# TALWANDI SABO POWER LIMITED

**Tender Specification No: TN/CM/TSPL/2017-18**

BIDDING DOCUMENT AND TECHNICAL SPECIFICATIONS

For

## OPERATIONS & MAINTENANCE CONTRACT

For

TALWANDI SABO POWER LIMITED (OWNER)

1980 MW SUPERCRITICALTHERMAL POWER PLANT

(3 X 660 MW)

AT VILLAGE BANWALA, DISTT. MANSA,

PUNJAB, INDIA

**30th MAY 2017**

*This is a bidding document, subject to amendments (if required)

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## 1. INTRODUCTION - QUALIFYING REQUIREMENTS & EVALUATION CRITERIA

TALWANDI SABO POWER LIMITED, is a company incorporated under the Companies Act 1956 and having its registered office at Village Banwala, Distt. Mansa, Punjab (hereinafter referred to as the "**Owner**" which expression shall unless repugnant to the subject or the context thereof mean and include its successors and permitted assigns), owning a 1980 MW (3 x 660 MW) power station known as Talwandi Sabo Power Limited at Village Banwala, Distt. Mansa, Punjab ("**Plant**", as further defined herein), and

Talwandi Sabo Power Limited (TSPL) a subsidiary of Vedanta Resources Limited, was incorporated as an SPV by Punjab State Electricity Board (PSEB) with the purpose of constructing a 1980 MW (3x660) Super critical thermal power plant at Village Banawala, Mansa-Talwandi Sabo Road, District Mansa, Punjab, India. The project is based on the Tariff Based Competitive Bidding Process (Case-2) on BOO basis for supply of 100% power to Punjab State Electricity Board (PSEB) for 25 years as per the guidelines of Government of India. Power Purchase Agreement is signed with PSEB and Linkage Coal is available. The station is fully commissioned and operational since Sep'2017.
The EPC contractor was M/s. SEPCO-I, China. Total engineering, supply, erection, testing and commissioning of the power plant were in the scope of the EPC contractor.

Plant is connected through Railways. Facilities such as Railway Package, Ash handling (Wet Ash beyond bottom Ash), Raw-water reservoir, Zero Discharge system, Ash Dyke was constructed by owner. TSPL had employed M/s DCPL as technical consultant for the whole power plant.

The O&M Operator is required to provide services, commencing from the takeover of Plant for a period of at least 5 years (can be extended on mutual agreement for further two years). It is required that the successful Bidder depute its staff and technicians in each of the disciplines (Mechanical, Electrical, C&I and BOP and Main plant Operation, CHP, Railways, Environment management facilities etc including local operation etc.,) along with the Plant Manager is deputed at site from the date of takeover for fulfilling the requirements of TSPL Plant operation requirements as per PPA (refer Annexure J) with PSPCL.

The salient features of the 3x660 MW super Critical Power Plant are as below:

| | | |
|---|---|---|
| 1 | Primary Fuel | Non-coking Coal |
| 2 | Source of Coal | Domestic Coal (MCL/CIL), Imported (as & when required) |
| 3 | Start-up Fuel | LDO / HFO/HSD |
| 4 | Water Source | From Punjab Canal Network through Jagga Canal which is almost 5 KM from plant |
| 5 | Pulverizing System | Ball and tube mill |
| 6 | Boiler | Super Critical, Pulverised fuel, Natural circulation with superheater and Reheater |
| 7 | Steam Turbine | Three cylinder, with Reheat and regenerative cycle & Nozzle and throttle governed turbine |

| | | |
|---|---|---|
| 8 | Turbo Generator | Water cooled stator and hydrogen Cooled rotor, Direct Coupled Generator with static excitation |
| 9 | Switch Yard & Evacuation system | 400 kV Switch yard connected to PSPCL grid through 6 evacuating lines and SCADA control System |

The power from the TSPL is to be supplied 100% to PSPCL as per PPA already existing.

As mentioned in this document Contractors are required to adhere to the instructions and guidelines. Any queries on the document should be received within one (1) week of receipt of the document. Bidders may visit the site at their convenience, if not done already.

This document is issued to only those Bidders who fulfill the following criteria: -

- Relevant experience of complete O&M of Coal fired Thermal Power Station of similar capacity.
- Agency must have capability to operate plants in India.
- The financial capability of the agency :- Minimum Annual Turnover>100 Cr (last three FY)
- Bidders having long term interest in carrying out such type of work in India.
- Bidders should have capability & experience of Plant & performance engineering experience of large size units

TSPL reserves the right to accept or reject any or all of the proposals without assigning any reason whatsoever. Issue of the document doesn't qualify the bidder for consideration of bid by the Owner.

All the three units & power station is already commissioned. Station COD had already been performed and accepted by PSPCL on 8th September 2016.

| | |
|---|---|
| Unit 1 COD Date | 25th Aug 2016 |
| Unit 2 COD Date | 05th July 2014 |
| Unit 3 COD Date | 25th Nov 2015 |
| Station COD Date | 08th Sept 2016 |

O&M Operators shall note that the Owner may appoint representatives who will be providing inputs for several matters including but not limited to following, regarding the Power Plant.

## 1.1 INSTRUCTIONS TO BIDDERS

A declaration signed by the Bidder should be submitted along with the offer as a token of acceptance of TSPL's terms and conditions. If any Bidder is unable to accept any particular term(s) of the Bid, or propose any deviation there from, except vital terms mentioned in Bid, then they shall enclose along with their offer a statement of deviations clearly spelling out the deletions/ deviations proposed, which may, however, have an impact on the evaluation of his offer by TSPL, in case these deviations are considered acceptable by TSPL. In the absence of details of deviations to Bid terms, it will be deemed as unqualified acceptance by the Bidder of all terms and conditions contained herein.

1.1.1 **PRICE:** Bidder shall quote Charges in the appended Format at Annexure G. If there is any discrepancy between the figures and written words, the lower of the two shall be taken as the quoted price.

1.1.2 TSPL reserves the right to reject any bids received or accept a bid either for the total scope of work or part thereof or to divide the scope of work on more than one Bidder or negotiate with any Bidder for order without assigning any reason thereof, and no claim shall be entertained in this respect. In case of non- acceptance of bid by TSPL for any reason whatsoever, the Bidder shall have no claim for the expenses incurred by him in submitting his Bid or on any other account. It shall not be obligatory for TSPL to accept the lowest or any Bid; and no Bidder shall be entitled to demand any explanation for the cause of rejection of his Bid. Such decisions by TSPL shall bear no liability whatsoever consequent upon such decisions and TSPL reserves its exclusive right to ignore all such demands.

1.1.3 The Bid shall be signed by anyone, legally authorized to enter into commitments on behalf of the Bidder. Bidder shall submit Power of Attorney in favour of the person who is authorized to enter into commitments on behalf of Bidder.

1.1.4 TSPL will not be bound by any Power of Attorney granted by the Bidder or changes in the composition of the firm made subsequent to submission of the offer or award of the contract. TSPL may, however, recognize such power of attorney and changes after obtaining proper legal advice, the cost of which will be chargeable to the Bidder.

1.1.5 The cancellation of any documents such as Power of Attorney, Partnership Deed etc. should be communicated by the Bidder to TSPL in writing well in time, failing which it shall have no responsibility or liability for any action taken by it or the strength of the said documents.

1.1.6 All direct and indirect costs for preparation of the offer (including clarification meetings), shall be to Bidder's account and TSPL shall bear no liability whatsoever on such costs and expenses.

1.1.7 You shall make your own interpretation of any and all information provided in the Bid documents. TSPL shall not be responsible for the accuracy or completeness of such information and/ or interpretation. You shall be responsible for obtaining and verifying all necessary data and information.

1.1.8 You shall make your own interpretation of any and all information provided in the Bid documents. TSPL shall not be responsible for the accuracy or completeness of such information and/ or interpretation. You shall be responsible for obtaining and verifying all necessary data and information.

1.1.9 BIDDER'S PERFORMANCE: In addition to other requirements specified elsewhere in this Bid document, the Bidder should necessarily furnish the following to evaluate their performance for participating in this Bid. Full details supported with documentary evidence; wherever required, should be furnished.

A. Name & Addresses:

i. The address in full (including Registered Office, and all branches wherever located, giving telephone, telex and fax numbers; names of the Senior Executives of the respective offices should also be given).

ii. Name and addresses of all the Associate/Sister/ Affiliate/Agent Companies wherever located.

B. Past & Current Orders: Details of work similar to that mentioned in this bid document during past 3 years and orders currently under execution

i. Name & address along with Telephone/Fax numbers and name of contact person.

ii. Copy of Orders (un-priced)

iii. Completion period (Schedule v/s Actual).

iv. Performance reports mentioning specific achievements

C. Bidder shall furnish the details of personnel associated with it along with qualification and experience. Bidder shall attach plan as to how it will carry out the work envisaged in this bid document.

D. If required, TSPL team may inspect works where Bidder has rendered or has been rendering similar services for verification/assessment

E. **Annual Reports**: Published Annual Reports of the Bidder for the last three years.

F. **Creditworthiness:** Name and address of the Bidder's bankers and solvency certificate from First Class Bank of the country.

1.1.10 The Bidder shall keep the offer open for acceptance by TSPL for a minimum period of 90 days within which period the Bidder shall have no right to withdraw, revoke or cancel his offer or vary the offer given or any term thereof.

1.1.11 The Bidder shall submit the proposal in three (3) sets (One original and two copies) with one soft copy on a compact disc (CD) along with the originally signed copy of the Declaration Notice no later than 15th June 2017 to

Attention:-
**Head Commercial**
**Talwandi Sabo Power Limited**
Mansa Talwandi Sabo Road
Village Banawala
Distt. Mansa (Punjab)
Phone 01659-248034

The bid shall be submitted in two separate sealed covers
Envelope No. 1 shall contain

a. Originally signed copy of the declaration notice

b. Bidder’s organization chart including the competency details for complete O & M work for the Plant as per the scope in this agreement.

c. Bidders technical/commercial proposal for providing tools and tackles, mobile crane, carrier facility, work shop facilities, testing equipment for electrical, mechanical, instrumentation and environmental engineering facilities etc. at his cost over and above that supplied by the Contractors for fulfilling his obligation as per TSPL's O&M requirement.

d. O&M Bidders guarantee in respect of gross and net output, auxiliary power consumption and heat rate, minor and major maintenance, in line with O&M Operator's guarantees with specified supply of spare parts, during normal operation of plant.

e. Bidders declaration i.e. price bid includes charges towards man power for operation and maintenance of the plant lubricating oils, greases, chemicals, consumables, replacement spares, replacement tools and tackles etc. required for efficient operation of the plant. For this, the Bidder shall furnish a copy of unpriced price schedule identifying the items and terms and conditions but without actually showing the quoted prices.

f. Envelope No. 2 containing the following: -

Price schedule, duly filled up in the prescribed Proforma (Annexure G).

1.1.12 The bids, complete in all respects should be received within 1 weeks (no later than June 15th, 2017) after the receipt of the Tender Documents.

1.1.13 Evaluation Criteria

The bid will be evaluated on the basis of the following criteria: -

a. Bidders quality of technical/commercial offer for providing O&M services.

b. Bidder's price proposal.

The technical/ commercial bids, contained in envelope No. 1 will be opened first. Envelope No. 2 containing price bid will be opened only after bringing technical/commercial offers at par after receiptof written clarifications/ discussions.

## 1.2 DEFINITIONS AND INTERPRETATIONS

The following terms shall have the meanings specified in this Section.

a. "**Abandonment**" means the substantial cessation of the operation and maintenance of any or all of the Plant or any other Services, which cessation is not excused under this O&M Agreement and continues for a period of one (1) day i.e. 24 continuous hours.

b. "**Additional Services**" means those additional services and responsibilities of the Operator during the Term, other than the Services specifically described in Section 6.1 to Section 6.21 and elsewhere in this Document, Services which are reasonably incidental to such Services on the assumption that such Services are performed in accordance with Prudent Utility Practices, which are within the general scope of services provided for, and which are reasonably requested by the Owner in writing; provided, that in the Operator's reasonable judgment it is able and qualified to perform such additional

services and doing so will not impair its ability to perform all of its other responsibilities hereunder; and, provided, further, that the Operator shall only be reimbursed for costs and expenses actually incurred or paid by the Operator in connection with the Operator providing such Additional Services and only if it is determined, by mutual agreement or by Dispute resolution, that such Additional Services cannot reasonably be performed by employees, agents or Sub-Contractors of the Operator without interference with their existing duties.

c. "**Annual Operating Plan**" means the approved annual operating and maintenance plans and assumptions described in or required under Section 6.11.

d. "**Annual Plant Load Factor**" means in relation to a period of 365 days the ratio, expressed as a percentage of the Gross Generation over the Rated Capacity (expressed in kW) multiplied by number of hours in the relevant period;

e. "**Annual Degraded Plant Net Heat Rate**" or "**ADPNHR**" means the Annual degraded Plant Net Heat Rate, including the yearly applicable Degradation Factor

f. "**Annual Plant Net Heat Rate**" or "**APNHR**" means the Annual Plant Net Heat Rate shall be the annual average of Unit 1 to Unit 3 based on Coal delivery weight measurements as shown at the loading point and coal quality measurement carried out using systematic sample methods at the loading point and kWh measurement at the Plant's outgoing terminals. The APNHR shall be expressed in kCal/kWh as the yearly sum of the Monthly Weighted Average Calorific Values of Coal (x) multiplied by the total weight of Coal consumed during that period, and (y) that sum divided by the Energy (kWh) delivered at the Plant's outgoing terminals.

g. "**Annual Report**" means the annual report upon performance prepared by the Operator as described further in ANNEXURE I.

h. "**Authorization to Proceed**" means written authorization from the Owner to the Operator authorizing the Operator to proceed with performance of the Services as specified by such authorization.

i. "**Auxiliary Consumption**" means the Energy consumed in the auxiliaries of the Generating Station.

j. "**Availability Factor**" means the ratio of the Cumulative Average Availability and the Normative Plant Load Factor

k. "**Coal**" means coal satisfying the specifications set forth in Annexure B.

l. "**Commercial Operation Date**" - With respect to each Unit, the date upon which it has successfully completed its Acceptance Tests and is available to commence operation on a continuous, full-time, commercial basis as declared by the Owner.

m. "**Competent Authority**" means any local or national or supra-national agency, authority, department, inspectorate, ministry, official, court, tribunal, or public or statutory person (whether autonomous or not) of the Republic of India (including but not limited to any Government Agency) which has jurisdiction over the parties to, or the subject matter of, this Agreement or any of the other Plant Agreements, and this definition includes, for the avoidance of doubt, any authority that may affect the Owner's or the

Operator's ability to cost or perform any of its or their obligations under the Plant Agreements or any authority that gives consents or permits (including Permits).

n. "**Contract Year**" means each twelve Month period commencing on April 1st of a year and ending on March 31st of the following year.

o. "**Contractor**" means all contractors of the Owner in relation to the Plant (including without limitation the EPC Contractor), and their respective subcontractors, all in their respective capacities as such and the successors and permitted assigns of any of the foregoing.

p. "**Declared Capacity**" In relation to a Unit or the Power Station at any time means the net capacity of the Unit or the Power Station at the relevant time (expressed in MW at the Interconnection Point) as declared by the O&M Contractor in accordance with the Grid Code and dispatching procedures as per the Availability Based Tariff;

q. "**Degradation Factor**" or "**DF**" means expressed in kCal/kWh or in percentage, a correction value for each of Unit 1 to Unit3, determined annually.

r. "**Demobilization Period**" means the period of time beginning on the first day following:

   i. the end of the Plant Operating Period or
   ii. the earlier delivery of a Termination Notice and continuing for a period of ninety (90) days thereafter or
   iii. mutually agreed period.

s. "**Directive**" means any present or future law, regulation, decree, directive, requirement, instruction, or rule of any Competent Authority, or the conditions of or attaching to any duly issued Permit, binding on the Owner or the Operator and includes any modification, extension or replacement thereof then in force, and further includes any Guidelines.

t. "**Effective Date**" means the date of signing of this Agreement.

u. "**Emergency Event**" means a sudden and unexpected event or circumstance which has caused or reasonably threatens to cause (a) serious bodily injury to any personnel employed at the Site or any other persons at or in the vicinity of the Site; (b) serious physical damage to the Plant, including the Site or other material or property located at or in the vicinity of the Site; (c) a work stoppage or other serious labour disturbance at the Site; (d) a shutdown or other serious interruption in or interference with the operation or functioning of the electrical distribution facilities relevant to or otherwise affecting the Plant; (e) imposition of fines or other penalties or sanctions under any Directive, (except those penalties levied by Owner as per the agreements of this Contract with O&M Contractor) which fines, penalties or sanctions would be likely to affect seriously the ability of Owner or the Operator to perform any of its or their obligations; or (f) an occurrence of any accident materially impacting on the environment.

v. "**Environmental Law**" means any Directive relating to the environment, health or safety or affecting the environment or Hazardous Materials, which governs, affects, or relates to the Owner, the Operator, the Plant (including the Site), as now or hereinafter in effect.

w. "**EPC Contractor**" means any and all of the parties to the EPC Contracts, other than the Owner.

x. "**EPC Contracts**" means any agreements entered into between the Owner and the Contractors (including but not limited to the EPC Contractor) for the coordination and/or completion of the engineering, design, construction, start-up, commissioning and testing up to handing over of the Plant, as amended, supplemented or modified from time to time in accordance with the terms thereof and including all subcontracts (of whatever tier) thereto.

y. "**Forced Outage**" means an interruption or reduction in the generating capacity of the Plant that is

i. not a Scheduled Outage of a Unit, a Switchyard or a Grid System;
ii. not a request of PSPCL to the Owner to curtail generation;
iii. not a Force Majeure Event;
iv. created either directly or indirectly due to negligence/ignorance /mal operation of the O&M contractor.

z. "**Gross Calorific Value of Primary Fuel**" means the gross calorific value of coal delivered by each rake expressed in Kcal/Kg. This shall be based on accepted sampling method.

aa. "**Gross Calorific Value of Secondary Fuel**" means the gross calorific value of light diesel oil delivered by each tanker to the Facility expressed in Kcal/ml.

bb. "**Gross Generation**" means the total energy delivered at the generator terminals for the Facility or for a Unit.

cc. "**General/Standard Terms and conditions"** means terms and conditions as per Annexure L

dd. "**Guidelines**" means the environmental guidelines or procedures required to be followed by the Owner at any time during the Term.

ee. "**Hazardous Materials**" means any chemical, material, contaminant, substance or waste declared to be hazardous, dangerous, and toxic or a polluting material by any Competent Authority and/or pursuant to any Directive, or exposure to which is prohibited or regulated by any Competent Authority.

ff. "**Initial Staffing Plan**" means the initial estimate of the Operator Staff and Plant Staff required to perform the Services,

gg. "**INR**" means Indian Rupees, the legal currency of the Republic of India.

hh. "**Lien**" means any lien, claim, security interest, mortgage, trust arrangement, judgment, charge, easement, encumbrance, title retention, preferential right or any other security agreement, arrangement or similar right in favour of any Person.

ii. "**Liquidated Damages**" means any liquidated and ascertained damages calculated under and payable by the Operator to the Owner.

jj. "**Losses**" means any and all liabilities, losses, damages, claims, costs, obligations, charges and expenses (including without limitation reasonable attorneys‟ fees) of whatsoever kind or nature.

kk. "**Major Sub-Contract**" means any Sub-Contract [under which the total consideration payable is or may reasonably be expected to be in excess of Rupees ten lakhs] (or the equivalent) or which concerns the provision of any of the Services which is entered into with an Affiliate of the Operator.

ll. "**Manufacturers' Manuals**" means manufacturers‟ instruction manuals and operating and maintenance procedures to be delivered or delivered by the EPC Contractor under the EPC Contracts.

mm. "**Material**" shall mean all materials, documents and computer software, whether in electronic format or otherwise used, created, prepared or developed by the Operator or its employees, representatives or Sub-Contractors pursuant to or otherwise in connection with this Agreement, including but not limited to all manuals, data, designs, drawings, plans, specifications, reports and accounts.

nn. "**Mobilization Period**" means period till the takeover of the plant from effective date.

oo. "**Month**" means a period that starts at 00:00 local standard time the first day of any calendar month and ends at 24:00 local standard time of such calendar month.

pp. "**Monthly Report**" means the report upon operation and maintenance prepared by the Operator each Month.

qq. "**O&M Manuals**" means operating and maintenance manuals for the Plant, which shall include any management and administrative policies and operating and maintenance procedures required in the Agreement to be developed, together with the documents and schedules described in such manuals, which shall be developed and mutually agreed upon by the Owner and the Operator. (As such manuals may be amended, modified or replaced from time to time by the Operator with the prior written approval of the Owner, which approval shall not be unreasonably withheld save where the amendment, modification or replacement is a valid requirement.).

rr. "**Office Staff**" means the office manager and all subordinates of the office manager.

ss. "**Operating Costs**" means those costs and expenses of operating, maintaining and repairing the Plant incurred or paid by the Operator on behalf of the Owner in connection with Operator's performance of the Services, but excluding any Liquidated Damages, indemnities, penalties or other amounts payable by the Operator hereunder or for which the Operator is responsible.

tt. "**Operator Staff**" means those employees of the Operator, which are dedicated solely for the purposes of providing the Services, reside in India and work at the Site. Only those employees who are included within the then current Staffing Plan are considered to be Operator Staff.

uu. "**Owner's Engineer**" means any independent engineer designated by the Owner from time to time to advise and assist the Owner, among other things, in connection with the subject matter of this Agreement; provided, that such independent engineer shall not be an Affiliate of the Owner or the Operator.

vv. "**Performance Guarantee**" means the irrevocable, unconditional Bank Guarantee of the Guarantor in the form prescribed.

ww. "**PG Test or Performance Guarantee Test**" means the performance guarantee tests, carried out by such party as designated by the Owner, for each Unit/Facility to measure and verify O&M Contractor's Guaranteed Performance Parameters.

xx. "**PG Test Value**" means the value of each Guaranteed Performance Parameters demonstrated on conduct of the Performance Guarantee Test for the Plant as each Unit is commissioned and as notified by the Owner to the O&M Contractor. Notwithstanding anything else in this O&M Service Agreement, in case PG Tests are not performed prior to Handover of Units to the O & M Contractor, the values demonstrated by the EPC Contractor and accepted by the O & M Contractor and the Owner during the Performance Guarantee Test, with appropriate corrections as mutually agreed upon by

the Owner and the O&M Contractor.

yy. "**Permit**" means any authorization, approval, decision, license, ruling, permit, certification, exemption, variance, filing or registration by or with any Competent Authority required for the operation, maintenance, ownership or possession of the Plant.

zz. "**Person**" means, unless specified, a natural person, corporation, society, partnership, joint venture, unincorporated association or other entity, including a Competent Authority.

aaa. "**Plant Load Factor**" or "**PLF**" in relation to any given period means the ratio, expressed as a percentage, of (a) the gross generation; over (b) the Rated Capacity (in KW) multiplied by the number of hours in the relevant period.

bbb. "**Plant Manager**" means the individual appointed by the O&M Contractor who subject to the necessary approvals shall be authorized and empowered to act as the agent for and on behalf of the Operator on all matters concerning the O&M Agreement and the Operator's obligations there under.

ccc. "**Plant Staff**" means those persons being employees of the Owner who are engaged in the operation, maintenance or repair of the Plant for the purposes of supporting the Operator in meeting its obligations under this Agreement.

