FK6D30 CART WITHDWL GE	3	EA	78
N.61	EXT SLV LAST STG-FK6D30 CART WITHDL GEA	1	EA	37
N.62	SUPRT JACK ASSY-FK6D30 CART WITHDWL GE	1	EA	33
N.63	TENSIONING JACK-FK6D30 CART WITHDWL G	2	EA	1
O	**CONDENSATE EXTRACTION PUMP TOOLS & TACKLES**			
O.1	1ST STAGE IMP WITHDRAWAL & FITTING ASS	1	EA	45.37
O.2	INT STAGE IMP WITHDRAWAL & FITTING ASS	1	EA	25.17
O.3	COUP & TH CLR WITHDRAWAL & FITTING ASS	1	EA	9.72
O.4	SPANNER	1	EA	5.5
O.5	C SPANNER VAR NO 05	1	EA	0.5
O.6	C SPANNER VAR.NO.09 ASSLY	1	EA	2
P	**COOLING WATER PUMP TOOLS & TACKLES**			
P.1	STRONG BACK	1	EA	19.8
P.2	TIE ROD VAR -01	2	EA	2
P.3	TIE ROD SHAFT CWP FORSPL.TOOLS	2	EA	5.34
P.4	`C` SPANNER	1	EA	4.9
P.5	`C` SPANNER	1	EA	5.9
P.6	`C` SPANNER	1	EA	4.7
P.7	`C` SPANNER	1	EA	7.2
P.8	SUPPORT BEAM	2	EA	460
P.9	STRONG BACK (FOR COUPLING)	1	EA	21.47

Special Tools and Tackles for DCS (1 Set)

Sl	Description	Total Quantity	
		Unit	Value
Q	**maxDNA systems (SG / TG / STN C& I)**		
Q.1	1/4" Nut Driver, full hollow shaft	nos.	2
Q.2	3/18" Nut Driver, full hollow shaft	nos.	2
Q.3	Ground Mat Kit	nos.	3
Q.4	AC Polarity Tester	nos.	1
Q.5	Crimp Tool for RJ Connector	nos.	1
Q.6	Crimp Tool for mosaic modules	nos.	2
Q.7	Digital Multimeter	nos.	2
Q.8	Clamp meter for current measurement	nos.	2
Q.9	Cage Clamp tools	set	1
	DVR-SEE (for 1 DVRs)		
Q.10	Digital Multimeter	nos.	1
Q.11	Continuity Test meter	nos.	1
Q.12	Wire Wound Variable Resistor	nos.	1
Q.13	Wire Stripper	nos.	1
Q.14	Soldering & Desoldering Tool	nos.	1
Q.15	Dual Channel Storage CRO	nos.	1
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TOOLS AND TACKLES FOR GAS TURBINE GENERATORS			
SL.NO.	**DESCRIPTION**	**QTY**	**UNIT**
	DEVICE FOR ROTOR INSERTION		
R	**ROTOR INSERTION INTO STATOR**		
R.1	SKID SHOE	2	NO
R.2	SLIDING PEDESTAL ASSY.	1	NO
R.3	GUIDE PULLEY FOR ROTOR INSERT.	1	NO
R.4	PRESS BOARD 3X770X1150	6	NO
R.5	BOARD	30	NO
R.6	HEMP ROPE DIA 5, L=3M	60	NO
R.7	SUPPORT BLOCK	12	NO
R.8	TIE ROD	6	NO
R.9	OIL SERVO GEM2	3.5	KG
R.10	NUT HEX C-4, M30	8	NO
R.11	WASHER PNCHD, A-ST 33	8	NO
R.12	CHANNEL ISMC 100X50	4	NO
R.13	BASE PLATE WELDING	4	NO
R.14	ROLLER TROLLEY 15 TONNES	12	NO
R.15	BOLT HEX A-8.8 M12X50	72	NO
R.16	SUPPORT BLOCK	1	NO
R.17	SUPPORT BLOCK	1	NO
R.18	PULLING MACHINE 8 TONNES	1	NO
R.19	ENDLESS WIRE ROPE GVD D42 L17M	1	NO
R.20	GRATES FOR ROTOR LIFTING	2	NO
R.21	TIE ROD	4	NO
R.22	EYE BOLT COLLARED M12	4	NO
R.23	EYE NUT M36	2	NO
R.24	DEE SHACKLE GR30 4 SWLT	2	NO
R.25	CU SHEET 2X200X750	1	NO
S	**BRACKET FOR LOWERNG END SHIELD**		
S.1	SUPPORT BRACKET	4	NO
S.2	SCRU CAP SOC A-12.9 M36X120	12	NO
S.3	NUT HEX B-8 M36	12	NO
S.4	WASHER- MCD ST37	12	NO
S.5	EYE BOLT COLLARED M12	4	NO
	ERECTION DEVICES FOR GAS TURBINE GENERATOR		
T	**MOUNTING OF S. SEAL & BRG.SHELL**		
T.1	CROSS BEAM FOR OIL CATCHER(LR)	1	NO
T.2	SCRU HEX A-4.8 M24X70	2	NO
T.3	SCRU HEX A-4.8 M20X60	2	NO