ddd. "**Plant**" means (a) the electric power generating facility that is being constructed in TSPL, Mansa, Punjab India consisting of, among other things, three Units, each to be constructed with a Rated Capacity (as defined in the EPC Contract) of 660 MW and in accordance with (i) the plant specifications described in Schedule and (b) without reducing or derogating from clause (a) or (c), all associated equipment, land, the Site, buildings, engineering and design documents, other energy producing equipment and all auxiliary equipment, Railway, Coal handling, fuel handling and storage infrastructures, water supply and treatment facilities, ash disposal facilities and all other equipment installed or to be installed within the Plant boundary & Associated facilities like water intake system & Railway terminal points as mentioned in battery limits pursuant to obligations contained in the Plant Agreements, and (c) without reducing or derogating from (a) or (b), means, with respect to the delivery of Services by the Operator and the scope of the responsibilities and obligations of the Operator hereunder, the items described in (a) and (b), including without limitation the Units, the Switchyard (as defined in and to the extent a responsibility of the Owner), are not constructed under and pursuant to the EPC Contracts.

eee. "**Plant Agreements**" means the O&M Agreement, the Coal Supply Agreements, the EPC Contracts, the Land Lease Agreement, Secondary Fuel Supply and Transportation Agreements, and the other contracts or subcontracts of the Owner relating to the construction, operation, overhaul, maintenance and repair of the Plant or the Services, contracts for the removal, transportation and disposal of waste or ash from the Site, as such agreements exist on the date hereof and, except for this Agreement, have been delivered by the Owner to the Operator and as such agreements may be amended or modified after the date hereof, where such amendments or modifications have been made available to the Operator in writing.

fff. "**Plant Operating Period**" means the period of time commencing on the takeover of the Plant by the O&M Contractor and continuing until the end of the fifth (5th) Contract

Year thereafter or until the Contract is terminated / extended as per the provisions of the Contract.

ggg. "**Prudent Utility Practices**" means the exercise of that degree of skill, diligence, prudence, foresight, and operating/maintenance practice generally followed internationally by highly qualified, prudent professionals in any of the following businesses as the context may require:

a. the loading, unloading, handling and storage of Coal or Secondary Fuel and

b. the private electric power generation industry with respect to the design, engineering, construction, testing, metering, repair, operation and maintenance of electric generating, transmission and distribution facilities, including in the procurement of spare parts, spare equipment and spare components in relation thereto; which in any such case should have been expected to accomplish the desired result at the lowest reasonable cost, consistent with licensing and regulatory considerations, environmental considerations, reliability, safety and expedition. Prudent Utility Practices is not intended to be limited to the optimum practice, method or act, to the exclusion of all others, but rather to be a spectrum of possible practices, methods or acts employed by owners and operators of facilities similar in size and operational characteristics to the Plant.

hhh. "**Rated Capacity**" means the generating capacity of the Plant which shall be 1980 MW or 660 MW for one Unit and subject to adjustment in accordance with the EPC Performance Test results.

iii. "**Representative**" means, for each Party, a Person designated by notice in writing to the other Party.

jjj. "**Scheduled Maintenance**" means such scheduled and pre-agreed maintenance as may be authorised in the relevant Annual Operating Plan.

kkk. "**Scheduled Outage**" means an interruption or reduction in the generating capacity of the Plant which is planned and forms a part of an Annual Operating Plan and which is (a) not a Forced Outage or an outage for Scheduled Maintenance of the Plant ("Maintenance Outage"); (b) has been scheduled and allowed in accordance with the Dispatch Instructions. Notwithstanding the fixing of a time for a Scheduled Outage in the Annual Operating Plan, the Owner may, with at least 30 days prior written notice, request the O&M Operator to re-schedule a Scheduled Outage. Provided however, that Owner shall not require such Scheduled Outage to be re-scheduled for a period which, in the reasonable judgment of the O&M Operator, risks damage to the Plant or is not feasible for operational reasons and (c) is for inspection, testing, preventive maintenance, corrective maintenance, repairs, replacement or improvement, as the case may be, together with any other maintenance measures that the O&M Operator elects to carry out during the relevant Contract Year on the basis of Prudent Utility Practices

lll. "**Secondary Fuel**" means fuel oil to be used at the Plant meeting the specifications in Annexure B.

mmm. "**Services**" means any or all of the obligations to be performed, responsibilities to be carried out and goods to be provided by the Operator pursuant to this Agreement, including any Additional Services.

nnn. "**Spare Parts**" means those spare parts, spare equipment and spare components maintained or to be maintained by the Operator in accordance with the terms of this Agreement in connection with the operation, maintenance and repair of the Plant.

ooo. "**Staffing Plan**" means the approved Staffing Plan of the O&M Contractor.

ppp. "**Store**" means a storage of all kind of (included but not limited to) engineering spares, consumables, tools & tackles, administrative infrastructural goods etc.

qqq. "**Stores Management**" means complete management of receipts, issue and accounting of stores & ensuring safe custody and preservation as per standard norms.

rrr. "**Sub-Contract**" means any contract (except this Agreement) entered into by the Operator, or a Sub-Contractor, and a third party for the carrying out of any of the responsibilities or obligations of the Operator under this Agreement.

sss. "**Sub-Contractor**" means any person carrying out any of the responsibilities or obligations of the Operator under this Agreement under or pursuant to a Sub-Contract, the sub-contractor being duly approved by the Owner.

ttt. "**Termination Notice**" means the notice delivered by either party, following an Owner's Event of Default or an Operator's Event of Default as the case may be, which notice shall specify the range of rights and obligations to be terminated and the Termination Date.

uuu. "**Unit**" means Unit 1 or Unit 2or Unit 3, as the case may be.

## 2.0 TERM OF THE O & M AGREEMENT

The O & M Agreement shall commence on the "**Effective date**" and continue in effect until the end of the Operating Period unless it is terminated earlier in accordance with the provisions of the O&M Agreement. The Term may be extended on terms mutually agreed by the Parties and consistent with the other Plant Agreements

### 2.1 CONDITIONS PRECEDENT

1. All the needed Clearances shall have been received by the Owner and by the O&M Contractor as described in Annexure H.
2. The O&M Operator shall have executed and delivered the Parent Company Guarantee to the "Owner".
3. Notification by the Owner and Receipt by the O&M Contractor of the "Authorization to Proceed".

### 2.2 COMMENCEMENT OF WORK

The O&M Operator shall perform the services for a period starting upon the Effective Date. Services shall be separated into the following phases:

1. the Mobilization Period – mutually agreed
2. the Operating/Maintenance Period Services- from takeover of the plant by successful bidder to the end of Term.
3. the De-mobilization Period. - at the Termination of the O&M Agreement.

### 2.3 END OF TERM

The O&M Agreement shall expire on the 5$^{th}$ anniversary unless this Agreement is terminated earlier pursuant to the terms provided in the O&M Agreement. Prior to the expiration of the O&M Agreement, the Owner and the O&M Contractor may agree to extend the Term, by mutual agreement, provided the Owner elects not to assume responsibility for the operation and maintenance of the Facility.

# 3.0 PLANT AND FACILITY DESCRIPTION, LIMITS AND SPECIFICATIONS

## 3.1 FACILITY DESCRIPTIONS, SPECIFICATION AND PERFORMANCE

Site Description and Boundaries of installations under O&M Operator Responsibility is Shown enclosed as Annexure A. The Annexure includes the Plant information and the Scope of Equipment in the TSPL

## 3.2 FUEL SPECIFICATIONS

The Fuel specifications are provided in Annexure B: Fuel Specification.

## 3.3 RAW WATER SPECIFICATIONS

The Analysis of raw water is provided in Annexure C.

## 3.4 ANTICIPATED FUEL SUPPLY REGIME

Coal Supply

TSPL has a FSA with MCL/CIL subsidiary for supply of Coal to TSPL. Additional Coal will be arranged by Owner however O&M Operator shall support for coordination requirement for Coal Supply.

LDO / HFO Supply

"Owner" will also undertake to supply LDO /HFO for the Plant requirements on the basis of the Annual Fuel Plan.

## 3.5 PLANT ENVIRONMENTAL DATA, SPECIFICATIONS AND GUIDELINES

The relevant environmental data are provided in Annexure D: Plant Environmental data, specification and guidelines.

## 3.6 CONTRACT GUARANTEE TESTS

The Contract Guarantee Tests, for boilers and turbines are provided in Annexure E: Contract Guarantees.

## 3.7 PERFORMANCE TESTS DURING THE CONTRACT TERM

The Owner may from time to time during the Term of the O&M Contract, but not more frequently than 12 (twelve) months, request the O&M Operator to demonstrate the Unit's tested capacity by carrying out Performance Guarantee tests. Such Capacity Demonstration tests shall be carried out at no extra cost to the Owner.

Contractor shall perform Repeat Performance & Capacity Demonstration test as & when directed by Owner/PSPCL.

## 3.8 TECHNICAL LIMITS - AT THE CONNECTING POINT

The nominal steady state electrical characteristics of the system are as follows: - Three phase alternating current at 50 Hz frequency, -5% to +3%; Nominal Voltage of 400 KV (+-) 10%;

Power factor (at maximum rated power) 0.9 and above (lagging) PSPCL System Parameters and Grid requirements. However all technical limits as per IEGC/Punjab

Electricity Grid code/LDC directive shall be followed.

### 3.9 REQUIREMENTS UNDER O&M CONTRACTOR RESPONSIBILITY, DISPATCH PROCEDURES.

The O&M Operator shall ensure that the TSPL operates at a DC of >95%. & dispatch Schedule & revision as provided by SLDC following the provision of Grid Code/relevant procedures.

### 3.10 ANTICIPATED OPERATING REGIME OF THE PLANT

The Power Plant is to be operated at a Cumulative Average Station Availability Factor of 95% per annum. The Station Heat rate is expected to not exceed 2223 Kcal/Kwh.

The anticipated operating regime of the plant includes the number of running hours per year, the number of starts, loading regime.

## 4. TITLE DOCUMENTS AND DATA

### 4.1 RESPONSIBILITIES FOR PROVIDING MATERIALS AND EQUIPMENT

The Owner shall procure the Initial supply of equipment and Spares resulting from the contracts and from an agreement between the Owner and the O&M Contractor shall procure the additional supply and restock. The O&M Operator shall review the list and advise the Owner on the adequacy/inadequacy of the Spares.

The O&M Operator shall be responsible for storage; preservation and safekeeping and maintenance of materials, equipment and parts and replacement of any used spares. On the Termination of the O&M Agreement, the O&M Operator shall hand over the spares as per list of Spares given to him at the commencement of the Term.

### 4.2 DOCUMENTS

All materials and documents furnished to the O&M Operator by Owner shall be delivered to the Owner upon expiration of the Term.

The operating documents and historical data like Logs, Records, Reports, standard operating procedures, emergency operating procedures and any other data generated during O&M by O&M Operator, must be handed over to owner on expiration of term. For the documents that are subject to copyright, patent and other intellectual property protection, the Owner is hereby granted an irrevocable license by the O&M Operator to use the same for any purpose in connection with the operation maintenance repair and use of the Facility.

## 5.0 OWNER'S GENERAL OBLIGATIONS, RESPONSIBILITIES AND PROVISION

### 5.1 GENERAL

Owner shall furnish to the O&M Operator, at Owner's expense, the information, services, materials and other items described in this Section. All such items shall be made available at such times and in such manner as may be reasonably required for the expeditious and effective performance of Services by the O&M Contractor.

### 5.2 THE FACILITY

Owner shall be responsible for entering into Contracts and engaging the Contractors for which the O&M Operator is not responsible.

Owner shall at its cost and expense pay for any upgrades additions improvements or changes to the Facility which Owner determines to be necessary or advisable, including any upgrades, additions, improvements and changes that may be necessary in Owner's judgment to comply with applicable Directives and any relevant Change in Law.

### 5.3 OWNER'S CLEARANCE

Owner shall obtain or acquire at its cost and expense the initial Clearances required in connection with the development, construction financing, ownership, operation and maintenance of the Plant Facilities, as set forth in Annexure H and any renewals, replacements and any other Clearances required thereafter, from time to time. Owner will reimburse statutory fees and issue the appropriate letters for all renewals

During the Mobilization Period, the Owner shall at regular intervals give notice to the O&M Operator of its progress in the application and obtaining of the Owner's Clearances.

Owner shall reasonably assist and co-operate with the O&M Operator in securing, complying with, renewing or replacing any Clearances for which the O&M Operator is responsible under O&M Operator's Clearances and to provide any information reasonably requested by the O&M Operator in connection with Clearances required by the O&M Operator to perform the Services.

### 5.4 OFFICE FACILITIES

The Owner shall provide the O&M Operator with facilities for offices as available, storage according to the needs as defined in the O&M Operator's Mobilization Plan set forth in O&M Operator Mobilization Plan. However residential accommodation and medical facilities, will have to be arranged by O&M Operator.

### 5.5 SECURITY AND INDUSTRIAL SAFETY

The security and Industrial safety of the plant and facility is the responsibility of the O&M operator after the Mobilization.

The Owner shall be responsible for security and Industrial safety of the site during the Mobilization period.

## 5.6 ACCESS TO FACILITIES

Owner shall at all times during Contract duration provide to the O&M Operator unrestricted access and egress to and from the site and the Facility from a public road. Also the Owner will have access to all operations of the plant through remote / central monitoring and diagnostic systems as well as physical inspections

## 5.7 FACILITY AGREEMENTS AND INFORMATION

### 5.7.1 General

Owner will administer the Facility Agreements, provided that the O&M Operator shall, to the extent set forth in the O&M Manuals and in the O&M Agreement or as may be agreed by Owner and the O&M Operator have day-to-day operational responsibility to perform all facility operations in accordance with the terms of such agreements.

From and after the Effective Date, Owner shall provide the O&M Operator with copies of all the Facility Agreements and any technical operational and other information in Owner's possession or under its control, which could have an effect on the performance of Services by the O&M Operator under this Agreement. The Owner shall deliver to the O&M Operator, during the mobilization period, copies of all the draft Plant details in their current form.

Owner shall provide the O&M Operator with reasonable prior notice of any changes to the Facility Agreements. In the case of any addition, amendment or replacement of any of the Facility Agreements, or any agreement replacing any Facility Agreement. Owner shall provide the O&M Operator with copies of the relevant Agreements.

Without limiting any other provision of the O&M Agreement, Owner shall keep the O&M Operator informed regarding events that will affect the schedule for performance of the Services.

### 5.7.2 Contractor Supplied Items

In accordance with the Mobilization Plan as described in, O&M Operator Mobilization Plan", Owner shall make available to the O&M Contractor information on facilities and services to be provided by Contractors under Contract, as are necessary for performance of the Services, as described in O&M Contractor's general obligations, O&M Contractor's obligation during the Mobilization period, O&M Operator obligations during the Operating period.

Owner shall deliver to the O&M Operator, as soon as reasonably possible following the Effective Date, copy of all Facility Manuals, design drawing that Contractors provide to Owner under the Contracts and Owner shall cause Contractors to provide such training services and materials as Contractors are obligated to provide pursuant to the Contracts.

At all times during the Mobilization Period, Facility Manuals shall be under the

care and custody of Contractors provided that the O&M Operator shall have access to such of the Facility Manuals as are reasonably required to perform its obligations under this Agreements.

At all times Facility Manuals shall be under the care and custody of the O&M Operator, provided that Contractors shall have access to such of the Facility Manuals as are necessary to perform its obligations under the Contracts. Owner shall have access at all times to Facility Manuals in the possession of the O&M Operator.

The O & M contractor shall provide necessary assistance to prepare the as built drawings.

#### 5.7.3 SUPPLY OF FUEL

The Owner shall be responsible to enter into Contracts for furnishing and delivering Coal & Fuel, at all times after Effective Date during the Term, at Owner's cost and expense. The owner shall be responsible for providing the quality and quantity till Sadda Singh Wala Railway Station. The Owner shall also be responsible to engage a Contractor for supplying the secondary fuel.

The O&M Operator shall manage the entire value chain (Quality, quantity, logistics & handling) right from Sadda Singh Wala Railway Station till site unloading & storage. The GCV as determined by the third party appointed by TSPL is the binding value for all heat rate calculations. Similarly the quantity as per the TSPL railway in motion weighbridge.

#### 5.7.4 SUPPLY OF WATER

The requirements of raw water shall be met from the Jagga Canal. O&M Operator is responsible to supply water from the source to the internal water reservoir within the plant boundary and O&M of portion of canal network of TSPL. All the coordination with the irrigation department of Punjab for the water supply from the state canal network will be in scope of O&M contractor.

#### 5.7.5 SUPPLY OF BACK-UP POWER, START-UP POWER

The Owner shall provide at the site with Back-up Power and Start-up Power for operation and maintenance of the Facility, at all times after Effective Date during the Term, at the Owner's cost and expenses however coordination with LDC shall be the responsibility of O&M Operator

### 5.8 SPARE PARTS PROVIDED BY OWNER

The Owner shall provide, at its own cost and expense and in accordance with the O&M Operator's Mobilization Plan in timely manner, to the O&M Operator with the items to be supplied under Contract with plant/equipment supplier.

### 5.9 OWNER'S COSTS

The Owner shall be responsible for, and shall pay directly or cause to be paid or

reimburse the O&M Operator, the following costs and expenses relating to operation and maintenance of the Facility:

1. Property, sales and use taxes relating to the ownership by the Owner of the Plant sites and Facilities.
2. Legal and accounting costs of the ownership of the Plant sites and Facilities.
3. Reimbursement of Statutory fees (on production of proof) paid for obtaining Clearances under the O&M Agreement and other taxes and duties levied by PSPCL and Competent Authorities in connection with the Plant:
4. Costs of fuel, water, back-up power and start-up power.
5. Any other changes in statutory fee as per the government regulations shall be pass through to O&M operator.

## 6.0 OBLIGATIONS OF THE O&M OPERATOR

### 6.1 GENERAL SERVICES TO BE PROVIDED BY THE O&M OPERATOR

6.1.1 The Owner hereby appoints the O&M Operator to operate and maintain the Plant in accordance with the provisions of this O&M Agreement. The O&M Operator is appointed as an independent contractor. The Services shall include:

a. operation and maintenance of the Plant for the Term on a non-stop basis for 24 hours per day and seven days per week;
b. generation of electricity from the Plant;
c. storage and un-loading of coal and secondary fuel;
d. performance of all duties and responsibilities (other than payment responsibilities where applicable) of the Owner in relation to the Plant; and
e. the general operation, maintenance, repair and administration of the Plant in accordance with this O&M Agreement, and the obligations of the Owner under the other Agreements, all as more specifically described in this O&M Agreement. Without limiting the generality of the foregoing, Services to be performed by the O&M Operator hereunder shall include without limitation acts, activities and other matters set out for effective operation of the Plant in Annexure K.

6.1.2 Subject to, and in accordance with, any Directives, the provisions of the O&M Agreement and Prudent Utility Practices, O&M Operator shall operate the Plant in accordance with the Dispatch Instructions.

6.1.3 O&M Operator will provide all the Services utilizing the expertise, know-how and experience of its group companies overseas, in particular, the services for the:

a. development of a training program for maintenance personnel six months prior to de-mobilization period, preparation and review of five years rolling maintenance plan, technical support and root cause analysis of unscheduled outage;
b. development of a training program for operations, personnel, review, analysis and interpretation of plant operating parameters six months prior to de-mobilization period;
c. preparation and review of Annual Operating Plan and Annual Budget;
d. review and updating of the O&M Manual; and
e. maintenance and up-gradation of all computer software provided by the O&M Operator.

6.1.4 It shall be the responsibility of the O&M Operator to obtain such Permits as may be required for it to perform the Services for the Plant. In case Permits are to be obtained by the Owner, the O&M Operator is responsible for notifying the Owner reasonably in advance so as to ensure undisrupted smooth operations of the Plant.

6.1.5 If any services are required for the operation and maintenance of the Plant that are not within the scope of the Services, the O&M Operator shall carry out such services as Additional Services at a price to be agreed by the Parties, provided that:

a. in the reasonable judgment of the O&M Operator, the O&M Operator is able and qualified to perform such Additional Services; and
b. doing so would not impair the ability of the O&M Operator to perform any or all of its other responsibilities under this O&M Agreement.

6.1.6 The O&M Operator shall engage suitable resources for coal-management at plant.

6.1.7 The O&M Operator shall develop and compile in writing operating procedures for the Plant, a draft copy of which shall be handed over to the Owner forty-five (45) days prior to the takeover of the Plant. Such operating procedures shall be based on the designs of the Plant and the O&M procedures provided by the EPC Contractor as well as O&M Operator's prior experience in operating plants of similar size. Further, the said procedures of the O&M Operator shall be consistent with the capabilities of plants of the nature of the Plant and Prudent Utility Practices and cover all operational interfaces between the Owner, the O&M Operator and the SEB, including, but not limited to, the methods of day-to-day communication, key personnel, clearances and switching practices, scheduling of outages, capacity and energy reporting, operations log and reactive power support.

6.1.8 The O&M Operator is responsible for devising and implementing an appropriate strategy for coal yard management (including the blending of coal using a mix of imported and domestic coal) so that the design parameters of boilers and other equipment of the Plant are maintained. O&M operator shall develop systems and process for optimum utilization of coal and make continuous efforts to reduce the specific coal consumption.

6.1.9 The O&M Operator shall classify the equipment in the Plant into the following categories: (a) Critical; (b) Important, i.e., critical but having reserve back-up; and (c) Non-Critical for each season. It shall be the responsibility of the O&M Operator to ensure that the equipment classified as "Critical" and "Important" has a high availability factor so that the Plant-availability is maintained at a high level. In particular, during the rainy season, the O&M Operator shall ensure practices so that Plant Availability Factor remains high.

6.1.10 Throughout the Term, the O&M Operator shall maintain and report the life cycle asset management of the components of the Plant.

6.1.11 The O&M Operator shall ensure that, throughout the Term, the Plant functions in compliance with all environmental and other laws and shall be responsible to obtain and maintain in the name of the Owner all Permits as required in relation to the Plant.

6.1.12 The Owner and O&M Operator shall mutually establish yearly score cards for the achievement of goals such as housekeeping standards, safety rules, people management standards and environmental protection standards. The O&M Operator shall establish procedures for a fire and safety drill as approved by Owner.

6.1.13 A performance indicator scheme for safety/housekeeping needs shall be implemented by the O&M Operator for each Contract Year based on the O&M Operator proposing schemes based on its prior experience and mutual agreement between the Owner and the O&M Operator within 30days from the Effective Date.

6.1.14 The O&M Operator will also perform energy audits for the improvement in the performance of the Plant. O&M Operator shall also carry out works for analysis, documentation and performance improvement for PAT (Performance Achievement Rate) related obligation for O&M.

## 6.2 STANDARDS OF PERFORMANCE OF SERVICES

6.2.1 The Services shall be performed in accordance with the express and implied standards and requirements of this O&M Agreement, including, without limitation, in accordance with the following:

a. so as to meet the Guaranteed Performance Parameters;
b. the Annual Operating Plan and the Annual Budget and the policies, procedures and other plans and budgets to be established pursuant to this O&M Agreement;
c. the O&M Manuals;
d. the recommendations and requirements of any warranties or guarantees existing in relation to Plant, equipment, materials or other work provided or procured by the EPC Contractor and to perform the Services in such manner as does not invalidate or reduce the scope or coverage of any such warranties or guarantees;
e. the provisions of the Agreements;
f. all applicable laws, relevant codes & practices covered under Electricity act & Grid codes (including Punjab Grid code and operating procedures but not limited to) and all Permits. In this regard it shall be the responsibility of the O&M Operator to, on behalf of and in the name of the Owner, obtain all Permits (other than such Permits that are to be obtained by the Owner under Annexure H), maintain all Permits, pay the applicable statutory fee, maintain all such records and file all such returns and information with the relevant governmental authorities as may be required under any Law for the time being in force;
g. all Directives;
h. applicable Dispatch Instructions, instructions and operational rules and performance standards and procedures, further all operating requirements covered under PPA refer Annexure J the requirements (including staffing) of any under the Agreements;
i. so as not to cause any outage, except for Scheduled Outages and so as to optimize Scheduled Outages taking into account the life cycle management of the Plant.
j. so as to produce the most efficient heat rate and efficiency for the Plant and to optimize the overall operating and maintenance costs (including fuel and inventory costs) of the Plant taking into account the life cycle management of the Plant.
k. in a manner consistent with insurance policies maintained either on behalf of the O&M Operator or the Owner in relation to any or all of the Plant and so as not to vitiate or annul any cover afforded by such a policy of insurance; and
l. in accordance with Prudent Utility Practices and environmental regulations.
m. all Vedanta policies, Code of Conduct, Modern Slavery Act, etc.

6.2.2 In the event that any of the standards and requirements under Section 6.2.1 above or elsewhere in this O&M Agreement 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 under the then applicable laws, regulations or Prudent Utility Practices, the more stringent, restrictive or onerous of the standards or requirements shall apply to the O&M Operator's performance of the Services hereunder.

6.2.3 In the event that the O&M Operator determines in its reasonable judgment that a conflict or inconsistency exists in the performance standards and requirements

described in this Section 6.2 or elsewhere in this Agreement, the O&M Operator shall notify the Owner in writing as soon as practicable of such conflict or inconsistency and provide the Owner with a recommendation for a course of action in writing. The O&M Operator shall act in accordance with such recommendation, within 15 days of notification to the Owner, unless or until instructed to the contrary by the Owner.

## 6.3 INITIATION SERVICES (DURING THE MOBILIZATION PERIOD)

6.3.1 No later than ninety (90) days after the Effective Date and within the Mobilization Period, the O&M Operator shall deliver to the Owner each of the following materials and information in such form as is acceptable to the Owner:

a. written job descriptions in reasonable detail for each category of the Plant O&M Staff and any revisions to the Proposed Staffing Plan and Staff Ramping Up Plan;
b. written confirmation of policies of insurance to be maintained by the O&M Operator for the Plant as required under this O&M Agreement having been obtained by the O&M Operator;
c. copies of duly issued Permits, if any, required to be obtained by the O&M Operator for the performance of the Services;
d. documented review of the Initial Spare Parts lists for the Plant and Spare Parts inventory recommendations and confirmation in writing that the Spare Parts lists and inventory recommendations for the Plant exist and are sufficient to support the level and nature of operation and maintenance required under this O&M Agreement;
e. documented review of the commissioning procedures for all the equipment of the Plant and, together with the Owner, development/improvement of the commissioning procedures for the various items of equipment. It is the Owner's responsibility to develop the commissioning procedures, however, if requested by the Owner, the O&M Operator shall perform the same, at such fee as is agreed by the Parties;
f. furnish the Security Deposit Bank Guarantee; and
g. furnish a tentative list of the persons proposed for the positions required for the Plant.

## 6.4 SERVICES DURING THE MOBILIZATION PERIOD

6.4.1 Upon commencement of the Mobilisation Period the O&M Operator shall carry out the following Services to be completed on or before Plant takeover, unless Services are of an on-going nature, in which case the O&M Operator shall continue to perform them for the Term, unless otherwise specified:

6.4.2 inspection of the Plant or each Unit thereof, and reporting to the Owner any non-conforming equipment or incomplete work or other matter that could hinder or adversely affect the safe operation of the Plant or Unit or its Guaranteed Performance Parameters (such matters are collectively referred to herein as the "Pending Items"). Although there is no obligation on the part of the Owner to identify any Pending Items, the Owner will inform the O&M Operator on Pending Items, if any, of which it is aware.

6.4.3 review and provision of written comments on Plant designs and plans prepared by or on behalf of the EPC Contractor;

6.4.4 recruitment and/or deputation of Plant O&M Staff and commence their training.

6.4.5 Provide comprehensive information and training to the relevant Owners' staff at the Plant in regard to (a) all software systems provided by the O&M Operator and used for the operation and maintenance of the Plant; and (b) procedures for the operation and maintenance of the Plant;

6.4.6 making available necessary personnel

6.4.7 carrying out risk hazard analyses (HAZOP) and, in connection with the development of and as part of the procedures contained in the O&M Manuals, develop in the form of written drafts: (i) initial safety and security procedures (ii) site-specific operation and maintenance procedures (including emergency procedures for response to Emergency Events) and (iii) environmental procedures and an environmental support plan as part of the development of the O&M Manuals;

6.4.8 Development of the plant maintenance system, to be configured for use with the Owner's existing SAP software; and also diagnostic centre

6.4.9 All the required software systems to be installed and configured by the O&M Operator will provide for, at a minimum: (i) preventive maintenance; (ii) predictive maintenance; (iii) routine maintenance; (iv) breakdown maintenance; (v) key equipment performance trending; (vi) outage backlog; (vii) inventory control by linkage to SAP; (viii) historical documentation; and (ix) life time monitoring. In addition, the software systems will have the ability to collect and collate dynamic operating data and provide critical performance indicators and parameters including, but not limited to: (ia) boiler efficiency (ib) heat rate (ic) auxiliary power consumption (id) gross plant output (ie) fuel consumption (if) gross generation & net generation. Technical specifications for computerized equipment and software for implementation of the services outlined herein shall be proposed by the O&M Operator to the Owner for approval and implemented by the O&M Operator starting from the Mobilization Period and completed within six (6) months of the Handover of the Plant. O&M Operator shall also review the existing software systems and suggest measures to enhance functionality to maximize generation and availability;

6.4.10 prepare designated storage areas to receive, record and store all consumables, tools and Spare Parts. Prepare the designated workshop to carry out Minor Repairs for smooth operation and maintenance of the plant;

6.4.11 development of Standard Operating Procedures for human resources, operations, and safety ("SOPs") by the O&M Operator based on its prior experience within the Mobilization Period. The SOPs may be reviewed, monitored and modified by mutual agreement, as required, during the Term;

6.4.12 development of scorecards and Management Information System for the Performance Parameters, measurement of the effectiveness of this O&M Agreement, safety standards, housekeeping standards, discipline standards and attendance shall be designed and developed by the O&M Operator based on its prior experience within the Mobilization Period. These may be reviewed, monitored and modified, by mutual agreement, if required, during the Term;

6.4.13 engage all Sub-Contractors, in accordance with the procedure and subject to the conditions set out hereunder and complete all documentation, including execution of Sub-Contracts, required in this regard.

6.4.14 maintaining the Performance Bank Guarantee as per (Section 12.1);

6.4.15 maintenance, control and storage of inventory. Procure or cause to be procured, as defined in the O&M Responsibility Matrix, and receive, stock, utilities, water, coal and secondary fuel, Spare Parts, tools, supplies, chemicals, lubricants and other consumable materials. It shall be the responsibility of the O&M Operator to plan and prepare the Spare Parts required for every Contract Year and provide the indents for the same in sufficient time to the Owner's Staff so that the Spare Parts are available on-site at the required time. For each Contract Year, the O&M Operator shall provide the first estimate of the budget by substantiating the budget for the Spare Parts ("Spares Budget") with existing benchmarks (such as those issued by the CERC and/or from the O&M Operator's prior experience in developing such benchmarks both for itself as well as for others) from around the world for plants having the same Rated Capacity and other features as the Plant. The Spares Budget will be arrived at by mutual agreement between the Owner and the O&M Operator. If a mutual agreement is not reached, the Owner's decision regarding spares procurement for each Contract Year shall be final and binding. It shall be the responsibility of the O&M Operator to document in writing and have certified by the Owner, the list of Spare Parts and the corresponding Spares Budget for upcoming financial year, before 15$^{th}$ January of every Year. In case of the requirements for Spare Parts exceeding the mutually agreed ceilings due to the negligence of the O&M Operator, the O&M Operator shall have to pay for the excess consumption;

6.4.16 ensuring the safety of the Plant and all of the Plant O&M Staff, and other personnel employed by O&M Operator for the Service and other individuals and invitees who are at any time on the Plant, including through the development and observance of an appropriate safety program;

## 6.5 SERVICES TO BE PROVIDED DURING PLANT OPERATING PERIOD

In addition to such of the continuing Services to be performed prior to the Plant Operating Period, and without prejudice to the generality of anything stated elsewhere in this agreement, during the Plant Operating Period, the O&M Operator shall perform the following Services:

6.5.1 Plant-inspections, including routine inspections, performance monitoring and management of daily and preventive maintenance, periodic scheduled inspections, scheduled planned maintenance, major maintenance and overhauls for the Plant, including of labour, consumables and chemicals as set out in this agreement and as envisaged by the Annual Operating Plan and Five Year Rolling Maintenance Plan;

6.5.2 performance of unplanned Repairs and maintenance;

6.5.3 direction, supervision and training of the Plant O&M Staff in the operation, maintenance and repair of the Plant pursuant to and in accordance with this O&M Agreement;

6.5.4 except as otherwise provided herein, procurement of all equipment, goods and materials required to operate and maintain the Plant, including but not limited to, other consumables, chemicals, uniforms, tools, office and laboratory equipment, and office supplies, vehicles and mobile equipment, but excluding Spare Parts for equipments, coal and secondary fuel for the Plant;

6.5.5 maintenance, control and storage of inventory. Procure or cause to be procured, as defined in the O&M Responsibility Matrix, and receive stock, utilities, water, coal and secondary fuel, Spare Parts, tools, supplies, chemicals, lubricants and other consumable materials. It shall be the responsibility of the O&M Operator to plan and prepare the Spare Parts required for every Contract Year and provide the indents for the same in sufficient time so that the Spare Parts are available on-site at the required time. For each Contract Year, the O&M Operator shall substantiate the budget for the Spare Parts ("Spares Budget") with existing benchmarks (such as those issued by the CERC) from around the world for plants having the same Rated Capacity and other features as the Plant. The Spares Budget will be arrived at by mutual agreement between the Owner and the O&M Operator. If a mutual agreement is not reached, the Owner's decision regarding spares procurement for each Contract Year shall be final and binding.

6.5.6 operation and maintenance of metering equipment, weigh bridges and inspection by itself or a third party engaged by it, calibration including calibration of electrical metering, weigh bridges, equipment and devices, metering and tests as may be required by this O&M Agreement.

6.5.7 O&M operator shall be responsible for planning of O&M spares, they should dedicate a team for development of indigenous spares by doing reverse engineering from the reputed vendors. They shall also be responsible for quality certification of the spares/equipments at owner's premises/TSPL site. Indenting of the spares shall be done by the O&M operator which shall be approved by the TSPL EIC for taking further action for procurement. Validation and correction of the item master is also the responsibility of the O&M contractor.

6.5.8 ensuring the safety of the Plant and all of the Plant O&M Staff, and other personnel employed by O&M Operator for the Service and other individuals and invitees who are at any time on the Plant, including through the development and observance of an appropriate safety program;

6.5.9 attending meetings with any Competent Authority relating to the operation and maintenance of the Plant or to any Permit or any application thereof;

6.5.10 taking all action reasonably necessary in the circumstances to protect the Plant from possible damage associated with or caused by electrical disturbance or faults caused by the operation, faulty operation or non-operation of the SEB's facilities;

6.5.11 to the extent not inconsistent with the technical limits and safety of the Plant and Prudent Utility Practices, to operate and maintain the Plant in a manner that does not have an adverse effect on voltage level or frequency of the SEB;

6.5.12 operation of the Plant so as to achieve the Guaranteed Performance Parameters set forth in section 8;

6.5.13 as and when reasonably required by the Owner, to perform or cause to be performed tests and to provide the Owner with written reports on the results thereof;

6.5.14 notification to the Owner, within twenty-four (24) hours, of the discovery of any unusual adverse operating condition or characteristic which cannot be immediately corrected by the O&M Operator;

6.5.15 to establish and follow commercially reasonable procurement procedures approved by the Owner in its reasonable judgment to procure on behalf of the Owner all equipment used at the Plant in case of emergency;

6.5.16 to monitor the quality, quantity and cost of all goods, services and materials which are Operating Costs;

6.5.17 to extend all reasonable co-operation to the EPC Contractors during warranty repairs and attending of punch list items;

6.5.18 after Handover of all the Units, to handle and manage all ash and waste, as defined in the O&M Responsibility Matrix, excluding waste generated by the activities of EPC Contractors or any other contractor (other than a Sub-Contractor), generated by or used in the operation of the Plant, as the case may be and compliance with all Directives in connection therewith;

6.5.19 the O&M Operator will take over the systems and equipments of the Plant. It is the responsibility of the O&M Operator to ensure that all the required staff/resources are available at the time of Handover of total Plant so as to be able to appropriately takeover and commence Services in relation to Station handed over;

6.5.20 to administer on a day-to-day basis contracts entered into by or on behalf of the Owner for waste handling, transportation and disposal, security for the Plant, as defined in the O&M Responsibility Matrix, transportation of personnel, labour agreements and the Agreements as applicable;

6.5.21 to notify the Owner within twenty-four (24) hours upon obtaining knowledge of any potential warranty claim which may be brought by the Owner against any EPC Contractor under the EPC Contracts or against any other manufacturer, contractor or vendor providing services, materials or equipment for the Plant (including any warranties in effect with respect to any Unit), prepare information as requested or directed by the Owner related to Plant operations and costs required by the Owner to assert such warranty claims and assist the Owner in asserting and prosecuting such claims. Owner shall give to prosecutor proper feedback related to the warranty notified by O&M Operator;

6.5.22 to notify the Owner promptly upon obtaining knowledge of any event or casualty which may be claimed under any insurance policy maintained by the Owner or the O&M Operator pursuant to this O&M Agreement or any of the other Agreements;

6.5.23 to prepare information as reasonably requested by the Owner related to Plant operations and costs required by the Owner;

6.5.24 to submit insurance claims, and assist the Owner in submitting and pursuing such claims;

6.5.25 to administer and perform on a day-to-day basis all functions required of the Owner under the Agreements;

6.5.26 to, in accordance with the fuel management plan notified from time to time by the Owner, manage unloading, handling, storage of all coal and management of coal transportation from the track hopper/coal yard within the Plant boundary to the boilers and to manage coal stocks up to the design-capacity of the Plant's coal

stockyard and to manage the coal stockpile, in each case so as to minimize losses and degradation of coal, including from windage and runoff spoilage;

6.5.27 to perform on a day-to-day basis all functions required by the Owner pursuant to the terms of the Agreements for scheduling unloading, handling, storage of coal as well as secondary fuel and monitor the inventory of coal and secondary fuel as required, to operate the Plant. The O&M Operator shall notify the Owner immediately any Unit or the Plant as a whole is operated on Secondary Fuel, except during the Stabilization Periods for each Unit;

6.5.28 to prepare and submit to the Owner O&M Manuals, Annual Operating Plans, Annual Budgets and Five Year Forward Maintenance Plan, prior to Jan 15 of each calendar year in accordance with the provisions of this O&M Agreement and establish plans and implement procedures for predictive and preventative maintenance so as to maximize equipment and plant reliability, efficiency and availability;

6.5.29 to provide, legal, payroll and accounting services with respect to the Plant O&M Staff;

6.5.30 to assist the Owner, as reasonably appropriate, with any community or public relations activities that the Owner may undertake;

6.5.31 to operate the Plant in accordance with the Dispatch Instructions;

6.5.32 to develop, implement, adopt and use quality management systems and statistical techniques for Total Productive Maintenance and Mean Time between Failure Analysis;

6.5.33 to take all steps in order to maintain for the Plant ISO 9000, ISO 14000 and OHSAS 18000 quality accreditation, ISO 39001, ISO 50001 as defined in the O&M Responsibility Matrix immediately from the Handover of the Plant such certificates in place; Further O&M operator to implement if owner wants to implement any of other ISO/quality systems certification and cost of the audits by concern authorities and cost of certification will be reimbursed.

6.5.34 to assist and cooperate with the Owner, as and when requested by the Owner;

6.5.35 on the fifth (5th) Business Day of each month, to prepare and submit to the Owner monthly invoices for capacity and/or energy made available to the Owner from the Plant under the O&M Agreement during the preceding month, together with relevant supporting documents and information reasonably satisfactory to the Owner (including the cumulative Deemed Generation, Deemed Availability and other Performance Parameters as specified in section 8 with the supporting calculation of bonus and Liquidated Damages);

6.5.36 to prepare and implement daily log sheets and documents for faults (including root cause analysis and action flows for resolving such faults), outages (including root cause analysis and action flows for resolving such faults), materials and consumables usage, Plant performance, accounting books and records of the Plant;

6.5.37 obtain and maintain Permits required to be obtained by the O&M Operator in order to carry out the Services;

6.5.38 provide on-going and refresher training on-Plant in power station operation and maintenance for all Plant O&M Staff;

6.5.39 monitor, in accordance with the procedures established pursuant to this O&M Agreement, the quality and quantity of water, Coal and Secondary Fuel, and

manage deliveries of Coal within the Plant and, ensure receipt of and receive, unload, store and account for the inventories of Coal and account for the inventories and receive Secondary Fuel at the Plant Secondary Fuel Storage tank;

6.5.40 prepare, update and maintain on a daily basis a work order system and Tag-Out Documents;

6.5.41 prepare, update and obtain written approval from the Owner on a daily basis regarding the Deemed Generation, Deemed Availability and other Performance Parameters as specified in Article VI with supporting calculation of bonus and Liquidated Damages, including all the necessary supporting documentation

6.5.42 manage outages in a manner that is consistent with optimized cost, the obligations of the Owner, best utilization of labour, and parts, and optimization of productivity;

6.5.43 be responsible for good housekeeping, cleanliness, and preservation of any environmentally protected areas of the Plant;

6.5.44 provide first aid equipment for on-site emergency medical treatment;

6.5.45 prepare the Plant and systems for inspections and allow inspections of the Plant by Competent Authorities;

6.5.46 establish and maintain good relations with the local community;

6.5.47 perform all other obligations of the Owner under the Agreements relating to the operation and maintenance of the Plant; provided, however, that to the extent the performance of any such obligation, (i) is not necessarily related or incidental to any of the foregoing and (ii) could not reasonably have been foreseen in connection with any of the foregoing as a necessary component or aspect thereof, such obligation shall be treated as Additional Services;

6.5.48 Owner shall prior to the beginning of each year, month and day provide to the O&M Operator a written estimate of Owner's anticipated dispatch requirements for such, year, month or day or as required by relevant authorities and Owner, as the case may be, taking into account of Dependable Capacity as defined in section 8 and other terms and conditions of this O&M Agreement. Any such written estimate, delivered to the O&M Operator in good faith and notwithstanding that the O&M Operator may question the validity of the reason underlying any Dispatch Instruction under this clause 6.5.48, the O&M Operator will nevertheless comply with such Dispatch Instruction. Any Dispute regarding the proper issuance of any Dispatch Instruction to back down or resume generation and the recovery of any costs or damages incurred or suffered by the O&M Operator in complying with any Dispatch Instruction not properly issued hereunder shall be resolved mutually or as agreed during final discussion.

6.5.49 the O&M Operator is responsible for setting up all the required software systems to operate the Plant as per Prudent Utility Practices;

6.5.50 Any modifications to the Plant for the improving its operations or maintenance or performance parameters as well as the life cycle of the Plant shall be suggested by the O&M Operator. It will be for the Owner to decide whether any such modification shall be carried out. If the Owner decides in favor of carrying out the suggested modifications, the O&M Operator will provide assistance in this regard including assistance for basic engineering. All the costs incurred towards such modifications will be reimbursed by the owner and the deliverables of all

such projects will be incorporated in performance parameters guarantee of respective parameters

6.5.51 for indigenization of components or for those components for which engineering drawings are not available, the O&M Operator will engage the available manpower to develop such engineering drawings as are suitable to guide a potential manufacturer, subject to applicable laws, to indigenize a particular component or Spare Part. If any reverse engineering is required, such detailed engineering services shall also be arranged by O&M Operator.

6.5.52 operating and maintaining the Plant so that the Plant operations and features are in compliance with applicable Environment Laws, statutory requirements and other Directives and obtaining and maintaining Permits in this regard to the extent required on the part of the O&M Operator under the O&M Responsibility Matrix.

6.5.53 update the Plant drawings on a regular basis to ensure that they are always maintained in a current state

6.5.54 upon the receipt of a Termination Notice, the O&M Operator shall familiarize the replacement staff appointed by the Owner in the services with the operation and maintenance procedures of the Plant in accordance with the standards prescribed herein for the O&M Operator in order to assure a safe and smooth transfer of the Plant to the Owner or any other person nominated by the Owner.

6.5.55 Without limiting the other provisions of section 6, the O&M Operator shall notify the Owner by telephone as soon as reasonably practicable, and in any case, within eight (8) hours and in writing within twenty-four (24) hours of the occurrence of any Emergency Event and take prompt action in an effort to prevent any threatened damage, injury or loss to the Plant or persons or property located on or in the vicinity of the Plant.

6.5.56 All the obligations under Factory Act for O&M staff

6.5.57 O&M operator shall bring necessary management tools/systems for efficiency improvement/diagnostics of the system towards operation cost reduction/reliability improvement of the system.

## 6.6 SCOPE OF WORK FOR HR SERVICES

The intent of outsourcing is that all functions related to day today transaction shall be in the scope of contractor. However, for each critical function agency shall take approval/ clearance from TSPL functional Head. Compliance and insurance of contractor's their associates shall be scope of Contractor. Contractor must provide daily and regular MIS in agreed format. Regular review will be taken by the respective functional head of TSPL.

The SOW shall include following:

6.6.1 TSPL maintains a biometric based gate pass management system, which shall be handed over to the contractor, who shall ensure its operation and maintenance thereafter. Issuance, monitoring and compliance of Gate Management shall be in the scope of Contractor. Contractor must take approval of entry of Gate Passes from TSPL authorised representative. MIS to be generated and shared with the principal employer in the agreed formats and frequency.

6.6.2 Statutory Compliance: All obligation related to labor cum statutory compliance as applicable under the various laws including but not limited to factories act, contract labor act, pf, gratuity, bonus, etc. and any amendment thereof shall be in

the scope of contractor. However, all such compliances must be ensured in concurrence with TSPL. Contractor shall ensure coordination of time to time audits, inspections and visits by the Government / Statutory authorities and ensuring 100% compliance including upkeep of statutory documents registers applicable under various acts. In case of any findings / Non-compliances during such visits contractor shall ensure coordination of compliance with statutory authorities. The above shall be in the scope of contractor with the support of TSPL.

6.6.3 Contractor shall follow, comply and abide by all the policies and guidelines issued by TSPL time to time. A copy of the same shall be provided to the contractor.

6.6.4 Contractor shall support and coordinate with TSPL for peaceful and harmonious industrial relations environment both within and outside the factory premises including coordination and maintaining appropriate stakeholder relationship including harmonious social environment to ensure uninterrupted operations of the plant.

6.6.5 The Contractor shall be responsible to ensure security of all the assets including but not limited to equipment, spares, scrap and all other items lying at site. Contractor shall be responsible for deployment of manpower for the purpose of securing assets as deemed necessary. Any loss of material shall be reported immediately. Contractor shall be responsible to register any case with respect to the loss of property/ theft with police and applicable concerned authorities.

6.6.6 Housekeeping, maintenance, upkeep of all the building inside the plant premises shall be in the scope of contractor. This includes but is not limited to office infrastructure, office buildings, main gate, residential building/ guesthouse, transportation, etc. TSPL may retain some of the facilities including office/ residential space, etc. as mutually agreed. Operation & Maintenance of STP installed at TSPL Hostel shall be in the scope of contractor.