T.4	SCRU HEX A-8.8 M16X50	2	NO
T.5	WASHER MCD-ST 17	2	NO
T.6	SHEET WASHER	1	NO
T.7	CROSS BEAM FOR SEAL BODY	1	NO
T.8	ASSEMBLY LOCK	1	NO
T.9	JOINT	1	NO
T.10	JOINT	1	NO
T.11	JOINT	1	NO
T.12	JOINT	1	NO
T.13	BOLT HEX A-8.8 M24X110	2	NO
T.14	NUT HEX B-8 M24	2	NO
T.15	BOLT HEX A-8.8 M24X200	2	NO
T.16	WASHER	2	NO
T.17	CROSS BEAM FOR BEARING SHELL	1	NO
T.18	SCRU HEX A-8.8 M16X75	2	NO
T.19	EYE BOLT COLLARED M20	2	NO
T.20	MOUNTING RING	1	NO
U	**BEARING OIL PURGING**		
U.1	PIPE ASSEMBLY	1	NO
U.2	SCRU HEX A-8.8 M20X40	2	NO
U.3	WASHER MCD-ST 21	2	NO
U.4	GASKET	1	NO
V	**BEARING OIL PURGING**		
V.1	PIPE ASSEMBLY	1	NO
V.2	SCRU HEX A-8.8 M20X40	2	NO
V.3	WASHER MCD-ST 21	2	NO
V.4	GASKET	1	NO
W	**SLING CHECK BEARING**		
W.1	SLING CHECK BEARING	1	NO
X	**GENERATOR ALIGNMENT DEVICE**		
X.1	HYDRAULIC PUMP	2	NO
X.2	HYDRAULIC JACK	4	NO
X.3	VALVE COUPLING HALF VKH-II	4	NO
X.4	VALVE COUPLING HALF VKH-I	4	NO
X.5	SUPER PRESSURE HOSE	2	NO
X.6	SUPER PRESSURE HOSE	2	NO
X.7	SUPER PRESSURE HOSE	2	NO
X.8	OIL DISTRIBUTOR	2	NO
X.9	USIT RING	12	NO
X.10	USIT RING	4	NO

X.11	SPARE PARTS BAG	4	NO
X.12	FILLER PIECE	4	NO
Y	**SPECIAL TOOLS & TACKLES**		
Y.1	SOCKET	1	NO
Y.2	SOCKET	1	NO
Y.3	EXTENSION-8.5"	1	NO
Y.4	EXTENSION-17"	1	NO
Y.5	SLIDING T-HANDLE	1	NO
Y.6	EYE BOLT COLLARED M36	4	NO
Y.7	EYE BOLT COLLARED M24	2	NO
Y.8	EYE BOLT COLLARED M12	2	NO
Y.9	EYE BOLT COLLARED M20	2	NO
Y.10	WRENCH	1	NO
Y.11	WRENCH	1	NO
Y.12	PIN SPANNER	3	NO
Y.13	MOUNTING RING	1	NO
Y.14	MANUAL LEVER PRESS	1	NO
Y.15	GUIDE BOLT	2	NO
Y.16	ROUND DIA 10, L=250	1	NO
Y.17	SCREW HEX SET GR.4.8 M20X120	2	NO
Y.18	THREADED BOLT	2	NO
Y.19	TORQUE WRENCH	1	NO
Y.20	WRENCH	1	NO
Y.21	WRENCH	1	NO
Y.22	SCRU GRB SOC APM 5X8-12.9	2	NO
Y.23	PIN SPANNER	1	NO
Z	**BRACKET FOR SEAL BODY**		
Z.1	BRACKET FOR SEAL BODY	1	NO
AA	**MOUNTING BRACKET**		
AA.1	MOUNTING BRACKET-UPPER SECTION	1	NO
AA.2	MOUNTING BRACKET-LOWER SECTION	1	NO
AA.3	PLATE	2	NO
AA.4	SCRU HEX A-8.8 M16X55	6	NO
AA.5	NUT HEX A-8 M16	6	NO
BB	**BRACKET FOR OIL CATCHER(INNER)**		
BB.1	BRACKET ASSY.	1	NO
BB.2	SCRU CAP SOC A12.9 M10X60	2	NO
BB.3	NUT HEX A-8 M10	2	NO
BB.4	WASHER MCD-ST 10.5	2	NO