6.6.7 Operation & Maintenance of onsite Cafeteria, canteen, pantry at work locations, necessary transportation, etc. across site shall be in the scope of contractor.

## 6.7 SERVICES DURING DE-MOBILIZATION PERIOD

6.7.1 The O&M Operator shall, as soon as reasonably practicable during the De-mobilisation Period:

6.7.2 prepare and hand-over to the Owner an updated inventory list of all consumables, Spare Parts and equipment forming part of or being the subject of the Services which are the property of the Owner;

6.7.3 hand-over to the Owner, equipment, machinery, and materials belonging to the Owner in fully working condition, normal wear and tear excepted, as shown in the latest inventory list notified by the O&M Operator to the Owner;

6.7.4 remove all of the O&M Operator's tools, equipment and materials brought by O&M Operator from the Plant (which are not identified on the updated inventory list);

6.7.5 hand-over to the Owner an updated Spare Parts stock list taking into account all additions and deletions during the term of this O&M Agreement;

6.7.6 deliver to the Owner all then-existing materials and documents;

6.7.7 remove all its staff and those of its Sub-Contractors (once the replacement staff appointed by the Owner is in charge as per Section 6.5.52) except as otherwise instructed by Owner. O&M Operator shall be solely liable for resettlement, compensation or any other obligations in respect of the O&M Operator's staff. O&M Operator shall keep the Owner indemnified against claims, if any, pertaining to its staff;

6.7.8 O&M Operator shall settle all dues, recoveries, insurance claims, if any, with the Owner;

6.7.9 prepare and handover all the records such as, but not limited to, Plant performance, logs and history data of the equipment which may or may not be part of day to day report in hard and soft copy;

6.7.10 be strictly liable to ensure that all the Sub-Contractors are terminated and vacate the site premises along with the O&M operator unless specified otherwise by the owner;

6.7.11 remove from the site premises all petroleum, waste materials, rubbish and other debris to an area near the site premises vicinity designated by Owner, as well as all tools, construction equipment, machinery and surplus material to which Owner does not hold title, and shall leave the site premises area in a neat, clean and usable condition. The O&M Operator shall remove, transport and dispose of any hazardous material transported onto the site premises by the O&M Operator, or created, used or handled as part of O&M Operator's construction activities at the site premises. O&M Operator shall notify Owner immediately upon the discovery of the presence of any hazardous material on, or the release of hazardous material on or from, the site premises. All clean-up and disposal activities of O&M Operator (including, without limitation, the transportation and disposal of any hazardous materials taken from the site premises) shall be conducted in accordance with all applicable laws and applicable permits.

6.7.12 O&M Operator shall ensure the settlement of all related to payments due to Sub-Contractors and submit no claim certificates as per the format of the Owner.

## 6.8 REVIEW BY THE OPERATOR OF DESIGN, SPARE PARTS LISTS AND MANUFACTURERS' MANUALS

6.8.1 As and when reasonably directed by the Owner, the Operator shall review any drawings, data and other design materials provided to the Operator by the Owner or the EPC Contractor which relate to the design, construction, operation or maintenance of the Plant. The Operator shall also observe and examine the construction of the Units, any Additional Facilities, and other items constructed by the EPC/ Other owner appointed Contractor, in relation to the operation, maintenance and repair of the Plant. The Operator shall conduct its review diligently in accordance with the standards of performance contained in Section 6.2, and the Operator shall provide the Owner with written comments on such materials and observations, including any recommendations for modifications to the design or construction of the Units, any Additional Facilities and any other items

constructed by the EPC Contractor within [ten (10)] days after receipt or observation of the same by the Operator. The scope of the Operator's review of such materials shall be limited to examining such materials for conformity to Prudent Utility Practices, potential improvements in Plant reliability, availability and performance and potential measures to lower the cost of providing or operating and maintaining the Plant and/or performing the Services.

6.8.2 The Operator shall confirm that the EPC Contracts and any designs reviewed by the Operator under Section 6.8.1 are sufficient, if complied with, to deliver a Plant that, if operated and maintained in accordance with this Agreement, is capable of operating at the performance and efficiency levels and within the cost parameters and budgets (based upon costs and expenses as of the date hereof) provided in and contemplated by this Agreement.

6.8.3 Without derogating from or limiting the responsibilities and obligations set forth in Section 6.8.1, the Operator shall review the Owner's list of available Spare Parts within thirty (30) days after receipt of the same from the Owner, and the Operator shall provide to the Owner written comments and recommendations on such lists for the initial supply of such Spare Parts consistent with Prudent Utility Practices and the Operator's other obligations under this Agreement.

6.8.4 The Operator shall maintain, make recommendations regarding and update

6.8.5 Spare Parts lists from time to time during the Term in consultation with the Owner. Changes to Spare Parts lists not specifically contemplated by the relevant Annual Budget that exceed the limitation of Operator's authority shall require the prior written consent of Owner, which shall not be unreasonably withheld.

6.8.6 As and when directed by the Owner, the Operator shall review and familiarize itself with the Manufacturers' Manuals (and any drafts thereof). The Operator shall provide the Owner with written comments and recommendations on such Manufacturers‟ Manuals within [twenty-five (25)] days after receipt of the same from the Owner or the EPC Contractor.

6.8.7 The Operator shall notify the Owner by telephone as soon as reasonably practicable, and in any case, within One (1)] hour and in writing within Four (4)] hours of the occurrence of any Emergency Event and take prompt action in an effort to prevent any threatened damage, injury or loss to the Plant or persons or property located on or in the vicinity of the Site.

## 6.9 O&M MANUALS

### 6.9.1 Preparation of O&M Manuals

The Operator shall prepare and submit to the Owner: (i) [six (6)] complete sets of a preliminary draft of the O&M Manuals for review and comment by the Owner during mobilization period (ii) [six (6)] complete sets of a final draft of the O&M Manuals for review and reference by the Owner immediate after Plant takeover and (iii) [six (6)] complete sets of the final O&M Manuals for review and

reference by the Owner immediate after Plant takeover. All the above shall be submitted in soft copy as well.

6.9.2 Guidelines for O&M Manuals

The O&M Manuals shall include and [be based upon] the Manufacturers‟ Manuals, when available, provided by the EPC Contractor and other procedures with respect to, among other things, the operation of the Plant, safety, maintenance, records, and environmental reporting. Procedures and conditions for the operation, maintenance and repair of the Plant and the performance of the Services by the Operator contained in the O&M Manuals, shall be in accordance with, among other sources, (i) all applicable Directives, (ii) Prudent Utility Practices, (iii) an Agreement, and the other Plant Agreements, (iv) the operating rules and procedures of PSPCL and the PSPCL system, (v) applicable EPC Contractor's, subcontractors‟, and vendors‟ manuals and Manufacturers‟ Manuals and warranties, and (vi) the requirements of the O&M Agreement.

6.9.3 Review, Comment and Approval of O&M Manuals

If the Owner determines that the O&M Manuals submitted by the Operator pursuant to Section 6.9.1 are complete, accurate and in accordance with the standards set forth in Section 6.9.2, then the Owner shall notify the Operator of the Owner's acceptance of such O&M Manuals. If the Owner reasonably determines that such O&M Manuals are not complete, accurate or in accordance with the standards under Section 6.9.2 in any respect, the Owner shall, provide written comments on such O&M Manuals to the Operator stating the Owner's reasons for its disapproval of, and any proposed revisions to, any portion thereof. The foregoing review and approval procedure shall apply equally to each revision of the O&M Manuals submitted to the Owner.

## 6.10 FIVE YEAR ROLLING MAINTENANCE PLAN

6.10.1 On or prior to 30 days of each Contract Year, the Operator shall prepare and submit to the Owner the Five-Year Rolling Maintenance Plan, detailed on a Monthly basis, and shall set forth, in form and substance reasonably acceptable to the Owner:

6.10.2 expected operations, repairs, capital improvements, teardowns and major overhauls;

6.10.3 routine maintenance and overhaul schedules; data regarding other work proposed to be undertaken by the Operator; and

6.10.4 Projected yearly budgetary requirements for the subject matter of Section 6.10.1. to Section 6.10.3. In preparing and providing the Five-Year rolling Maintenance Plan, the Operator shall apply the standards of performance

provided in Section 6.2 and make such plans consistent with the availability requirements in this Agreement.

6.10.5 Upon receipt of comments from the Owner on the Five-Year

6.10.6 rolling Maintenance Plan, the Operator shall incorporate the Owner's comments, discuss and resolve with the Owner any differences, and on or prior to the date that is fifteen (15) Business Days following the receipt of the Owner's comments, finalize and submit to the Owner a final Five-Year rolling Maintenance Plan.

6.10.7 The Owner and the Operator shall meet, if necessary, promptly after all or any aspect of a Five-Year rolling Maintenance Plan shall have been disapproved, in order to agree upon a final Five-Year rolling Maintenance plan.

6.10.8 Any actions proposed under the Five-Year rolling Maintenance

6.10.9 Plan shall be consistent with the O&M Manuals and the Operator's obligations set forth in an Agreement. The Operator shall notify the Owner as soon as reasonably possible of any significant deviations or discrepancies from the Projections contained in the Five-Year rolling Maintenance Plan. The Five-Year rolling maintenance plan shall be reviewed as frequently as proposed by the Owner from time to time and in no case more than 6 (six) months.

## 6.11 MAINTENANCE PLAN

6.11.1 Preparation of report for preventive Maintenance, Predictive Maintenance Trend and Analysis report, Inventory Consumption, Plant Availability/Down Time, Failure Analysis, Preventive Maintenance Effectiveness and specific consumption etc.

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

6.11.3 Devising maintenance strategy based on Equipment Criticality Analysis to establish best practices of preventive maintenance, and condition based maintenance.

6.11.4 Planning and scheduling of maintenance jobs.

6.11.5 Executing maintenance task of Preventive Maintenance / Lubrication Schedule.

6.11.6 To carry out the predictive maintenance / opportunity maintenances.

6.11.7 To carry out reliability based condition monitoring maintenance.

6.11.8 To carry out turnaround maintenance.

6.11.9 Carry-out repairs and replacement of the equipment under the instruction / supervision.

6.11.10 Ensuring optimum Plant / Equipment availability for the operations.

6.11.11 Quality workman ship for the Operation & Maintenance work carried out for the TSPL.

6.11.12 Periodic maintenance reports as per the following

Daily report
Weekly Report
Monthly Report
Annual Report

## 6.12 SUB-CONTRACTING

The O&M Operator shall not sub-contract the whole or part of the Services or the whole of its obligations under this O&M Agreement, whether to one or more parties without permission of owner.

Sub-contracting of any of its obligations under this O&M Agreement by the O&M Operator shall not in any manner relieve the O&M Operator of any of its duties, liabilities or obligations under this O&M Agreement.

The O&M Operator shall not be permitted to enter into any Sub-Contracts without the prior written consent of the Owner, provided that such consent shall not to unreasonably withheld or delayed. The Owner may require, as a condition to such consent, that any Sub-Contractor under a major Sub-Contract enter into a direct agreement with the Owner and lenders/agents or trustees of the lenders of the Owner.

Un priced copy of all sub contract shall be submitted to owner immediately after signing/ ordering of such sub contracts by O&M operator with all terms and conditions

All sub-contracts entered into by the O&M Operator in relation to this O&M Agreement shall expressly permit assignment of all rights and obligations of the O&M Operator thereunder to the Owner or its nominee on the issuance of notice in this regard by the Owner to the Sub-Contractor.

The O&M Operator shall ensure that all Sub-Contractors maintain insurance similar to that required to be maintained by it under Section 9.2

## 6.13 NATURE AND SCOPE OF WORK

The following scope is a minimum and is not an exhaustive scope.

### *6.13.1 MECHANICAL SYSTEM*

***PUMPS***

Overhauling of the pump: Cleaning, replacement of lubricating oil, replacement of gland packing/stuffing box/shaft sleeves/bolts and nuts/fasteners/pipes/gaskets/bearings/pump spare parts/valves/couplings/shaft guards/alignment and leveling of the pump with its driving equipment, taking trial running of the pump to the satisfaction.

Preventive Maintenance, Break down Maintenance, planned and predictive maintenance of Pumps and overhauling of pumps is a part of scope. Minor Modification of any Piping including civil is a part of scope for betterment of operational and maintenance requirement. Regular centrifuging of Oil used in pumps (like BFP, Mills hydraulics etc) maintaining the oil purity level as per ISO/NAS norms and maintenance of centrifuge. Repair of any component of the pump.

COMPRESSOR

Overhauling: Cleaning, replacement of lubricating oil, replacement of drive /oil and air filters, inspection of compressor internls/ screw inspection/ replacement /repair of internals/heat exchanger/air receiver pressure and temperature indicators etc., and boxing up, alignment to the drive equipment etc. and taking trial run of the compressor to the satisfaction.

AIR DRYER

Overhauling and Cleaning and repair/replacement of valves, desiccant/refregerant /expansion valves/compressors/ fasteners/pressure and temperature gauges/moisture trap/heat exchangers/piping etc. and taking trial of the dryer to the satisfaction.

BOILER

Periodical/Routing inspection and repair of pressure parts/overhauling of valves/oil and coal burners, flame detection scanners, igniters and its adjustments/soot blowers and its operating mechanisms/carriages gearboxes/lubrication/overhauling/repair of gauge glass/ fasteners/arresting leakage of piping Tubing/blow down tanks etc., and restoration of insulation and cladding.

- **Valves:** Repair/Replacement/ preventive maintenance of all types of valve including safety valve. Floating and adjustment of the Blow down, Popping and relieving pressures as per recommendations. overhauling and re conditioning of all valves for improving the performance (Easy operation, rectification of passing and gland leakage, and improving the reliability) includes cleaning, lapping, blue matching , Machining of valve components like seat and disc etc and hydraulic test of seat and bonnet of gate, globe, bonnet less and pressure seal bonnet type etc.

- **Coal/Oil Burners**: Repair / Replacement/overhauling of any part or in whole/Hard facing/alignment/Preventive maintenance of Coal burner/LDO/HFO guns assembly

- **Pressure parts**: Thorough inspection (physical and NDT i.e. Thickness Measurement), cleaning (internal and external) and replacement/repair of Boiler pressure parts which includes super heater tubes/re heater tubes/water wall tubes/Economizer/LTSH/Steam cooled walls/screen tubes/all the interconnecting pipes and headers and the valves connected to the various parts of the boiler. Repair/replacement of Drum level gauge glass

- **Soot Blower**: External & internal cleaning of wall blowers & LRSB. Inspection Repair/Replacement/lubrication/overhauling of any part or in whole soot blowers like rack & pinion/sprockets/lance tube /feed tube/nozzle/poppet valve/motor/ coupling/gearbox. Oil and steam leakages to be checked and arrested.

- **BOILER TUBE REPAIR/REPLACEMENT & HYDRO TEST**
  - Engage IBR class welder (certified IBR welder with TIG welding experience and having valid license for welding of carbon steel and alloy steel from the competent authority.
  - Mobilize necessary manpower and materials for scaffolding for attending the tube repair/replacement work.
  - Arrangement and shifting of scaffolding, sky climber materials, gratings, cutting set, grinding machine, argon set and welding machine etc and any other required materials to the required location of the boiler for attending the job.
  - Do thickness survey of failed tube or adjacent tube
  - Prepare bends to the required angle from straight tube for replacement if required.
  - Erect scaffolding and assemble sky climber depending upon the location of the job in the boiler.
  - Mobilize manpower for assistance in carrying out hydro test after completion of the jobs for inspection by inspector of factories and boiler.
  - Carry out the radiography and stress reliving
  - Checking of inside of the boiler both first pass & second pass after completion of hydro test for any defect.

- **Misc** :
  - CAVT (cold air velocity test) of boiler to be done during o/h.
  - The contractor shall arrange for specialized services as & when required for On-line leak sealing /valve internal machining/ Radiography/etc
  - Repair/replacement of peep hole and manhole doors
  - Repair/replacement of all hanger supports of pipes and ducts

<u>ID/FD/PA FANS</u>

Cleaning, replacement of lube oil/cooling water gaskets cleaning/inspection of rotor/runner/shaft/bearing/coupling/housing/casing/ducting/fasteners/dampers/ operating mechanisms and replacement of the above as and when required/alignment and leveling of machines with its drive equipment etc., to the satisfaction. Hard facing / HVOF coating/ replacement of Impeller. Static and Dynamic balancing of the impeller as and when required

<u>AIR PREHEATER:</u>

Cleaning/Repair/Replacement/PM/Overhauling/Inspection of Guide & Support Bearing/all type of seals like radial, axial, bypass, rod post etc/soot blowers & its

piping/water washing piping/Gearbox. Replacement of baskets / Rotor leveling. All kind of leakages to be arrested Hard facing of any part as and when required

DUCTS, DAMPERS AND GATES:

Cleaning/Repair/Replacement/Overhauling/PM of all the gates ducts and damper or of any part it like bearings/gland/ seals /louvers/shaft/bearing housing etc

Hard facing of any part of ducts gates and damper as and when required

COAL MILL

Cleaning, inspection/replacement/overhauling of lubricating oil/overhaul of lube oil station/heat exchangers/gearboxes/inspection/replacement/adjustment of mill internal like grinding rings/balls/springs/Hydraulic power pack/vanes/bolts & nuts/ fasteners/coupling, leveling and alignment with drive equipment etc., and trial run to the satisfaction.

1. Total maintenance of mechanical equipments of Mill and its auxiliaries
   a. Cleaning, inspection/replacement of lubricating/hydraulic oil
   b. Overhaul of lube oil station/heat exchangers/gearboxes
   c. Inspection/replacement/adjustment of mill internal like balls/liner plates/vanes/bolts & nuts/coupling, grouting if required, levelling and alignment with drive equipment etc., and trial run to the satisfaction.
   d. Regular purification/centrifuging of GB and hydraulic oil and centrifuge maintenance is with the agency.
   e. Modification of line/Equipment, Painting if required,
   f.Regular PM/Overhauling of equipment is in the scope of agency.
   g. The contractor will guarantee for the performance of the mill for the parameters like , oil/gas leakages, mill fineness and thru-put after major overhaul penalty will be applicable as decided by EIC
   h. Total Maintenance of all valves in mill area/Valve machining/
   i.Total Maintenance of Hydraulic and lube oil station

2. House-keeping, equipment cleaning and area cleaning of the whole mill bay after maintenance shall be in scope of contractor
3. Existing equipment storage sheds shall be handed over to contractor and any further maintenance shall be in contractor's scope.
4. Central Material Management shall be part of TSPL scope. Contractor will draw Material / spare parts from here, handling & transportation to work place for temporary storage / usage shall be in Contractor's scope. Segregation and Disposal of scrap to the scrap yard shown by the TSPL engineer in charge is in the scope of the contractor.
5. All other T&P irrespective of its nature being either special or general are in the scope of Contractor like hydraulic jack, puller etc.

6. Operation and Maintenance of the entire crane in the mill bay shall be in contractor's scope.
7. Equipment handling system and maintenance shall be in contractor scope.
8. Special equipment/vehicle required for mill maintenance, mill gearbox and any other mill parts or auxiliaries shifting within the plant for maintenance is in contractor's scope.
9. Contractor shall indicate manpower strength-category wise. Qualification and experience shall also be given
10. All consumables like all type of Rope, all types of Gaskets, nut and bolts etc are in contractor scope.
11. Maintenance and preparation of Mill overhauling is in contractor's scope
12. Timely PM of mill as per the Scheduled provide is in contractor's scope
13. Maintenance report, spare reconciliation report has to be provided on daily basis by the contractor.
14. Tracking of wear rate of crushing elements and thereby planning mill overhauling is in contractor's scope
15. All coal discharge pipe maintenance like, online leakage arresting, patch welding and replacement is in contractor's scope
16. Oil handling and oil purification to meet the required purity level suggested as per engineer in charge shall be in contractor scope.
17. Any metal built up or hard facing of any part of mill and its auxiliaries are in contractor's scope
18. Repair/replacement of coal pipe and bends. Online leakage arresting /patch welding to be done as and when required
19. Any kind of welding and cutting required is in contractor's scope. Availability of the welding machines and cutting sets and its maintenance shall be in contractor's scope
20. Arrangement for arresting online steam leakages is in contractor's scope.
21. Execution of any kind of modification required for improving the performance of mill and auxiliaries

COAL HANDLING PLANTS

Preventive, predictive and break down maintenance of Unloading station/wagon tripler, stacker declaimer, coal feeders/ conveyors/chutes/dust extraction, dust suppression system/fans fasteners/ducting/bag dust collectors/gear boxes/coal crushers/automatic coal sampling equipment / coal lab equipment etc., taking trial run of the above system to the satisfaction. Belt vulcanizing etc. will be in the scope of contractor.

ASH HANDLING PLANT

Maintenance of ash handling plant equipment, ash scrapper conveyors, crushers, ash slurry water pump, pneumatic ash conveying system, rotary air lock valves, motorized valves, piping, bag dust collector, exhaust fan, ash silo fluidizing system, ash unloading system, silo equipments, ash mixtures, rotary air lock valves, chutes, high concentration slurry pumps, piping up to ash dyke and bottom ash handling system etc.

ESP

Periodical inspection of ESP internals whenever required and necessary ,repairs of collecting electrodes, discharge electrodes, its rapping mechanism, gearboxes/hoppers/chutes/scrapper conveyor rotary air lock valves and bottom hopper fluidizing system and root blowers etc., and taking trial of the above machinery and plant to the satisfaction.

Preventive and break down maintenance of Bag filter, solenoid valve, bag replacement, cleaning of bags, Control system, PLC logic setting and maintenance, Electrical system and mechanical system.

DM PLANT

Overhauling of pumps, valves/ lubrication/ replacement of leader/ nozzles/valves /gaskets/ pipes/ arresting leakage of water, providing assistance to transfer the resins/sand/activated carbon for replacement or for internal inspection, repairs of acid/alkali storage tanks/pipe lines/valves/pumps/supports and chemical dosing system to boiler and providing assistance for acid / alkali unloading etc., and circulating water treatment.

CIRCULATING WATER PUMP HOUSE AND COOLING TOWERS

Overhauling of pumps/fan/gear box/lubrication of machinery/replacement of fills/repairing of PVC fittings/ repairing of precast concrete supports/ fasteners/drift eliminator/doors/valves/headers/nozzles/flanges repair and overhauling of chemical dosing system to C.W. system. Overhauling of pumps / gear boxes etc. of C.W by pass treatment (side stream filters) etc.

TURBINE AND AUXILARIES

Repairs and overhauling of turbine & its auxiliary equipment, pumps, oil centrifuge/lubrication system/oil coolers/ball cleaning system/condenser /fasteners/arresting leakage in the piping replacement of valves and piping etc. During operation of turbo-generator any deviations of parameter like vibration, HP/LP differential expansion, axial shift, top/bottom casing temp etc. needs correction has to be taken up by O&M operator which may need alignment, balancing, lifting of HP/LP casing, reworking of insulation, and generator rotor thread in, thread out etc.

The contractor shall arrange for specialized services as & when required for turbine balancing, Experts visit during turbine overhauling and On-line leak sealing /valve internal machining

OVERHEAD CRANES -EOT AND HOISTS

Preventive, predictive, routine maintenance and overhauling of EOT cranes and hoists inside the plant and its sub-assemblies (gearboxes, transmission shaft, couplings, rollers, hoist drum, ropes etc.)

ELEVATOR

Preventive, predictive, routine maintenance and overhauling elevator and its sub-assemblies (gearboxes, transmission shaft, couplings, rollers, hoist drum, ropes etc.)

Raw water pumping, pipe line, clarifiers, service water system and potable water system, waste water treatment plant and fire-fighting water system in the power plant

Preventive, predictive, routine and breakdown maintenance of these systems and its sub-assemblies.

HYDROGEN GENERATION STATION

The hydrogen generating system and its auxiliary equipment maintenance, repair, inspection, overhauling, replacement will be in the scope of contractor

FIRE FIGHTING SYSTEM

Checking of healthiness of all detection, alarm and fire quenching system at an interval of 7 days and rectification of the same if not in order.

FABRICATION AND ERECTION OF STRUCTURAL WORK:

The job involves fabrication & erection of structural, like platform ladders, handrails, supports, miscellaneous structural items etc. Fabrication & erection are carried out at different heights & various locations within plant premises.

The job covers transportation of fabricated structure to site & erection / assembly act. Assembly, bolting, welding, alignment etc. come in the scope. The contractor will do grouting. The contractor has to arrange the consumables like gas, electrodes, clamps tools & tackles etc.

REFRACTORY & INSULATION:

Insulation of boiler-headers, tanks, heat exchangers, ducts, fans, pent house, steam/oil/coal pipe lines, valves & pipes bends:

Scope of work includes removal of damaged sheet/ insulation, covering the pipe with preformed pipe section or light resin bonded mattress with one side wire netting. The insulation will be covered by aluminum sheet/GI sheet.

The repairing and application of damaged refractory in boiler and other areas will be in the scope of contractor.

MOTORS

Removing/Replacement/Rewinding/Transportation/Shifting/Alignment/Earth connections etc.

ON LINE SEALING

On-line leak sealing Steam and water etc., (Identification of exact leakage by removing insulation, scaffolding & preparatory jobs to carry out the work.)

REVERSE ENGINEERING

Drawing development of any equipment/system to be identified & completed within 01 year of effective start of the contract.

***TECHNICAL CONDITION***

The contractor shall arrange himself the tools and tackles including welding machines, gas-cutting sets. TIG welding sets, flexible grinding machine, hand drilling machines, pneumatic grinding machine, screw and hydraulic jacks, lifting tools and tackles (chain blocks, hook chuck, slings etc), hand lamps with transformer (24 V only) etc. for the routine maintenance and Owner shall provide only some special tools supplied by the EPC contractor. All contractor tools should have valid certification and proper history and records should be maintained for above lifting, hand and power operated tools in line with ISO systems.

### *6.13.2 **ELECTRICAL SYSTEM***

**SCOPE OF WORK**

400 KV SWITCH YARD:

Preventive, Predictive, Breakdown and Shutdown maintenance of GIS, Line, SCADA system, SF6 system, Insulators, Duct, Circuit Breaker, Isolator. Repair, Replacement of equipments/parts/defectives along with shifting-lifting-Loading-Unloading of material. CBM, Thermography, Testing of equipments.

Preventive, scheduled predictive, Breakdown & Shutdown maintenance of switch gears and replacement of insulators/SF6 & air pressure/megger values of the equipment/oil level in CT & PT/CVT/ICT/LA/Insulators /circuit breaker operation timings/interlocks/control and power circuits/isolator contacts/applying jelly in the isolators/tightness of all connections/removal of grass in switchyard/Closing and opening operation of isolators/earth pits & connections, meggering of earth pits, safety requirements. IR value testing, of all above items, change fasteners, oil testing, replacement of CT, PTS, Replace/Repair of any part of the above yard. CBM of all equipments, Thermography of OH line. Checking and maintenance of Fire-fighting system. Prepare and maintenance of check list daily and maintenance done during the shutdowns.

400 KV TRANSFORMERS

Routine, preventive, predictive, Breakdown & Shutdown maintenance of Power transformers:

Cleaning, Checking, repair and replacement of gaskets/oil seals/fasteners//bushings/fans & pumps/LA/Insulators/OLTC/OFFLTC/oil level in conservator, OLTC and bushing/gap setting of arching horns/oil filter/silica gel and breather/temperature controller/pressure relief diaphragm/testing of control and power connections/earth pits and connections/safety requirements, earth pits/NGR/Temperature measurements/meggering of earth pits/filtration of oil/replacement of oil/BDV/DGA of oil/SFRA, Checking and maintenance of Fire-fighting system, Hourly, daily, checks, periodic checklists, arresting oil leakage.

TRANSFORMERS

Routine, preventive, predictive, Breakdown & Overhauling maintenance of Power transformers:

Cleaning, Checking, repair and replacement of gaskets/oil seals/ fasteners/bushings/OFFLTC/oil level in conservator and bushings / silica gel and breather/temperature controller/pressure relief diaphragm/testing of control & power circuits/ meggering/BDV & acidity of oil/interlocks/trip and closing contacts/ventilation system / tightness of control and power connections/earth pits and connections/safety requirements, earth pits/NGR /Temperature measurements/meggering of earth pits/filtration of oil/replacement of oil. Arresting of oil leakages.

HT MOTORS

Preventive, routine, predictive, Breakdown maintenance & overhauling of HT motors: Cleaning, Checking, repair and replacement of lubricating oil/bearings/vibration/signature analysis/terminal connection/control and power circuits/tightness of power cable terminations/insulation/fasteners/winding resistance and inductance/interlock and trip contacts/cooling system/abnormal sound/rewinding/machining work for rotor shaft-housing-end covers and bearing temperature/Circuit Breaker operations/earth connections/control and power cable laying and jointing/safety requirements/Shock pulse monitor/Temperature measurements / Vibration measurement. Replacement of damaged parts, bearings PB, TB loops etc.

LT MOTORS

Preventive, routine, predictive, Breakdown maintenance & overhauling of LT motors : Cleaning, Checking, repair and replacement of lubricating oil or grease/bearings/ fasteners/vibration/terminal connection/control and power circuits/tightness of power cable terminations/insulation/winding resistance and inductance/interlock and trip contacts/cooling system and ribs/abnormal sound/ machining work for rotor shaft-housing-end covers/ winding and bearing temperature/Circuit Breaker or starter operations/earth connections/control and power cable laying & jointing /safety requirements/Shock pulse monitor/Temperature measurements/Vibration measurement/Rewinding etc.

DC MOTORS

Preventive, Scheduled, predictive, Breakdown & Shutdown maintenance of DC motors. Cleaning, Checking, repair and replacement of carbon brushes holders' air filter commutator drop test. IR value load and no load trials, repair/replacements of motors. DC panel power & control checking, clamping, repair and replacement of components.

OVERHAULING OF HT, LT & DC MOTORS

Dismantling/Assembling/Replacement of any damaged parts of above said equipment/Cleaning, checking, repair and replacement of lubricating oil or grease/bearings/vibration/ machining work for rotor shaft-housing-end covers/ re-wedging/ rewinding/ terminal connection/re lugging of terminations/tightness of power cable terminations/value of insulation winding resistance and inductance/cooling system and ribs/abnormal sound/carbon brushes/holders /air filter/commutator/Varnishing/drying in the ovens/painting/core test/no load test. Only Dr. Beck elmotherm2 FSO, elmoluth, Beckel grey, Beck red to be used for O/H. Motors end leads replacement as and when required with suitably sized "F" class insulated copper conductor. Repair of the end sleeves rotors / end covers.

## SWITCHGEAR PANELS AND LOCAL CONTROL PANELS

Preventive, routine, predictive, breakdown & overhauling maintenance of all switch gear panels and Low voltage panels (Local). Cleaning, checking, repair and replacement of control and power fuses/fixing and moving contacts/arching chutes/control and power circuits/insulation values of switch gear and bus/operation (close and open) of Circuit breaker, MCCB and contractor related interlocks/tightness of power and control circuits/load current/transducers/ammeters/energy meters/relays/CT/PT/ control transformer/earthing connections/control and power cable laying & jointing/safety requirements/bus duct, smoke detectors. Laying/Removing of Power and control cables as and when any modification, safety, maintenance requirement jobs are being done. Replacement of rubber bellows and maintenance of above mentioned bus ducts.

## CRANES

Preventive, routine, predictive and breakdown maintenance of EOT, Monorail, Hoists & Elevators : Cleaning, checking, repair and replacement of control and power fuses/fixing and moving contacts/arching chutes/control and power circuits/insulation values of switch gear and bus/Operation of contactors and MCCB/ interlocks/tightness of power and control circuits/load currents/ammeters/voltmeters/relays/control transformer/, timers/manipulator /limit switches/down shop leads / pantographs/cables/control and power cable laying & jointing indications/earthing/danger boards/safety Requirement.

## COAL HANDLING PLANT AND COAL YARD EQUIPMENT

Preventive, predictive, scheduled and breakdown maintenance of magnetic separators /diverters /gate motors/fabric collectors/conveyor motors/dust collectors & extraction/suppression system/coal crushers/tremblers/separators/automatic coal sampling equipment/control panels.

## PROTECTION SYSTEM

Cleaning, checking of all the relay and protective panels of 400 KV, 11KV and all voltage level system protection relays/instrument transformers and generator protection system. Check the tightness of control circuits/auxiliary supply / signal and protective relays/testing and calibration of protective relays/trip circuits/ earthings, once in a year. Calibration of Energy meters installed as per PSEB guidelines.

## CONTROL ROOMS

Periodical cleaning, checking, repair and replacement of GCP and ECP control panel elements/tightness of control circuits/AC and DC supply/indication bulbs/rotary switches/signal lamps/annunciators.

UPS, BATTERY AND INVERTER

Periodical maintenance of Battery, UPS and Inverter, Cleaning, checking of specific gravity/level of distilled water/individual battery voltages/tightness of battery leads and terminations/UPS, Inverter and Battery panels/control and power circuits/insulation values/fuses of control and power circuits/voltmeters/ammeters/control system of UPS, float and float cum boost chargers/ earthing /applying jelly. Testing with health monitoring kit, deep discharge test once in a year, trouble shooting.

ESP

Periodical cleaning and checking of all the HV and LV panels/rectifier transformers & oil test/compressors/tightness of control and power circuits/load currents of various equipment/relays and contactors/insulator, porcelain and hopper heaters/interlocks/ Microcomputer controller and settings/insulation of fields/earthing/ operation of ACB and contactors.

CHIMNEY LIGHTING, PLANT, OFFICE-GENERAL LIGHTING & EXHAUST FANS

Periodical replacement of fused bulbs, chokes, ballasts, starters, battery of entire lighting system. Cleaning and checking of fixtures/tightness of control circuits/photo lighting system/sockets, LDB/SLDB/Testing of ELCB and other portable equipment's regularly. Repair and replacement of plant & office Exhaust fans (entire power plant area including Coal yard, Boundary wall, security gate, raw water pump house, chimney, towers, offices). Plant area, building, structure & chimney lightening arrester checking and testing. All type of ladders and approach to work at heights/street lights to be arranged by O&M Operator.

AIR CONDITIONERS, WATER COOLERS AND PURIFIERS

Preventive, predictive, routine and Breakdown maintenance of HVAC System including package type, window type, split type and Centralized air conditioners, water coolers and purifiers, Cleaning, checking, repair and replacement of air filters/fans/gas charging/replacement of compressor/power and control Circuits/humidity/temperature /Earthing for plant and offices.

GENERATOR AND EXCITATION SYSTEM

Preventive, predictive, routine and Breakdown maintenance of Generator and Excitation system including troubleshooting, cleaning, checking, repair and

replacement of carbon brushes /holders/exciter/lubrication of bearings/ vibration /winding and bearing temperatures/testing/meggering/exciter connections/earthing. Cleaning, checking, repair and replacement of control fuses in the excitation and AVR panels/contactors/control transformers and exciter transformers /AVR mode hangeover/ testing of AVR interlocks/indications/ammeters/voltmeters/meggering/control circuits/earthing. RLA test of Generators.

VFDS

Checking, Cleaning, tightening of control & Power connections, replacement of components, control circuits checking, trouble shooting and condition monitoring.

LAB EQUIPMENTS, MAINTENANCE BOARDS AND DRAWINGS

Routine and breakdown maintenance of lab instruments, MCB's. sockets, heaters and ovens. All modification jobs are to be entered in to the master drawings and modified part drawing must be pasted on the respective panel, Calibration of measuring & testing equipments.

DIESEL GENERATORS

Preventive, predictive, routine and Breakdown maintenance of DG, Excitation, battery, battery charger, synchronizer, control circuit, power circuit & panels including troubleshooting, cleaning, checking, repair and replacement of faulty parts. Cleaning and changing of filters / lubrication of bearings / winding and bearing temperatures /testing/ meggering /exciter connections/earthing.

TESTING AND CALIBRATION

RLA testing of Generator, GT, UAT, SAT in Overhauling or in opportunities once in a year and as and when required. Oil BDV test, DGA test once in a year for >1MVA Transformers and as & when required. Calibration of energy meters as required by CSEB. Testing of Protection relays, CTs, PTs, LAs, CVTs, LT-HT breakers, Bus bars, Switchyard equipments. Calibration of testing and measuring equipments/instruments by authorized agencies. Condition Monitoring of all electrical equipments, HT & LT motors. IR, PI, Hi pot test, Signature analysis of HT motors. Hot Line test of LA for leakage current. Discharging-Charging cycle checking of batteries. Testing Certificate and annual testing of all lifting tools & tackles. Thermography of OH line, transformer core earthing, panel/contactor/breaker/lugs at power connection points.

SHIFTING/LOADING/UNLOADING

Shifting, Loading, Unloading of materials, spare parts from store to workplace, work place to store, central store to local store, local store to central store, inside the plant movement and to outside agency for repairing with arrangement of hydra and suitable vehicle.

ANNUAL MAINTENANCE CONTRACT

AMCs to be awarded to OEM/Expert agencies for equipments like AVR, VFD, UPS, Battery Charger,DCS and other critical equipments, where the criticality of equipment is more and it needs expertise. AMC awarded to agencies other than the OEM to be prior approved by the owner.

REPAIRING OF ELECTRONIC PARTS & CONTROLLERS

Repairing of electronic cards, transducers, meters, temperature controllers, ESP controllers, electrical testing & measuring instruments, detecting & replacement of faulty components.

LOCAL STORE

Maintaining the local store with the history of spare issued and used; proper tagging and health card/testing date to be fixed. Testing of spare parts before use. Maintaining the defective parts, damaged batteries, used grease. Monthly reconciliation status of spares, lubricants, motors, bearings, consumables to be provided to owner. Defective parts only be declared as scrap with written approval of owner. If the owner repairs any defective component/part/equipment declared as scrap by the contractor will be debited from Contractor's bill.

SAFETY/5S

Safety at workplace, Work permit system, proper check sheets, placing of danger board, men on work board, hazard identification & elimination, cleaning of workplace, proper tagging, LOTO, cleaning of panel rubber mats. 24V lamp with transformer while working in confined area.

**TECHNICAL CONDITIONS**

- Providing necessary manpower, extension board with cable & top, halogen, handlamp, tools and tackles for overhauling of transformers and generators and auxiliaries as and when required and when experts come from outside.
- All the supervisors should have 'C' license and skilled electricians should have either 'B' or 'C' license to carry out the maintenance work in the entire electrical system. Contractor should have either EA or ESA license to carry out any addition/modification/defect rectification works in the electrical system.
- The contractor shall arrange necessary tools and tackles like measuring instruments like Megger (HT & LT), Multimeter, Tong tester (AC and DC), Earth megger, timing testing kit, Contact resistance meter, timing testing kit, micro ohmmeter, secondary injection

kit, variac, phase sequence meter, hydrometer, Motor checker etc. for routing, preventive and breakdown maintenance.

- For regular maintenance work, emery roll, sand paper, commutator cleaner, electronic component cleaner, necessary Insulation tape (PVC/Para/Empire/Fibre-glass/Glass mica/Cotton), cotton waste, cotton cloth, Petrol, Kerosene, Diesel, CRC-226, Rustolene, CTC, lugs, soldering iron, de-soldering pump, test board, 24 V hand lamps with transformer and all cleaning elements etc., shall be in the contractor scope.
- The contractor should take care of the safety for employees and Machinery. For that the contractor should arrange the required earth rods, hand gloves (15 KV ), fuse Pullers, Torch light and insulated tools etc.,
- Standard bearing heater (coil type and oil immersed), Standard bearing inserting pipes (Not handmade), and all types of standard pullers for removal of bearings, couplings and pulleys are in contractor scope.
- Yearly Report (equipment wise)
- Monthly report to be submitted in a chronological order.
- CEIG compliance is to be given (for the regular defects)
- Immediate attention is to be paid for the breakdown defects, problems for all control & Power circuits and to be rectified in a reasonable time.
- All power and control wiring modifications, replacement of any part for indigenisation of spare, any type of temporary arrangements for any requirement is there in maintenance agency scope.
- Daily checks for all equipments should be done daily in a particular time and the same should be submitted to TSPL engineers daily.
- Filled logbook duly signed by the supervisor should be submitted to TSPL engineers daily. However the completed log book should be handed over to TSPL for future reference.
- All spares handling with tagging, maintaining the lab equipments and related areas, store rooms and overhauling areas neatly.
- Any requirement of the system to work in online has to be taken up online and the safety of men and material has to be taken care by the contractor.
- Maintaining of all records should be as per ISO standards. Tr. Oil BDV, Tr. Oil Acidity, Earth Resistance, Equipment List, HT motors IR, PI & Dielectric absorption factor, History of equipment, List of authorized persons , Check list for all equipment, PM Schedules month wise, yearly, CAPA, Overhauling report, Daily & Month-wise Spare Consumption report, Analysis of Break down (MTBF), Failure Analysis Report etc. All above are to be maintained in chronological order as a part of ISO. Filing of history cards in regular basis.

### *6.13.3 INSTRUMENTS AND CONTROLS*

**SCOPE OF WORK**

Maintenance of all field instruments, control panel, control system of the Main plant, BOP including raw water pump house mentioned areas shall be in contractor's scope.

Maintenance of all the Field Instrumentation , Control systems , Control Panel, PLC, DCS (excluding software and programming) Main and BOP plant including Raw water pump house and Water & Coal Analysis Lab Instruments Which includes Preventive/

Routine maintenance , Repair , Overhauling, Modifications, New Installations (For replacement & Improvement jobs), Routine/Non Routine Calibrations, Trouble Shooting , Dismantling, Fabrication, Mounting , Lubrication, Covering , Cleaning , Checking & Replacement , Addition / Deletion of Instrumentation process connections, Cable testing , removing / Laying (whenever required) with conduit /Tray and painting of Instruments (whenever required),.. Etc. And maintaining track / Record of all the activities as per ISO Standards.

1. Overhauling of all the Control and instrumentation equipment in the entire power plant, replacing the damaged items with the spares.
2. Small additions/deletions/modification works involved in the cable route, cable tray, impulse lines, instruments, panel cutouts etc. should be carried out by Contractor as and when required.
3. Spares like washers, small screws, bolts and nuts etc. will be in Contractor scope and should be replaced as and when required.
4. Calibration, dismantling, mounting, repair, overhauling, routine maintenance, preventive maintenance, cleaning, replacement and checking the operating condition while on site and in the laboratory for all the field instruments viz. – pressure indicators, pressure indicating switches, pressure switches, differential pressure indicators, differential pressure indicating switches, differential pressure switches, level switches, pressure transmitters, differential pressure transmitters, level transmitters, flow transmitters, level switches, temperature indicators, temperature indicating switches, temperature elements. RTDs', Thermocouples, limit switches, solenoid valves, on-line analyzers, analytical instruments etc.
5. Routine checking of control power supply, main power supply, connection tightness etc. for all the electrical actuators, impulse line tightness checking/leakage detection and arresting for all the pneumatic actuators and tightness associated with hydraulic lines.
6. Contractor has to arrange for temporary power supply from the point provided in plant by Owner for site calibration, maintenance, and repair works execution. Contractor shall provide all the hardware required for making these arrangements.
7. Contractor has to arrange for temporary instrument air supply line, from the point provided at site for calibration, maintenance, and repair works execution. Contractor shall provide all the hardware required for making these arrangements.
8. All maintenance/repair jobs in DCS and PLCs' will be in Contractor scope.
9. Contractor using the laboratory/laboratory equipment provided by Owner will carry out all calibration works in the laboratory or if possible in the field itself whichever is applicable. The routine/preventive maintenance in the laboratory such as charging/replacing batteries for electronic equipment, minor rectification/repair jobs, cleaning of laboratory will be in Contractor scope.
10. Contractor has to daily/periodically check/inspect the field instruments, panels, actuators, transmitters, impulse lines etc. In case of any damage/misalignment/mal-operation/abnormal conditions, will have to immediately rectify and inform the same to Owner Engineers.

11. All maintenance/repair/overhauling etc. for the pneumatic/motorized/hydraulic actuators.
12. Interlock; loop (starting from field end till the field termination assembly/panel). Continuity-checking, cable, impulse line-tracing, sequence of operation checking, trip setting are to be carried out by Contractor at the discretion/guidance/assistance of Owner Engineers.
13. Routine/daily cleaning/removal of oil stains, dust, rust from panels, actuators, junction boxes, field transmission assemblies, flame scanners, field instruments/mounting/supports, other equipment etc. will be in Contractor scope. Whenever possible mechanical means will be used.
14. Maintenance, minor repair works, cleaning of computers, printers, mouse etc. involved in plant automation.
15. Painting of damaged, dismantled, and rusted portions etc. in field instrumentation and panels.
16. Applying lubricant, cleaning filters, removing chokes in the impulse line, filters, plugging leaks etc.
17. Attending Trouble shooting and other emergency time/jobs.
18. Removing the indicators, recorders, transmitters, valves and other instruments, equipment, monitors of the entire power plant and transporting them to stores, laboratory and vice versa or outside the plant for servicing, repair and re-fixing them in their appropriate places.
19. Checking of cables and terminations, Laying and connecting of cables as and when required
20. Fabrication of items like canopies, junction boxes, Panel cutouts for installing any instruments, mounting brackets for any field mounted instruments, siphons for instruments, thermo wells for temperature gauges and impulse lines fabrications.
21. The checking instruments like multimeters, meggers, clamp meter, loop calibrator, pneumatic receiver gauges, soldering station, pneumatic/instrument line tools like cutter bender etc. shall be contractor's scope.
22. All consumables including brass fittings, non-metallic & metallic tubes shall be under contractor's scope.
23. The removing, replacement, shifting of field and panel instruments and motorized valves, control valves as per advice of Owner engineers shall be in contractor's scope.
24. Maintenance of lab instruments, provided by Owner & of its own.
25. Calibration of Master calibrating instrument by recognized and authorized external agency.
26. Passivation and preservation of removed instrument.
27. OEM support for specialized activities on owner's instruction.
28. Tools as per owner's instruction.
29. Tagging of instruments and cables.
30. Instrument network maintenance
31. Communication tools such as laptop, cables will be contractors scope however relevant software will be owners scope
32. Requirements related to boiler inspector and environmental auditors to be fulfilled by contractors
33. Material movement from store to site and site to store.
34. Managing of local store for critical spares.

35. Site cleaning after maintenance activity.

Contractor has to depute experts in various areas such as:-

PLC/DCS/ANALYZERS/CEMS/Hydraulics/Pneumatics/ Laboratory (chemical and instrument)

Contractor has to keep minimum manpower (for normal maintenance or for overhauling/shutdown) as decided by owner

Contractor has to inform owner about their spare requirements well in advance.

Contractor has to develop SMPs and has to take approval of owner.

Laying / Removal of Power and control cables as and when any modification, safety, maintenance requirement jobs are being done.

### *6.13.4 SAFETY & HYGIENE*

It is understood that the contractor will ensure the supply and usage of all the safety and personnel protective equipment (PPE) prescribed under the factory act and rules/ contractors safety manual/Owners Safety manual, for the specific job for which they are engaged. In case of the violation of the standard guidelines on safety, Owner can impose penalty and /or Owner can take disciplinary action against the concerned.