CC	**WIRE ROPES FOR ROTOR INSERTION INTO STATOR**		
CC.1	ENDLESS WIRE ROPE GVD D42 L17M	1	NO

ANNEXURE-7

Sl. No.	List of activities to be performed by Owner during shutdown of Unit-1 and Unit-2 scheduled between January 2021 and March 2021 and excluded form the scope of work of O&M Contractor
1	Hiring of service engineer for servicing of CO2 system of GT and ST of Unit-1 and Unit-2
2	Engagement of certified scaffolder's team including tools, PPE, safety tag
3	Hiring of agency for inspection and replacement of bolts of diffuser of gas turbine of Unit - 1 and Unit-2 (TIL 2204)
4	Hiring of agency for repair of insulation of diffuser, flex seal, GVM etc.
5	Hiring of service engineer for annual testing and servicing of safety valves
6	Hiring of service engineer for overhauling of safety valves as per requirement
7	Hiring of agency for repair of insulation of HRSG- inside, power cycle piping, drums, bunch piping etc.
8	Hiring of agency for valves lapping, overhauling, door seal replacement etc. of Unit-1 and Unit-2 (as per requirement)
9	Hiring of NDT agency for performing UT and RT as per requirement
10	Hiring of agency for overhauling of GBC-2
11	Hiring of service engineer for removal and fixing of mechanical seal in GBC-2
12	Hiring of service engineer for overhauling of hydraulic couplings - 2A & 2B of Unit - 2
13	Hiring of agency for overhauling of HPBFP-2A and HPBFP-2B of Unit- 2
14	Hiring of agency for overhauling of CEP-2A, and CEP-2B of Unit- 2
15	Hiring of service engineer for overhauling of IP bypass valves & LP bypass valve of Unit-1 (IP Bypass valve- 01 no.), Unit-2 (IP Bypass valve- 02 nos., LP Bypass valve- 01 no.)
16	Hiring of service engineer for Alignment check and correction of steam turbine of Unit-2
17	Hiring of agency for insulation repair/ replacement in HIP turbine - top & bottom casing (if required) of Unit-2
18	Hiring of service engineer for overhauling of vacuum pump-2A of Unit- 2
19	Hiring of agency for overhauling of CW Pump- 1A and 1B, (Unit-1) 2A, and 2C of Unit-2
20	Hiring of service engineer for Tube thickness measurement of HRSG of Unit - 1 and Unit-2
21	Hiring of service engineer for inspection and correction of hanger of Unit - 1 and Unit-2
22	Arranging gas cylinders (Argon, Oxygen, DA, LPG, and Nitrogen) for above listed work.
23	Hiring of agency for GTG-2 Rotor replacement and Major Inspection of GTG-2

Sl. No.	List of activities to be performed by Owner during shutdown of Unit-1 and Unit-2 scheduled between January 2021 and March 2021 and excluded form the scope of work of O&M Contractor
24	Hiring of agency for Major inspection of ST Generator of Unit-2
25	Hiring of service engineer for Maintenance & PSS tuning of DAVR of Unit-1 and Unit-2
26	Hiring of service engineer for Relay testing of MICOM 345,MICOM 127,MICOM 633, MICOM 442,MICOM 437- Total 34 nos.
27	Hiring of service engineer for main UPS maintenance of Unit-1 and Unit-2
28	Hiring of service engineer for servicing of 400 KV SF6 main and tie-breaker ICT-1
29	Hiring of service engineer for online harmonic testing of 400 / 132 KV lighting arrestor
30	Hiring of service engineer for testing of 400KV CT-48 nos.,400KV CVT-36 nos. ,132 KV CT-21,nos, 132 KV CVT-24 nos., and Generator transformer HV bushing of both Units – 12 nos.[of Switchyard and all four Generator Transformers0
31	Hiring of service engineer for annual inspection of HBL power system battery charger of Unit - 1 and Unit-2
32	Hiring of service engineer for annual inspection of CHABI power system battery charger of Unit - 1 and Unit-2
33	Hiring of service engineer for replacement of TAP Changer in UAT of Unit-2
34	Hiring of service engineer for Y PHASE bushing leakage arrest, MOG replacement and oil circulation pump replacement in GTGT of Unit-1
35	Hiring of service engineer for servicing of 50 MT crane
36	Hiring of hot air blower for GTG of Unit - 1 and Unit-2
37	Hiring of service engineer for repair of defective MOVS of Unit - 1
38	Hiring of agency for uninstallation and re-installation of actuators of governing valve of steam turbine of Unit-1 and Unit-2.
39	Hiring of agency for uninstallation and re-installation of actuators of IP-LP Bypass valve of steam turbine of Unit- 1 and Unit-2 .
40	Hiring of service Engineer for testing of TSI (Turbine supervisory Instruments) System of steam turbine of Unit-2
41	Hiring of service engineer for testing of earth pit resistance of all control system including DCS, PLC etc. in Plant