The contractor shall ensure first grade house-keeping and hygiene of entire TSPL area, in case poorhouse keeping is noticed by the Owner, Owner can engage their own agency for house-keeping at the cost of O&M Operator/impose penalty on contractors. Refer Annexure F

## 6.14 ANNUAL OPERATING PLAN

6.14.1 On or prior to 30 days of each Contract Year, the Operator shall prepare and submit to the Owner a proposed annual operating and maintenance plan ("Annual Operating Plan") for the following Contract Year (or portion thereof), detailed on a Monthly basis, and shall set forth, in form and substance reasonably acceptable to the Owner:

a. expected operations, repairs, capital improvements, teardowns and major overhauls;
b. routine maintenance and overhaul schedules;
c. data regarding other work proposed to be undertaken by the Operator; and
d. Projected Coal consumption and Coal stockpile levels

6.14.2 In preparing and providing the Annual Operating Plan, the Operator shall apply the standards of performance provided in Section 6.2 and make such plans consistent with the availability requirements in this Agreement.

6.14.3 Upon receipt of comments from the Owner on the Annual Operating Plan, the Operator shall incorporate the Owner's comments, discuss and resolve any differences, and on or prior to the date that is fifteen (15) Business Days following the receipt of Owner's comments, prepare and submit to the Owner a final Annual Operating Plan.

6.14.4 The Owner and the Operator shall meet, if necessary, promptly after all or any aspect of an Annual Operating Plan shall have been disapproved, in order to agree upon a final Annual Operating Plan.

6.14.5 Any actions proposed under the Annual Operating Plan shall be consistent with the O&M Manuals and the Operator's obligations set forth in an Agreement. The Operator shall notify the Owner as soon as reasonably possible of any significant deviations or discrepancies from the Plant Plantations contained in the Annual Operating Plan. The Annual Operating plan shall be reviewed as frequently as proposed by the Owner from time to time and in no case more than 2 (two) months.

## 6.15 OBLIGATIONS OF THE OWNER

6.15.1 The Owner shall furnish to the Operator, the following:- :

a. procure, for each Unit, an initial inventory of Spare Parts in accordance with the initial Spare Parts lists commented upon under Section 6.8.3 on or before the Commercial Operation Date of each Unit;
b. provide to the Operator all technical, operational and other information in the

Owner's possession or under its control, including copies of any operation and maintenance manuals, drawings and design materials;

c. provide the Operator with at least [two (2)] copies of any Manufacturers" Manuals supplied by the EPC Contractor prior to the then-anticipated Commercial Operation Date of Unit 2 (first unit);
d. provide and obtain the Permits required to be obtained and maintained by the Owner;
e. pay the Operator the agreed amounts for Services properly performed;
f. so far as it is able pursuant to other Plant Agreements, provide the
g. Operator with access to the Plant as is necessary to perform the Services at all reasonable times during the Operating Period, subject to security and safety requirements;
h. comply with its insurance obligations under section 9;
i. notify the Operator within twenty-four (24) hours of his becoming aware
j. of any events within the knowledge of the "Owners representative" that will have an adverse effect on the performance of the Services;
k. provide Owner Staff in accordance with the Staffing Plan;
l. give to the Operator reasonable assistance when requested in determining
m. requirements imposed by Competent Authorities;
n. enter into the Coal Supply Agreement for the supply of Coal and the
o. Secondary Fuel Supply and Transportation Agreement for the supply of Secondary Fuel. Without prejudice to Section 3.2/Annexure-B, the Owner shall give reasonable support to the Operator in management of the Coal Supply and the Secondary Fuel Supply.
p. make payments as required under the EPC Contracts and make the Units available to the Operator as provided under the EPC Contracts. The Owner shall at its own cost and expense pay for any upgrades and additions to the Plant which the Owner determines to be necessary or advisable; and
q. provide to the Operator copies of the Plant Agreements and any additions, amendments or replacements thereto.

## 6.16 O&M OPERATOR'S REPRESENTATIVE

The Operator shall appoint his representative who shall be authorized and empowered, to act for and on behalf of the O&M Operator in all matters concerning the Operator's obligations. In addition, the Operator shall appoint a Deputy to the primary representative to act for and on behalf of the Operator should the primary representative be unavailable or unreachable.

In all such matters, the Operator shall be bound by the communications, directions, requests and decisions issued in writing by the O&M Operator's representatives.

## 6.17 O&M OPERATOR'S CLEARANCES

The Operator shall, prior to the "Authorization to Proceed" and during the Term,

obtain all clearances necessary for the Operator to do business in India and to be authorized to provide the Services as an O&M Operator including clearances required for any of its employees, contractors or subcontractors, who are not citizens of India, to work, reside or otherwise perform Services in India.

The O&M Operator shall during the Term initiate and maintain procedures necessary to comply with all directives, including those related to prevention of injury to persons or damage to property at and in connection with the Facility, and to fulfill its other obligations under this Section relating to Clearances.

The O&M Operator shall review all Directives containing or establishing compliance or other requirements in connection with the operation and maintenance of the Facility or applicable to the O&M Operator in connection with its obligations for the O&M Services, and shall during the Term assist the Owner in securing and complying with all Clearances as set forth in Annexure H: Clearances (including any renewals or replacements of the same), necessary for the Facility operation and maintenance, including but not limited to those relating to turbine and boiler operation, water and sewer use and treatment and disposal of chemicals and other waste, including Hazardous Materials.

All such Clearances shall be in the name of Owner except for any individual Clearances required to be in the O&M Operator's name. With respect to replacements and renewals of Clearances obtained by Owner to the extent that it has actual knowledge of the existence and the terms of the original Clearances, the O&M Operator shall:

1. Provide reasonable notice to Owner in writing of the need to replace, renew or obtain such Clearances;
2. Perform any information monitoring and testing required to replace, renew, obtain or comply with such Clearances;
3. Provide Owner with any data, information and results of the monitoring and testing mentioned above in paragraph 2;
4. Prepare documents reasonably requested by Owner in connection with replacing, renewing or obtaining or obtaining such Clearances.

## 6.18 SCOPE OF SERVICES

### 6.18.1 General Scope of services

The O&M Operator shall be responsible for providing the services for the period prior to Authorization to Proceed, Mobilization Period, the Operating period and the De-Mobilization Period as described in section 6.3, 6.4 & 6.7.

### 6.18.2 Additional Services

There will be occasions when the O&M Operator will be required to perform work, which falls outside the scope of supply of the original O&M Contract.

Additional Services means those additional services and responsibilities of the Operator, other than the Services specifically described in the O&M Agreement. Services which are reasonably incidental and required to be performed in accordance with Prudent Utility Practices, shall not be additional service; The Operator must justify that he is qualified to perform such additional services and, the Operator shall only be reimbursed for costs and expenses actually incurred or paid by the Operator in connection with the Operator providing such Additional Services.

6.18.3 Changes to the Power Station specifications, Upgrades, Modifications

Any proposal for implementing improvement, modifications, upgrading or addition to the Facility's original design shall be previously proposed by the O&M Operator to the Owner. The procedure will be more fully described in the O&M Agreement.

6.18.4 Standards of Conduct and Compliance with Plant Documents and Applicable Law

The O&M Operator shall perform all of the Services including the Additional services in accordance with the following documents, in order of priority.

1. Applicable Law and directives;
2. Clearances;
3. The Facility Agreements;
4. Utility Good Practices;
5. Procedures established by the O&M Operator with the Owner to deal
6. with an Emergency Event;
7. The terms and conditions of this Agreement.
8. The O&M Manuals;
9. All applicable requirements under insurance policies obtained by Owner or the O&M Operator for the Facility;
10. Written Operating Procedures and Dispatch operating rules and performance standards and procedures of PSPCL and the PSPCL Grid System;
11. The applicable Annual Operating Plan;
12. Applicable Contractor, subcontractor and vendor warranties

6.18.5 O&M Operator's staff

The personnel provided by the O&M Operator in the performance of the Services shall be employees of the O&M Operator, of its Affiliates, or of qualified subcontractors (approved by Owner).

The O&M Operator Staff necessary to operate, maintain and repair the Facility including any supervisory personnel shall be approved by the Owner before they are hired by the O&M Operator. The O&M Operator shall compensate the O&M Operator staff hereunder and shall perform all functions required to facilitate the payment of the O&M Operator Staff salaries and human resources management. All such persons shall perform their duties at the direction and under the supervision and responsibility of the O&M Operator, and shall be deemed agents of the O&M Operator. The O&M Contactor shall be responsible for the acts and omissions of such persons acting within the scope and conduct of their respective duties.

All personnel engaged in the performance of the Services shall be qualified to perform and experienced in the duties to which they are assigned (or be trained in the same) and shall meet the requirements for Facility personnel under the O&M Manuals and in accordance with Utility Good Practices. The working hours, rates of compensation and all other matters relating to the employment of personnel performing the services shall be consistent with the relevant labour agreements entered into by the O&M Operator with respect to such employees.

The O&M Operator shall be solely responsible for the employment policies that specify requirements for the O&M Operator Staff. Such policies are to be consistent with any labour agreement entered into by the O&M Operators and conform to Labour Laws in force.

The O&M Operator shall observe directives relating to minimum age for employment acceptable conditions of work with respect to minimum wages, hours of work, and occupational health and safety and all other Statutory Norms.

The O&M Operator shall be solely responsible for obtaining in a timely fashion any required immigration Clearances and visas for the O&M Operator Staff.

Owner reserves the right to reject any staff of O&M Operator, based on the performance, character or behavior of the staff.

## PERSONNEL COMPETENCY

The O&M Operator shall demonstrate to Owner that the personnel provided under the O&M Operator is properly trained, competent to perform the work in charge, and is cognizant of site environmental, health and safety procedures.

## TRAINING

Prior to six months from de-mobilization the O&M Operator will be responsible for providing adequate training to the Owner’s engineers in the best practices for operating and maintaining power plants.

**TECHNICAL SUPPORT AVAILABLE NEARBY THE O&M OPERATOR**

The O&M Operator shall ensure experienced technical support during the period of the O&M Contract in order to be able to face any situation within its scope of activities. The O&M Operator shall stipulate the level of technical support available during the period of the O&M Contract and describe how this technical support will be provided.

## 6.19 CO-OPERATION AND COMPLIANCE

The O&M Operator agrees to co-operate with Owner in the negotiation and, upon the O&M Operator's approval (which shall not be unreasonably withheld), execution of any reasonable amendment or addition to this Agreement required by the Owner or any other Facility Agreement, provided that it does not result in a material adverse change in the O&M Operator's rights or obligations hereunder and that equitable adjustment is made to the Contract Amount, the Annual Operating Plan and such other provisions as are appropriate.

The O&M Operator shall permit Owner or his representative to perform certain activities (including concurring in certain actions taken by Owner and review of phase-in plans in respect of the Facility, the O&M Manuals, Staffing Plans, subcontracts subject to Owner's consent, and the Annual Operating Plan) as may be required from time to time under the Facility Agreements. The O&M Contractor acknowledges and agrees that Owner may, but shall not be obligated to, engage Owner's Engineer to advise Owner in connection with the subject matter of this Agreement and to monitor and inspect the Services and the operation, maintenance and repair of the Facility, among other duties which may be assigned by Owner. Without limiting the foregoing, the O&M Operator acknowledges and agrees that Owner's Engineer shall be entitled at Owner's direction to perform such monitoring, inspections and other acts in relation to the Services and the O&M Agreement as Owner is or may be entitled to perform pursuant to the O&M Agreement.

## 6.20 MONITORING OF THE FACILITY BY THE OWNER, ACCESS TO FACILITY

### 6.20.1 Facility Metering and Testing

Owner shall have the right to request, when it deems necessary the performance of a Dependable Capacity Test in accordance with the applicable provisions in the O&M Agreement. The test shall consist of the Declared Available Capacity during a period of 24 (twenty four) hours or such longer period as may be deemed necessary. Additionally, the Owner shall have the right to request a test of any of the Contracted Operating Characteristics, when it deems necessary.

The O&M Operator shall (i) permit Owner, to witness the tests on Declared Available Capacity or Heat Rate Tests of the Facility, or any calibration tests of

the Invoice Meters, and (ii) permit Owner to witness any other tests of the Facility or any component thereof, and the monthly reading of the Invoice meters conducted by the O&M Operator in accordance with any of the Facility Agreements.

### 6.20.2 Access to Facility to Owner and Owners Engineer

Owner's Engineer and their respective agents and representatives shall have access at all times with relevant safety to the Facility, all operations relating to the Facility and any documents, materials and records and accounts relating to such operations for purposes of inspection and review; provided, however, that Owner shall use reasonable efforts to provide such prior notice to the O&M Operator as may be consistent with the purpose of such inspection or review. The O&M Contractor shall also provide such access to such other persons, as Owner shall reasonably request. The continuous access to central monitoring and diagnostic centre of the owner shall be ensured

### 6.20.3 Co-operation

During any such inspection or review of the Facility, Owner. Owner's Engineer, and their respective agents and representative shall comply with all of the O&M Contractor's safety and security procedures, including the rules set forth in the O&M Manuals concerning visitors to the Facility and Owner, and their respective agents and representative shall conduct such inspection and reviews in such a manner as not to interfere unreasonably with the O&M Operator's activities.

The O&M Operator also shall co-operate with Owner in allowing other visitor's access to and tours of the Facility under conditions mutually agreeable to the parties. In the event that the O&M Operator provides access to the Facility to any Person other than as required or permitted by this Section, the O&M Operator shall notify Owner of the same.

## 6.21 LIMITATION OF AUTHORITY

Unless previously approved in writing by Owner, the O&M Operator shall not:

1. Dispose of Assets by selling leasing, pledge, mortgage, encumber, convey, creation of any Lien on or making any license, exchange or other transfer or disposition of any property or assets funded as operating costs, Contract on behalf of the Owner unless approved in the relevant Annual Operating Plan, make, enter into, amend, terminate, waive, modify or supplement any contract or agreement (including any labour or collective bargaining agreement) on behalf of or in the name of or which creates any obligation on the part of Owner: This clause do not apply to the ability of the O&M Operator to contract on behalf of ititself for any activity under its responsibility.

2. Settle, compromise, assign, pledge, transfer, release or consent to the compromise, assignment, pledge, transfer or release of any claim, action, suit, debt, demand or judgement against or due by the Owner, or submit any such claim, dispute or stipulate in respect thereof to a judgment, or consent to the same;
3. Take any action that would (i) invalidate any material warranty that runs to the Owner under the Contracts, (ii) release Contractors from their obligations under the Contracts, (iii) give rise to any claim by Contractors against Owner not available to Contractors under the Contracts, or (iiii) affirmatively release any Liens created by the Owner in the Facility Agreements.

## 7. PRICE AND PAYMENTS TO THE O&M OPERATOR

### 7.1 GENERAL FRAMEWORK

The Bidder shall propose a structure of remuneration for services with a part for current operation and maintenance activities and a part for major maintenance activities.

### 7.2 OPERATING COSTS DEFINED

The O&M Operator shall pay operating costs for the Facility ("Operating Costs"), which are those costs and expenses incurred or paid by the O&M Operator in conformity with the Annual Operating Plan or otherwise in connection with the O&M Operator's performance of the Services.

Such Operating Costs Include:

1. Costs of salaries, wages and benefits for the O&M Operator Staff engaged in the operation, maintenance and repair of the Facility including costs of incentives for supervisory personnel:
2. Reasonable out-of-pocket costs paid or reimbursed for travel and subsistence of personnel engaged in the performance of the services:
3. Costs of evaluation, selection, employment, relocation and training of the O&M Operator Staff.
4. Costs and expenses of equipment, uniforms, chemicals, lubricants, and other consumable materials, supplies Spare Parts, tools, special tools used, consumed or stocked in inventory in the performance of the services replacement costs and expenses of computers, office equipment laboratory and plant equipment purchased or leased to be installed at the Facility other than those equipment that are placed under Owner's cost.
5. Telephone costs for calls and fax related to performance of the Services:
6. All costs and expenses associated with Technical support consultants, subcontracts and other outside services incurred.
7. Costs to evaluate Major Equipment Failures to the extent such Major Equipment Failures require the hiring of outside consultants for evaluation.
8. all costs and expenses associated with services for site premises security and maintaining.
9. all costs and expenses associated with records management, including but not limited to preparation of materials, equipment, reproduction and storage expenses;
10. costs of permitted waste transportation and disposal services transportation services and security services;
11. cost of providing insurance which are required to be provided by the O&M Operator under an O&M Agreement and which are to be paid by the O&M Operator's;
12. stamp duties on the O&M Agreement and subcontracts entered into by the O&M Operator and costs of applying for, obtaining and maintaining clearances obtained by the O&M Operator at its cost and expense;
13. all national, state and local taxes imposed on the Contract amount including the indirect taxes and duties on labour and services;

14. accounting and legal expenses and other general and administrative expenses incurred;
15. cost of administration of locally incorporated affiliates including compliance with business registration and licenses, filing and payment of taxes and accounting with respect to the expenses and income of the Owner.
16. cost of replacement or repair which is attributable to negligence of O&M Operator.

## 7.3 CONTRACT AMOUNT PAYMENT MODALITIES

### 7.3.1 General

The annual contract amount shall be paid on monthly basis on a proportional basis within thirty (30) business days after the submission of the invoice supported by relevant documents (certified by Owner)

90% payment of Monthly Running Bill after TSPL EIC certification shall be paid in 30 days from the date of bill submission along with supporting documents and remaining 10% payment shall be paid after adjustment of incentives/penalties and/or scorecard review on quarterly basis.

### 7.3.2 Miscellaneous invoices

Any miscellaneous amounts owing from one Party to the other under this Agreement for which a payment schedule has not been set forth shall be invoiced in writing and accompanied by reasonable substantiation to the party from which such amounts are owing.

## 7.4 LIQUIDATED DAMAGES/LATE MOBILIZATION

7.4.1 For Late mobilization- 1.0% per week subject to maximum of 10% of annual contract value.

7.4.2 For Performance parameters

Liquidated damages as per section 8

It is further clarified that the Liquidated Damages on account of delay in mobilization and on account of non-fulfillment of Performance Parameters are mutually exclusive and therefore, shall be applied independently. Payment or deduction of Liquidated Damages shall in no way relieve you from discharging your obligation under this Contract.

## 7.5 FINES AND PENALTIES

### 7.5.1 Environmental Penalties

Owner shall ensure that the unit shall be capable at the take-over date

of being operated in complete compliance with all applicable existing environmental laws. The O&M Operator shall operate the facility so as to maintain such level of compliance with all of the said environmental laws, as well as the technical Plant limits, the equipment manufacturers prescribed technical operating limits specified in the contracts and the environmental clearance conditions [as defined in the technical specification of the contracts].

7.5.2 Indemnity

The O&M Contractor is responsible for compliance with \various regulations and shall keep Owner indemnified for all the claims arising out of the activities under this O&M contract.

## 8.0 PERFORMANCE GUARANTEES

The Bidders are required to give the following Guarantees:

### 8.1. DECLARED CAPACITY

8.6.1 The O&M Contractor shall guarantee Declared Capacity of 90% (including Deemed Capacity) for Power Station during each Financial Year.

8.6.2 The Declared Capacity for the Financial Year shall be calculated as follows:

$$\text{Declared Capacity} = \frac{\text{Net Capacity Declared + Deemed Capacity}}{\text{Period Hours}}$$

Where:

(a) "Net Capacity Declared" is the sum of net capacity of the Power Station (expressed in MWHr at the Interconnection Point) as declared by the O&M Contractor in accordance with the Grid Code and dispatching procedures as per the Availability Based Tariff & as per PPA;

(b) "Deemed Capacity" is the sum of net Deemed Capacity for Power Station; as defined below;

(c) "Period Hours" means the number of hours in the relevant Financial Year, i.e. 24 multiplied by the number of days in the relevant Financial Year.

**Deemed Capacity** – The Power Station thereof shall be eligible for deemed Capacity when it operates below the Rated Capacity as agreed by the Competent Authority of TSPL (in writing) due to the following reasons:

i. Reasons attributable to the grid disturbance/Power evacuation,
ii. non-availability of coal or / and water at source;
iii. Forced Majeure Conditions/Event;
iv. The instructions or Directives issued by Owner or any Competent Authority;
v. Non-availability of Spares due to the reasons non-attributable to O&M Contractor.

O&M Operator to note that Deemed Capacity shall be considered only for Liquidated Damage calculations.

**Liquidated Damages**

(a) The O&M Contractor shall pay Liquidated Damages for failure to achieve the Guaranteed Declared capacity. For every one percent (1%) shortfall from the Guaranteed Declared capacity till 80% Declared Capacity in a given Financial Year, the Liquidated Damages payable shall be point five percent (0.5%) of the Yearly O&M Fee and for every one percent (1%) shortfall from the 80% Declared capacity till 75% Declared Capacity in a given Financial Year, the Liquidated Damages payable shall be one percent (1%) of the Yearly O&M Fee.

(b) Throughout the Term, a monthly performance report of the Declared Capacity shall be submitted out by the O&M Contractor, subject to endorsement by the Owner in the first week of each month following the relevant month.
(c) The aggregate Liquidated Damages payable for shortfall in the Declared Capacity from the Guaranteed Declared Capacity / Guaranteed Performance Parameter shall be subject to the Liquidated Damages Cap.
(d) The reconciliation of LD for the purpose payment will be computed on monthly cumulative declared capacity.

**Bonus**

(a) In case of excellent performance towards improvements in the Declared capacity by the O&M Contractor, the Owner shall pay the Bonus on yearly basis as follows:
(b) For every one percent (1%) improvement in the Guaranteed Declared Capacity in a given Financial Year, the Bonus payable shall be point five percent (0.5%) of the Yearly O&M Fee.
(c) The reconciliation of Bonus will be computed at the end of Financial year.
(d) Deemed Declared capacity shall not be considered while calculation of yearly Bonus.

## 8.2. STATION HEAT RATE

8.2.1 The O&M Operator guarantees and undertakes to the Owner that the Station Heat Rate ("**SHR**") calculated as fuel flow multiplied by fuel heating value divided by the power output measured at the Plant's generator terminals shall not exceed the value as stated in Annexure-E, or the average Station Heat Rate demonstrated by the EPC contractor during the Plant Guarantee Test, whatever is higher, (i.e. if demonstration value is more than the Guaranteed value, demonstration SHR shall be considered and if the demonstrated value is less than Guaranteed SHR then demonstrated SHR shall be considered).

8.2.2 6.2.2 For purposes of this O&M Agreement, the SHR shall be measured using Plant instrumentation only.

8.2.3 6.2.3 The SHR Guaranteed Value shall be modified to the following extent in the following circumstances:

(a) in accordance with variation in the Gross Calorific Value of the coal supplied to the Plant on as-received-basis ("**GCV-ARB**"): The GCV-ARB shall be determined on the basis of a sampling and GCV-ARB analysis for all in-coming coal carried out by a Third party representative of the Owner which shall be witnessed by a representative of the O&M Operator & PSPCL as per applicable ASTM Standards. The GCV- ARB calculation carried out by Third Party on this basis shall be final and binding on the Parties as the SHR Guaranteed Value.
(b) In the event O&M Operator operate the Plant at variance from the design conditions for the relevant period, the SHR Guaranteed Value shall be modified by mutual agreement, in writing, by the Parties as per OEM recommendation & prudent practices

## 8.3. SHR LIQUIDATED DAMAGES

8.3.1 If the SHR is higher than the SHR Guaranteed Value, the O&M Operator shall pay Liquidated Damages as shown in the table below:

**For Plant Operating Period:**

| Sl. No. | SHR Slab | | Liquidated Damages for each 1 kcal/kwhr increase in SHR within SHR Slab (as % of Monthly O&M Fee) | Cumulative Liquidated Damages (as % of Monthly O&M Fee) |
|---|---|---|---|---|
| | From (kcal/kwhr) | To (kcal/kwhr) | | |
| 1 | 2223 | 2248 | 0.030% | .030% x 25 = 0.750% |
| 2 | 2248 | 2273 | 0.045% | .750% + (.045% x 25) = 1.875% |
| 3 | 2273 | 2298 | 0.060% | 1.875% + (0.060% x 25) = 3.375% |
| 4 | Above 2298 | | 0.075% | 3.375% + (0.075% x 25) = 5.250% |

8.3.2 The aggregate Liquidated Damages payable for failure to achieve the SHR Guaranteed Value shall be subject to the Per Parameter Liquidated Damages Cap.

8.3.3 Where the SHR as determined in the performance guarantee tests or as modified under Section 6.2.3 is higher than 2223 kcal/kwhr, the SHR Slab in each of the tables above shall be modified so that the first slab starts from the relevant Higher Guaranteed SHR and the upper end of each slab shall be adjusted so as to maintain a difference of 25 kcal/kwhr in each SHR Slab.

## 8.4. SHR BONUS

8.4.1 The O&M Operator shall be entitled to a bonus payment in accordance with the table below if the SHR for the Plant is less than 2198 kcal/kwhr:

**For Plant Operating Period:**

| Sl. No. | SHR Slab | | Bonus for each 1 kcal/kwhr decrease in SHR within SHR Slab (as % of Monthly O&M Fee) | Cumulative Bonus (as % of Monthly O&M Fee) |
|---|---|---|---|---|
| | From (kcal/kwhr) | To (kcal/kwhr) | | |

| | | | | |
|---|---|---|---|---|
| 1 | 2198 | 2173 | 0.030% | 0.750% |
| 2 | 2173 | 2148 | 0.045% | 0.750% + (0.045% x 25) = 1.875% |
| 3 | 2148 | 2123 | 0.060% | 1.875% + (0.060% X 25) = 3.375% |
| 4 | Below 2123 | | 0.075% | 3.375% + (0.075% X 25) = 5.250% |

8.4.2 Where the SHR established during the PG test, is higher than 2223 kcal/kwhr, the SHR Slab in each of the tables above shall be modified so that the first slab starts from the relevant Higher Guaranteed SHR and the upper end of each slab shall be adjusted so as to maintain a difference of 25 kcal/kwhr in each SHR Slab.

## 8.5. AUXILIARY POWER CONSUMPTION (APC)

8.5.1 The O&M Operator guarantees and undertakes to the Owner that Auxiliary Power Consumption ("APC") shall be as stated in Annexure E ("**Guaranteed APC**") or the APC demonstrated during the Plant Guarantee Test by the EPC contractor (whatever is higher).

### 8.5.2 Liquidated Damages for Auxiliary Power Consumption

The O&M Operator shall be liable to pay Liquidated Damages as calculated below if the APC of the Plant in a given month is higher than the Guaranteed APC:

| **S. No.** | **APC Slab** | | **Monthly Liquidated Damages Rate per .001 increase in APC (as a % of the Monthly O&M Fee)** | **Cumulative Liquidated Damages Rate (as a % of the Monthly O&M Fee)** |
|---|---|---|---|---|
| | **From** | **To** | | |
| 1. | .075 | .077 | 0.15% | 0.30% |
| 2. | .077 | .10 | 0.20% | 4.90% |

The aggregate Liquidated Damages payable for shortfall in the APC from the Guaranteed APC shall be subject the Per Parameter Liquidated Damage Cap.

### 8.5.3 Bonus Related to Auxiliary Power Consumption

If the Auxiliary Power Consumption in a month is less than .075, the O&M Operator shall be entitled to the following monthly bonus: For each .001 decrease in the APC from the Guaranteed APC, the bonus shall be 0.03% of the Monthly O&M Fee.

Where the PG Test Value for the APC is higher than .075 ("**Higher Guaranteed APC**"), the APC Slab in each of the tables above shall be modified so that the first

slab starts from the relevant Higher Guaranteed APC and the upper end of each slab shall be adjusted so as to maintain the same difference between the lower and upper levels of each APC Slab.

## 8.6. SECONDARY FUEL CONSUMPTION (SFC) – OIL (HFO/LDO/HSD) CONSUMPTION

8.7.1 The O&M Contractor shall guarantee that the Secondary Fuel Consumption ("SFC") for the Plant (due to the reasons solely attributable to O&M Contractor) shall be 0.5 ml/kwh ("Guaranteed SFC").

8.7.2 **Liquidated Damages**

The O&M Contractor shall be liable to pay as Liquidated Damages @ 50% of the cost of extra oil consumed in the event the SFC is higher than the Guaranteed SFC in any given month due to the default of O&M Contractor. Provided that the aggregate Liquidated Damages payable on this account shall be subject to the Liquidated Damages Cap.

8.7.3 **Bonus**

The O&M Contractor shall be paid Bonus @ 50% of the cost of oil saved in the event the SFC is lower than the Guaranteed SFC in any given month. Provided that the aggregate Bonus payable on this account shall be subject to the Bonus Cap.

## 8.7. COAL UNLOADING RATE

Subject to the successful demonstration jointly in this regard with the Owner, the O&M Contractor shall guarantee unloading of BOXN rakes within 7 hours or as permitted by Indian Railways to TSPL ("Guaranteed Coal Unloading Rate"). Any demurrages levied by the railways due to delays in unloading of coal for reasons attributable to O&M Contractor will be borne by the O&M Contractor.

## 8.8. MISCELLANEOUS PARAMETERS:

The standards of performance of the plant as described hereunder are referred to collectively as "miscellaneous parameters".

## 8.9. SAFETY LEVEL LIQUIDATED DAMAGES

8.9.1 The O&M Operator guarantees and undertakes that, with respect to the Plant O&M Staff, there shall be no lost time due to injury ("**LTI**") ("**Guaranteed Safety Level**"), reportable under prevailing labour and factories laws and regulations, caused due to accidents at the Plant. For every accident at the Plant resulting in the death of any O&M Plant Staff, the O&M Operator shall pay to the Owner as Liquidated Damages on account of LTI for every accident at the Plant resulting in:

(a) the death of any O&M Plant Staff,Rs.2,00,000 (Rupees Two Lakh); and

(b) non-fatal injury to any Plant O&M Staff, Rs 20,000 (Rupees Twenty Thousand).

8.9.2 Notwithstanding any Liquidated Damages paid by the O&M Operator to Owner, the O&M Operator shall be solely responsible to compensate all workmen and other victims (or their closest surviving relative as the case may be) for any accident at the Plant during the Term as per the provisions of applicable law. Furthermore the O&M Operator shall indemnify, defend and hold harmless the Owner from any liability in this regard.

## 8.10. SAFETY LEVEL BONUS

For each month of the Term that the Guaranteed Safety Level is achieved, O&M Operator shall be entitled to a bonus of Rs. 50,000/ per month.

## 8.11. HOUSEKEEPING STANDARDS

Within one hundred twenty (120) days from the Effective Date of this O&M Agreement, the Parties shall agree Liquidated Damages and bonus in relation to housekeeping by the O&M Operator based on rankings in accordance with audits done by the Owner. The audits will be based on either a scorecard or a 5S system or a system along universally acceptable lines. The O&M Operator shall, based on its experience operating plants around the globe, develop the procedure for these standards and get the required approvals from the Owner within the time period indicated above.

Additionally Bidders are also required to ensure that the following parameters are maintained:

1. Emission norms with reference to SPM, SOX and NOX.
2. Water Chemistry
3. Specific water consumption
4. Fugitive Coal/dust Emissions from Plant

Deviations from the design norms, in case of points 2,3,4, will have to be corrected, within reasonable time, by the O&M Operator at no cost to the Owner.

## 9.0 INSURANCE

### 9.1 OWNER'S INSURANCE

Owner will take comprehensive plant and equipment insurance and O&M contractor will comply with all obligations under the insurance policy.

### 9.2 O&M OPERATOR'S INSURANCE

The O&M Operator shall obtain and maintain in effect during the term or cause to be maintained in effect during the term, the insurance coverage set forth below underwritten by insurers of sound financial standing acceptable to owner and the lenders and authorized to underwrite such risks in India. To the extent these insurance coverage are available through Indian insurance companies, preference shall be given to use these companies subject to cost considerations:

a. workers compensation and occupational illness insurance for all the O&M Contractor staff or such statutory requirements under the applicable law of the home countries for foreign workers;
b. employer's liability insurance with adequate limits per occurrence and in the aggregate;
c. comprehensive or commercial general liability insurance with bodily injury and property damage subject to deductibles; such insurance shall include, but not necessarily be limited to, contractual liability, property damage liability personal injury liability, liability for pollution (sudden and accidental) and, where applicable, watercraft protection;
d. Comprehensive automobile liability insurance with bodily injury and property damage combined covering vehicles owned, hired or non-owned; excess umbrella liability insurance

## 10 FACILITY CONDITION AT THE END OF TERM

Upon the expiration or earlier termination of O&M Agreement, the O&M Contractor shall return all equipment, tools, material, documents, records, logs etc. to the Owner. The conditions stipulated under Section 6.7 shall be applicable here also.

## 11 INDEPENDENT CONTRACTOR

The O&M Operator acknowledges that it is an independent Contractor. The Agreement does not create any partnership, joint venture or other joint relationship between the Owner and the O&M Operator. Neither O&M Operator nor its employees:-

1. are employees or agents of the Owner.
2. shall represent, by words or conduct that they are employees or agents of the Owner.
3. Shall bind, or attempt to bind, the Owner to any under-taking, commitment or obligation without express written permission of Owner.

## 12 GENERAL CONDITIONS OF CONTRACT

### 12.1 SECURITY DEPOSIT AND BANK GUARANTEES

The Security Deposit in the form of Bank Guarantee in TSPL‟s format amounting to 10% (ten percent) of the Contract Price shall be submitted within 15 days of effective date. The said bank Guarantee shall be valid for one year and renewed 1 month prior to the end of that year in case of continuing contract or at the instance of owner.

All Bank Guarantees furnished by the Contractor shall be unconditional, irrevocable and from a first class bank of repute acceptable to the Owner.

All the Bank Guarantees shall have a claim period of 6 (Six) months from the date of expiry and shall be extended at the instance of the Owner, if required. However in case reasons are not attributable to contractor extension will be considered with mutual agreement.

### 12.2 UNLOADING, HANDLING AND PRESERVATION

The Contractor shall be responsible for the receipt, unloading, handling and preservation of all Plant and Equipments during the currency of the contract

### 12.3 EXTRAORDINARY TRAFFIC

The Contractor shall take all such measures as may be reasonably necessary to ensure that its arrangements and those of its Sub-Contractors with respect to the transport of goods, material and labour to the Site do not interfere with local traffic in the vicinity of the Site and where such interference is unavoidable shall

make such special arrangements and obtain such permissions from the relevant Competent Authorities as may be reasonably required to minimize the effect of such interference.

## 12.4 LEGAL COMPLIANCE AND STATUTORY REQUIREMENTS

Compliance with Applicable Law

The Contractor shall in its performance of the Contract and carrying out the Works, ascertain and comply with the Applicable Laws.

The Contractor shall indemnify the Owner, the Owner's Affiliates and their respective directors, officers, employees and agents against losses, claims and liabilities, including any governmental penalties and sanctions payable to a Competent Authority, together with any legal expenses incurred in connection therewith, to the extent arising out of any failure of the Contractor, any Sub-Contractor or their respective agents or employees to comply in the performance of the Contract.

Divergences from Statutory Requirements

If the Contractor or the Owner finds any divergence between the Applicable Law and the Performance Guarantees or the Technical Specifications, it shall immediately give to the other Party written notice specifying the divergence. The Contractor shall promptly upon becoming aware of the same, inform the Owner in writing of its proposed amendment for removing the divergence, and with the Owner's consent the Contractor shall after mutual discussion complete the Works in accordance with the amendment.

Contractor to Obtain Clearance

The Contractor shall be responsible to obtain and maintain in effect all Applicable Clearances (except insofar as the same are the responsibility of the Owner mentioned elsewhere in this document) required in connection with execution of the Works and pay all fees required to be paid to any Competent Authorities.

## 12.5 SECRECY AND CONFIDENTIALITY

The Contractor shall treat the details of the Contract and any information made available in relation thereto as private and confidential and shall not publish or disclose the same or any particulars thereof without the previous written consent of the Owner.

## 12.6 FORCE MAJEURE

A 'Force Majeure' means any event or circumstance or combination of events and circumstances including those stated below that wholly or partly prevents or

unavoidably delays an Affected Party in the performance of its obligations under this Agreement, but only if and to the extent that such events or circumstances are not within the reasonable control, directly or indirectly, of the Affected Party and could not have been avoided if the Affected Party had taken reasonable care or complied with Prudent Utility Practices:

**i. Natural Force Majeure Events:**

act of God, including, but not limited to lightning, drought, fire and explosion (to the extent originating from a source external to the Site), earthquake, volcanic eruption, landslide, flood, cyclone, typhoon, tornado, or exceptionally adverse weather conditions which are in excess of the statistical measures for the last hundred (100) years,

**ii. Non-Natural Force Majeure Events:**

**Direct Non - Natural Force Majeure Events**

a. Nationalization or compulsory acquisition by any Indian Governmental Instrumentality of any material assets or rights of the Seller or the Seller's contractors; or

b. the unlawful, unreasonable or discriminatory revocation of, or refusal to renew, any Consent required by the Seller or any of the Seller's contractors to perform their obligations under the Project Documents or any unlawful, unreasonable or discriminatory refusal to grant any other consent required for the development/ operation of the Project. Provided that an appropriate court of law declares the revocation or refusal to be unlawful, unreasonable and discriminatory and strikes the same down.

c. any other unlawful, unreasonable or discriminatory action on the part of an Indian Government Instrumentality which is directed against the Project. Provided that an appropriate court of law declares the revocation or refusal to be unlawful, unreasonable and discriminatory and strikes the same down.

**Indirect Non - Natural Force Majeure Events**

a. any act of war (whether declared or undeclared), invasion, armed conflict or act of foreign enemy, blockade, embargo;, revolution, riot, insurrection, terrorist or military action; or

b. Radioactive contamination or ionizing radiation originating from a source in India or resulting from another Indirect Non Natural Force Majeure Event excluding circumstances where the source or cause of contamination or radiation is brought or has been brought into or near the site by the Affected Party or those employed or engaged by the Affected Party.

c. Industry wide strikes and labor disturbances having a nationwide impact in India.

## 12.7 VALIDITY AND WAIVERS

If any provision contained in this Agreement is or becomes ineffective or invalid or is held to be ineffective or invalid by a competent authority or court or tribunal having
final jurisdiction thereon, all other provisions of this Agreement shall remain in full force and effect and there shall be substituted for the said provision such valid and effective provisions as have an economic effect as similar as possible to said provision. The failure of the Parties to enforce at any time any of the provisions of this Agreement, or any rights in respect thereof, shall not in any way affect the validity of this Agreement or the obligations or responsibilities of the Parties there under. The exercise by one Party
of any of its rights hereunder shall not preclude or prejudice the other Party from exercising its rights under this Agreement.

## 12.8 ARBITRATION

The Parties hereto shall endeavour to settle all disputes and differences relating to and/or arising out of the Contract amicably.

In the event of the Parties failing to resolve any dispute amicably the same shall be referred to Arbitration in accordance with the Indian Arbitration and Conciliation Act 1996, as is prevalent in India. Each Party shall be entitled to nominate an Arbitrator and the two Arbitrators so nominated shall jointly nominate a third Arbitrator. The Arbitrators shall give a reasoned award.

The place of arbitration shall be Bhathinda, Punjab and the language of the arbitration shall be English.

The Parties further agree that any arbitration award shall be final and binding upon the Parties.

The Parties hereto agree that the Contractor shall be obliged to carry out its obligations under the Contract even in the event a dispute is referred to Arbitration. It is further clarified that the Owner shall be entitled to retain any sum or portion of Contract price, which has become due and payable, for any unfinished Works or any subject matter under arbitration.

## 12.9 TERMINATION AND SUSPENSION

Termination Due To Contractor's Default

If the Contractor:

a. shall have voluntarily commenced winding-up, bankruptcy, insolvency, reorganization, stay, moratorium or similar debtor-relief proceedings, or

shall have become insolvent or is unable to pay its debts as they become due, or admits in writing its inability to pay its debts or makes an assignment for the benefit of its creditors;

b. has insolvency, receivership, reorganization or bankruptcy proceedings brought against contractor and the petition commencing such proceedings is not controverted and the proceedings dismissed or effectively stayed within 30 (thirty) days of such commencement;

c. has abandoned the Contract;

d. despite previous warnings in writing from the Owner, has wrongfully refused or has materially failed or neglected at any time to execute the Contract or is failing to proceed with the Contract with due diligence or is neglecting to carry out its other obligations under the Contract in each case so as to affect materially and adversely the execution of the Contract;

e. fails to correct services after receiving, from the Owner, notice to the effect that the said portion of Services requires correction

f. offers or gives or agrees to give to any person in the Owner's service or to any other person on its behalf, any gift or consideration of any kind as an inducement or reward for doing or for bearing to do so or for having done or forborne to do any act in relation to obtaining or execution of this or any other Contract for the Owner;

g. shall enter into a contract with the Owner's employee in connection with which commission has been paid or agreed to be paid by it or to its knowledge, unless the particulars of any such commission and the terms of payment thereof have previously been disclosed, in writing, to the Owner;

h. has failed to deliver services in part or full then the Owner may, by notice to the Contractor and without prejudice to any other remedy under the Contract, terminate the Contract but without thereby releasing the Contractor from any of its obligations or liabilities which have accrued as at the date of termination of the Contract and without affecting the rights and powers conferred by the Contract on the Owner. Upon such termination the Owner may itself complete the Supplies or may employ any other Contractor to complete the job at the risk and cost of the Contractor.

Opportunity to remedy

The Owner's right to terminate the Contract following the occurrence of the events or circumstances, as described above, shall be subject to the Owner having first given the Contractor 30 (thirty) days prior notice of its intention to terminate

the Contract, during which period the Contractor shall have failed to remedy or to take all reasonable steps to commence the remedy of the default.

Termination without Contractor's Default

The Owner reserves the right to terminate the Contract at any time, without assigning any reason, by giving a notice of 3 (three) months. The Contractor shall stop the performance of the Contract from the date of termination and shall hand over all the drawings, documents and demobilize the site as mentioned in the document, including related rights, sanctions and approvals, to the Owner. The Owner shall pay to the Contractor the cost incurred by the Contractor till the date of termination, duly supported with documents, as compensation after adjusting payments already made till the termination. No consequential damages shall be payable by the Owner to the Contractor in the event of such termination.

Suspension

The Owner may suspend the work in whole or in part at any time by giving Contractor notice in writing to such effect stating the nature, the date and the anticipated duration of such suspension. On receiving the notice of suspension, the Contractor shall stop all such work, which the Owner has directed to be suspended with immediate effect. The Contractor shall continue to perform other work in terms of the Contract, which the Owner has not suspended. The Contractor shall resume the suspended work as expeditiously as possible after receipt of such withdrawal of suspension notice.

If such suspension continues for more than 180 (one hundred and eighty) days, at the end of the said period, the Contractor shall be, by a further 30 (thirty) days prior notice, entitled to terminate the Contract. In such case, the Contractor shall hand over all the drawings, documents and goods manufactured till date, including related rights, sanctions and approvals, to the Owner. The Owner shall pay to the Contractor the cost incurred by the Contractor till the date of termination, duly supported with documents, as compensation after adjusting payments already made till the termination.

## 12.10 LANGUAGE

All documents, instructions, catalogues, brochures, pamphlets, design data, operation and maintenance manuals, software programs, communications shall be in English language.

## 12.11 NOTICES

**Notices to Owner**

Any contractual notice, report, certificate or other communication to be given to the Owner under the Contract shall be served by sending the same by facsimile transmission / electronic mail/ (with a confirmation copy by couriers or by hand delivery only in case of major issues relating to the Contract, Viz. Notices of Tests, arbitration, making a claim, termination etc.) to, or by leaving the same at, the respective addresses as may be specified for that purpose in writing to the

Contractor.

**Notices to Contractor**

All certificates, notices or decisions, instructions and orders to be given by the Owner's Representative or the Owner under the Contract shall be served by sending the same by facsimile transmission / electronic mail (with a confirmation copy by couriers or by hand delivery only in case of major issues relating to the Contract, Viz. Notice of Tests, arbitration, claims, termination etc.) to, or by leaving the same at, the address nominated by the contractor

**Serving of Notices**

Any notice sent by facsimile transmission / electronic mail shall be deemed to have been served at the time of receipt, provided that a positive transmission report from the sender's machine will be conclusive evidence of receipt in the absence of evidence to the contrary.

**Other Communications**

All other communications pertaining to the Supplies not referred to in above Clauses shall be made between the Contractor and the Owner's Representative or other representatives nominated by the Contractor or the Owner's Representative from time to time in respect of such categories of communication and subject to such limits of authority as may be agreed as part of the Plant co-ordination procedures or as may be notified from time to time.

## 12.12 GOVERNING LAW & JURISDICTION

This Contract shall be construed in accordance with and governed by the laws of India and in the event of any litigation the courts in Punjab, India shall have exclusive jurisdiction.

# Declaration

I Mr/Ms. _____, the undersigned, a duly authorize Officer/ Representative of (Company/Consortium) do hereby declare and state the following:

1) This Request for Proposal - O&M document has been read in its entirety.
2) We have followed the instructions specified in this while preparing the proposal.
3) We assume full responsibility and liability in utilizing and adopting any of the information and assumptions provided in this document.
4) We rescind our right to raise any exceptions in future beyond those documented in our proposal to any and all of the terms and conditions stipulated in this document
5) Our offer shall remain valid for a period of ninety (90) days from the last date of submission of the offer i.e. _____

Signed: _____ Date :_____

Full Name: _____
Designation: _____

Company seal

ANNEXURE - A - TSPL PLANT INFORMATION

| TSPL PLANT INFORMATION | | |
|---|---|---|
| 1 | Owner | Talwandi Sabo Power Ltd. |
| 2 | Consultant | Development Consultants Pvt. Ltd. KOLKATA |
| 3 | Plant Title | TSPL, **3x660MW Power Project** |
| 4 | Location | At Vill.Banawla,dist Mansa, Punjab, India |
| 5 | Elevation above sea level | 210 m |
| 6 | Nearest Railway Station | Saada Singh Wala 12 KM from Site |
| 7 | Nearest Town | Mansa |
| 8 | Nearest Airport | Bhatinda |
| 9 | Ambient Air Temperature | |
| a) | Max. Daily mean & average | 49.0 $^{o}$ C |
| b) | Min. Daily mean & average | 0.2 $^{o}$ C |
| c) | Design Wet bulb temperature | 28 $^{o}$ C |

## TECHNICAL INFORMATION ON PLANT & EQUIPMENT

The EPC contractor for the plant is M/S SEPCO-I, China.

All the four units of the power plant are identical. The plant & equipment comprise of the following:

1. Plant water systems
2. Boilers and auxiliaries
3. Turbine Generators and auxiliaries
4. Air compressor
5. Ash handling (Both bottom and fly ash)
6. Coal Handling System
7. Electrical System
8. Control and instrumentation
9. DG & UPS system
10. Waste Water Treatment System
11. Fire-fighting system
12. Air Condition and Ventilation System

## PLANT WATER SYSTEM

## RAW WATER SYSTEM:

Raw water for the plant will be taken from Jagga Canal. Raw water from the Jagga Canal is delivered to raw water Reservoir through Water conveyance system. Raw water from the reservoir is taken to inclined plate filter for the pretreatment through the raw water pump house.

**PRE TREATMENT:**

Raw water treatment system consists of inclined plate filter basin, and gravity filter ,service and portable water basin .The total water requirement for the plant is 5337 cum/hr.

Four numbers of Raw water pumps (3W+1S) each with capacity 1779 Cum/hr. And also provided with four numbers of Service water pumps (3W+1S) each with capacity 753 Cum/hr.

Five numbers of inclined plate filters each with capacity 1340 cum/hr.

Three numbers of clarified water basins each with capacity of 4300 cum/hr is provided which will satisfy the 8 hrs of requirement.

Chemicals dosing system consists of powder plunge equipment, solution preparing tank and dosing pump. Solution preparation tank can meet the Eight hours requirement.

Water for CT make up is going from CW make-up basin15100m3 capacity. 2000m3 storage basin water will be supplied to CW make up basin by two CW transfer pump of capacity of 1372-2744 m3/hr, head 19-11 m, motor power 160 KW (one operating and one standby). From 15100m3 CW make up basin, CW make up supply water to cooling tower basin through three CW make up pumps of capacity 972-1440 m3/hr, head 19.3-12.3 m, motor power 75 KW (two operating one standby).

The clarified water is fed to 2 nos. gravity filters, each having capacity Q=50m3/hr. This filtered water is stored in the potable water basin of capacity 100m3, a part of the 4300m3 service water storage tank. The portable water is pumped to all users after dosing of chlorine for disinfecting purposes. The capacity of each potable water pump is 50 m3/hr.

Service water (SW) for the entire plant is going from service water basin through 4 SW pumps (three operating and one standby), each having capacity of 753 Cum/hr

**D.M.PLANT:**

There are two streams (2 x 100%, each of 150 t/hr capacity).

The service water is fed to DM plant.

The process in DM plant is:

Raw Water

↓

Inclined plate filter basin

↓

Service water pump

↓

DM plant clarified water tank

↓

Clarified water pump

↓

Mechanical filter

↓

Ultra Filtration

↓

Activated Carbon

↓

RO system

↓

Strong acid cation exchanger

↓

De-carbonator

↓

Intermediate water tank

↓

Intermediate water pump

↓

Strong caustic anion exchanger

↓

Mixed bed ion exchanger

↓

DM water Tank

↓

DM water pump

↓

Condensate make up water tank near main power building

.

There are 04 nos. Mechanical Filter (Sand Filter) (MF) to remove coarse/ suspended particles. The mechanical filter is having diameter of 3024mm, there are two layers of filters used for filteration. The above layer are filled with anthracite 400 mm height another layer is filled with quartz sand with height of 800mm.The filtered water from MF outlet common header is then passed through 04 nos Activated carbon filter to remove excess chlorine dosed during clarification. The Activated carbon filter is having diameter of 3024mm, and layer highness made of fruit yolk is 2000mm.

**REGENERATION OF CE, AE & MB:**

In this Cation exchanger and anion exchangers are installed in series. The conductivity meter provided at the out let of anion exchanger will decide the regeneration cycle. When the conductivity is above acceptable limit, cation and anion beds will automatically come to regeneration mode. When the conductivity and silica level at the out let of the mixed bed rise the acceptable limit, mixed bed will come to regeneration mode automatically.

**CW SYSTEM:**

Technical process of circulating water system is as follows:

Circulating water pump

↓

Hydraulic butterfly valve

↓

CW supply line

↓

Condenser & auxiliary coolers

↓

CW return line

↓

Natural draft cooling tower

↓

Water collecting basin

↓

Gravity flow trench

↓

Suction basin of circulating water pump

↓

Isolation Gate

↓

Side stream filters

Circulating water pump

**Circulating water pumps**

2x60% TMCR vertical mixed flow pumps will be installed for each unit; The type and performance of circulating water pump is as follows:

| No. | Item | Units | Parameter |
|---|---|---|---|
| 1 | Number | Set | 6 |
| 2 | Type | | Vertical mixed flow |
| 3 | Capacity (each pump) | $m^3/s$ | 12.8 |
| 4 | Total Head | m | 32 |
| 5 | Motor Power | KW | 5250 |

Hydraulic cut-off check butterfly valve will be provided for outlet pipes of circulating water pumps.

**NATURAL DRAFT COOLING TOWER**:

9500 M2Wet evaporative natural draft counter flow type cooling tower with film type PVC fill material per unit is available.

Circulating water demand at TMCR condition:

| No. | Unit capacity | Condensate steam (T/hr) | Cooling water for condenser ( $m^3/hr$) | Cooling water for Aux. coolers ( $m^3/hr$) | Total ($M^3/hr$) |
|---|---|---|---|---|---|
| 1 | 1 x 660 MW | 1265 | 73792 | 3335 | 91885 |
| 2 | 3 x 660 MW | 3795 | 221376 | 10005 | 275655 |

**QUALITY REQUIRED**:

**FEED WATER QUALITY**

Hardness : ≈ 0 μ mol/L

Dissolve oxygen: ≤ 7 μg/L

Iron : ≤ 10 μg/L

Copper : ≤ 3 μg/L

PH (25 °C) : 9.2 ~ 9.6

Conductivity (after hydrogen ion changed, 25 °C): ≤ 0.2 μS/cm

Hydrazine : 10 ~ 50 μg/L

**MAIN STEAM QUALITY**

Sodium Iron : ≤ 3 μg/kg

Silica : ≤ 10 μg/kg

Iron : ≤ 5μg/L

Conductivity (after hydrogen ion changed, 25 °C): ≤ 0.2 μS/cm

Cooling water Parameters, Corrosion Control and Microbiological Control to be maintained

**BOILER & AUXILIARIES:**

TYPE OF BOILER:

Super-critical, once-through, direct pulverized coal fired with tilting tangential firing single pass, single re-heating, balancing ventilation, dry bottom, and outdoor steel structure type.

TECHNICAL DETAILS:

Manufacturer : HARBIN BOILER Co LTD. China

Rated capacity : 2140 t/h (BMCR)

Quantity : 3 Nos. (For 3x 660 MW units)

Superheater outlet steam pressure : 25.4 MPa (a)

Superheater outlet temperature : 571 °C

Rated RH steam flow : 1732.99 t/h

Rated CRH steam pressure : 4.815 MPa (a)

Rated CRH steam temp : 330.9 °C

Rated HRH steam pressure : 4.605 MPa (a)

Rated HRH steam temp : 569 °C

Feed water temperature at Eco inlet : 293.4 °C

Exit gas temperature corrected : 138 °C (at the outlet of APH)

Hot primary air temperature : 326 °C

Cold air temperature : 44.5 °C

Boiler Efficiency (HHV) : 86.7 %

Boiler coal consumption calculated : 459.7 TPH (design coal)

**Design features of Boiler**

Maximum burner zone heat release rate.: about 1.566 MW/Sq mtr

Maximum heat input per unit plan area. : about 4.432 MW/Sq mtr

Maximum Effective Projected Radiant : about 174.4 KW/Sq mtr

Surface (EPRS)

No. of coal and oil burners. : No. of coal and oil burners-24 and 16 respectively

Furnace Dimension (Height x Width x : Height-64.7 mtr x Width-19.0823 mtr x Depth) Depth-19.0823 mtr

Coal firing stable operation load range : The coal firing stable range will be 40% at BMCR with design coal and without oil support

**Details of combustion system**

Coal pulverizing system is a direct fired pulverized fuel type with raw coal stored in coal bunkers, transferred to mill by coal feeders. Primary air fan supply hot air as medium for drying and transporting to pulverizer. The Primary air Fan will blow the cold air into air preheater. The hot Primary air from air preheater will mix with cold primary air to maintain the mill outlet temperature 70 °C. The mill outlet pulverized coal will be transferred into burners through pulverized coal pipes. Two sets of seal air fan per boiler will be used to seal mill, coal feeder and pneumatic shutoff gate on pulverized coal pipes.

For this project, there are 6 double inlet and outlet tube mills for each boiler, and each mill will serve the burners in the four corners at the same elevation of the corner-fired boiler. The principle in selecting the mill is based on the contract: there are 6 mills for each boiler, when grinding design coal and the worst coal, 5mills could provide 100% BMCR load (the capacity for each mill will not exceed 95% of its design capacity).According to the result of bid, the mill named MGS4760 from SHMP Co. LTD.is selected. The optimal capacity of each mill is 96.8t/h when operate at optimal condition 。 Five mills will be in operation with the design

coal at BMCR condition, the capacity of each mill is 95% of the optimal capacity. All the relevant designs are based on MGS4760 mill in this design.

**Design Criteria**

- Mill : Double inet double outlet tube milll
- No of mill : 6 (5 in operation & 1 stand by) for each unit
- Type : **MGS4760**
- Maximum grinding capacity : 104.7tph
- Mill outlet temperature : 70 °C
- Rated Power of mill motor : 2200 KW,11 KV

**Seal Air Fan:**

Type : Centrifugal

Volume flow : 12 $m^3/s$

Pressure : 7000 Pa

**P.A Fan:**

**Type** : Double stage adjustable moving-blade axial-flow fan

Volume flow : 175 $m^3/s$

Pressure : 13780 Pa

Motor power : 3000KW,11kv

**Coal feeder:**

Rated Capacity : 12 ~80 t/h

Motor : 2.2 KW + 0.55 KW

Number of Coal feeder :12

**Air and flue system**

Balancing ventilation mode is introduced in combustion system which includes a tri-sector rotary air preheater, and the primary air and secondary air are heated in the air preheater at the same time. In this project, the design and configuration could achieve one-side operation when the boiler is at low load or the fans in one side is out of work. There are silencers both for PAF

and FDF at suction. As the EPC contract requested, at a lower environment temperature or when boiler is operated at low load operation condition, in order to prevent the cold end of the air preheater being eroded, steam air heaters are mounted on the duct at the outlet of the FDF, meanwhile, the boiler manufacturer is asked to use anti-corrosion steel at the low temperature section of the preheater. There is an interconnecting duct between the outlet of two FDF of the same boiler, and electrically operated cut-off dampers are mounted both at the inlet of the air side and outlet of the gas side in the air preheater. When any of the FDF has being out of work, the secondary air could go through two air preheaters to get into the furnace from both sides of the boiler. At normal condition, the interconnecting duct can balance the air pressure at the outlets of two fans. Total flow rate that entered the mill and the proportion between temperating air and primary air are determined by quantity of heat and flow rate that needed to dry the coal and carry the pulverized coal, these parameters could be controlled by the adjustable damper.

**Electrostatic Precipitator & Fabric filter:**

High-efficiency ESP+FF(fabric filter) is chosen to purify the gas, the precipitator is 2 electric fields and 3 fabric fields, the dust emission concentration of the gas in the chimney should be less than 50mg/Nm3. The capacity of the precipitator is selected based on +10% gas flow rate, +10 deg C gas temperature and when one power supplier unit is out of service, the dust emission concentration of the gas in the chimney should be less than 50mg/Nm3.

Inlet flue gas temperature : 134.07 °C

Dust loading concentration of gas at outlet : $\leq$ 50 mg/$Nm^3$

De-dusting Efficiency : $\geq$ 99.95%

**Design criteria:**

- **F.D Fan:**

Type : adjustable moving blade axial flow

Air flow rate at inlet : 276 $m^3/s$

Air Pressure : 572.9 Pa

Motor Power : 2100 KW,11kv

- **I.D Fan:**

Type adjustable static blade axial flow

Air flow rate at inlet :701$m^3/s$

Air Pressure :6380 Pa

Motor Power : 5400 KW, 11kv

**Oil firing system:**

Light diesel oil can be used for starting up and the capacity can be up to 10% BMCR. Heavy fuel oil can be used for stabilizing combustion and the capacity can be up to 30% BMCR.

The boiler ignition system is three phases. Primarily, high energy igniters light up LDO guns; secondly, LDO guns ignite HFO guns; lastly, HFO guns kindle coal powder. Every boiler has 16 oil guns--four LDO ones and twelve HFO ones. Mechanical atomization is adopted with LDO guns. Steam atomization is adopted with HFO guns. Max heat capacity input by LDO guns is designed as 10％ boiler heat capacity input at BMCR. Max heat capacity input by HFO guns is designed as 30％ boiler heat capacity input at BMCR. Max LDO guns capacity is 14.2t/h with inlet oil pressure 3.43MPa. Max HFO guns capacity is 39t/h, with inlet oil pressure 1.38MPa.

**Turbine and Auxiliaries:**

Manufacturer : DONGFANG TURBINE FACTORY, China

Type: supercritical pressure, single reheating type, single-shaft, three cylinders and four exhausts, condensing steam turbine.

Model : N660-24.2/566/566

Quantity: 3 Nos. (3nos. for 3x660 MW units)

Main steam : (before stop valve) 24.2 Mpa (a)/ 566 °C

Reheat steam : (before combined intercept valve) 4.249 Mpa (a)/ 566 °C

Main steam inlet capacity : 2003.1 t/h (TMCR)

Reheated steam inlet capacity : 1630.07 t/h (TMCR)

Exhaust pressure : 10.2 KPa (a)

Guaranteed heat rate : 1903.5kcal/kwh

Feed water extraction system : 3 HP heaters + 8 LP heaters + 1 deaerator

Steam seal system : Self-sealing system (SSR)

**System configuration and Main equipment Functions:**

1. Main Steam supply station:
   The main steam supply station consists of high temperature and high-pressure main steam emergency stop valves, electro hydraulic operated control valves, bypass valve and measuring and control instruments.

2. Auxiliary steam system:
   The auxiliary steam system provides steam for the following services during various plant operating modes:

   a. Unit's warm-up steam during start-up
   b. Turbine gland sealing system
   c. SCAPH
   d. Oil handling plant
   e. Aux steam for other units
   f. HVAC system

3. Gland Steam condenser and Gland steam exhauster
   Gland steam condenser is a heat exchanger which is used to condense the shaft end steam leak-off and valve steam (air) leak-off for the recovery of working medium and heat. One of the cooling medium of the gland steam condenser is feed water, therefore during the unit normal operation; feed water will go through gland steam condenser.

4. HP/ LP bypass system
   HP/LP bypass systems are in series & having maximum capacity 60% of BMCR. HP bypass system is connected in between main steam pipe line to CRH line. HP de-superheating water comes from BFP discharge. LP bypass system connects HRH line to condenser. LP de-superheating water comes from CEP discharge. This system is suitable for constant pressure operation & slip pressure operation of the unit. It is used for development the steam parameters during cold startup & avoid re-heater starvation.

***Air Evacuation system***

The condenser air evacuation system will perform two basic functions; To initially evacuate steam space volume of the main condenser and ancillary piping and equipment to reduce the pressure therein to required starting levels (hogging mode);To remove non-condensable gases collected in the condenser air removal zone (holding mode) during normal operating models.

Three 50% capacity mechanical rotary vacuum pumps will be provided, two pumps work together under normal operation condition, three pumps work together to shorten the startup time during start up period. Rating capacity of vacuum pumps is 60kg/h (dry air). Motor operated vacuum breaker valves will be sized and furnished for installation on condenser shells in accordance with turbine manufacturer recommendations.

**Turbo generator oil system**

The oil system in steam turbine units are used for followings:

- Supply lubricating oil to all bearings and turning gears
- Generator seal oil system
- Turbine & BFPT governing system

The oil system of steam turbine units mainly consists of the lubricating oil system, the shaft jacking oil system & oil filtration system. The lubricating oil system consists of main oil tank ($75m^3$), main oil pump, and oil injector. AC lubricating oil pump, DC emergency oil pump, overflow valve, oil cooler, switching valve, exhausting unit, ultrasonic oil level Detector and other instruments for measurement and control system.

***Feed water system***

- Feed water system will deliver feed water from deaerator to boiler. During this process feed water is heated to improve cycle efficiency utilizing turbine extraction steam in HP feed water heater.
- The system is equipped with three sets of (3x50%) boiler feed water pump (2 nos. TDBFP + 1 MDBFP) for each unit.
- Each pump is furnished with one booster pump
- The motor driven feed water pump has hydraulic coupling.
- The system consists of a single string of three (3) HP Feed water heaters piped in series. The feed water heaters are horizontal, surface condensing. Heater having group bypass system (out of service from the system when any one of 3 HP heaters is out of service).
- All BFP provided with its minimum recirculation valve returning to the deaerator respectively.

***Condensate system***

- There are two condensate extraction pumps (CEP) whose suction is taken from Hotwell. After the condensate pumps, the condensate delivered to the Deaerator storage tank through a gland steam condenser (GSC) and four LP Heaters. During this process the condensate will be heated by turbine extraction steam in low pressure heaters & deaerator.
- The system incorporates two nos. (2x100%) constant speed electric motor driven vertical centrifugal type condensate extraction pumps (1 operation + 1 standby).
- The system combined with four surface LP heaters and one integrative deaerator, Each LP heater will be furnished with its own bypass. In case of tube leakage, the relevant heater will be switched off.- No.7 and No.8 LP heater is furnished with the common bypass.
- A set of control valves adopted on main condensate piping to adjust Deaerator water level. Steam is drawn to deaerator from No 4 extraction in normal condition & from auxiliary steam in start-up condition.
- The pumps furnished with a minimum recirculation line installed from the downstream of the gland steam condenser and returning to the main condenser.

**Heater drains & vents system**

**Function**

The heater drain and vent system will provide the following functions:

- Draining and recovering condensated extraction steam from feed water heaters.
- Venting non-condensable gases from feed water heaters.
- Providing supplemental feed water heating by cascading drains from higher pressure to lower pressure heaters
- Providing turbine water induction protection (include emergency drain system).

**Cooling water system**

Cooling water system is divided into two systems:

- Closed Cycle Cooling Water system (CCCW)
- Open Cycle Cooling Water system (OCCW)

CCCW system uses demineralized water as working medium. Because of this corrosion of the cooling equipments decreases & heat exchange efficiency increases. It avoids the jamming of flow path thereby increasing reliability & reducing the maintenance time. Two (2x100%) CCCW pumps & two (2x100%) water-water heat exchangers are installed in CCCW system.

OCCW system takes water from CW pump outlet pipe, which is filtered by electrical strainer followed by an increase in pressure by pressure pumps. After cooling the equipments the return line is connected to the CW return pipe system.

**CW water system in main power house:**

The CW water system in main power building will transport CW to condenser which coming from CW supply header through CW pump, in order to take away residual heat carried by exhaust steam of turbine or turbine driving pump or other flows, and condensate them to water..

The CW system in main power building is designed to work when water temperature is at design temperature and turbine works under VWO condition, at that time condenser receives most steam condensate and other flows, and its back pressure arrives at rating average pressure 10.2kpa(a)).

The cooling tower outlet temperature is 35.4℃ under TMCR condition.

The CW adopts cooling tower system. One Dn3200 water supply header will be derived from cycle water pump house, separated into two Dn2400 branch pipes aside colonnade A. Water fist go into the LP condenser, then go through inter-connecting pipe of condenser into the HP condenser. Two Dn2400 water return branch pipes will be derived out the turbine hall. After incorporating into one pipe, they will be derived to cycle cooling tower. The motor-operated butterfly valve will be installed in both cycle water supply and return pipe rolling shutter.

In order to keep the condenser pipes clean & free from suspended solids a set of rubber ball cleaning equipment is installed. Each set is composed of ball collector, rubber ball recirculating pump, ball screen & pipes, valves & process control device. During operation this system can be intermittently or continuously put into operation to keep the pipes clean.

## AIR COMPRESSOR:

There are total 02 compressor house, 01 is for ash handling system and 01 is for Main plant instruments & service air requirement

Instrument air Compressor

No of Compressors : 5 numbers screw compressors

Capacity of Compressors :30nm3/min, P=0.80mpa

Drier Type :Regenerative type

Capacity and number of driers:50nm3/min and 4 numbers

Ash Compressors

No of Compressors : 17numbers screw compressors

Capacity of Compressors :60nm3/min, P=0.80mpa

Drier Type :Regenerative type and refrigerant type

Capacity and number of driers : 4Regenerative type of 50nm3/min and 11 nos refrigerant type of 90nm3/min

The function of compressed air system is to supply all kind of compressed air for different purpose:

- The control & instrumentation air,
- Service air &
- Pneumatic fly ash conveying compressed air

Each set consists of for all three units:

Three control & instrumentation air receivers (V=30 m3)

12 fly ash conveying/ service air receivers (V=50 $m^3$)

## ASH HANDLING SYSTEM:

The ash handling system consists of the following sub-systems:

1. Bottom ash handling system
2. Bottom ash water recovery system
3. Fly ash handling system
4. High concentrate slurry disposal system (HCSD)

**Bottom Ash handling system: (1 set for each boiler)**

High temperature bottom ash discharged to scrapper chain conveyor through bottom ash hopper. Here ash is quenched & ground by clinker grinder then conveyed to ash slurry sump through the basalt lined trench with the help of water jet nozzles. Bottom ash slurry is pumped to dewatering bins from the sump with the help of bottom ash slurry pumps.

The function of bottom ash handling system is to collect & extract ash from the boiler furnace bottom on a continuous basis. Each set consists of:

1 no. submerged scraper chain conveyor (capacity: 40~80 t/h, and speed 15m/min)

1 no. clinker grinder ( granularity: ≤ 25 mm)

2 nos. slurry centrifugal pumps (2x100%) (Q = 535 $m^3$/h, H = 60m)

**Bottom Ash water recovery system: (1 set for two boilers)**

The function of this system is to clarify/ settle & cool the recirculation bottom ash water separated from bottom ash slurry for various use. After bottom ash slurry pumped to dewatering bin, water overflows & separated to high efficient concentration settling tank. After the filtering, settling, clarifying & cooling of water therein, the decanted water from settling tank overflows to ash water pond for further clarifying & cooling. The clarified water from ash water pond is finally pumped by HP/ LP pumps for various purposes.

The system consists of following equipments

- Settling tank two numbers one for unit no1&2 nd one for Unit no.3
- Surge tank one for unit number 1&2 and one for unit number 3
- 3number HP water pump Q=105m3/hr,H=90m for unit no 1&2 and two pumps of same capacity for unit no.3.
- 3Numbers Lp water pumps of Q=610m3/hr ,h=50m for unit no.1&2 and rwo pumps of same capacity fo unit no.3.

**Fly Ash Handling System: (1 set for each boiler)**

The dense phase pneumatic conveying system will be used for the fly ash handling system. According to the system requirement, the following main equipment will be equipped with for each design unit （for each boiler）.

- One set of dense phase conveyor for each hopper of economizer, air heater and, precipitator ESP & FF for conveying system
- Three set of pipes for conveying system. Evacuation time is about 40~80s for ash removal from ash hopper to silo.
- Two fluidizing blowers （one working and one standby） for hoppers, 15m3/min.
- One fluidizing air heaters for hoppers.
- One RCC fly ash silo, Φ15m, 2650m3, effective height is 13m.
- One bag filters for one fly ash silo, particulate in exhaust shall not more than 50 mg/Nm3.
- One dry ash unloader for one fly ash silo.
- One wet ash conditioner/unloader for one fly ash silo.
- Four fluidizing blowers （three working and one standby） for three fly ash silos（for three boilers）.
- One fluidizing air heaters for one fly ash silo.

**HCSD system:**

After dewatering of bottom slurry in the dewatering bin, bottom ash is fed to 2nd stage clinker grinder through vibrating feeder & belt conveyor. The grinder is grinding the bottom ash to required size which can easily handled by HCSD pumps. Bottom ash after clinker grinder is fed to agitated retention tank, where the fly ash from fly ash silo comes by screw paddle feeder & mixed with bottom ash. Thus slurry of high concentration (60 – 70%) is formed & pumped by piston pump (Putzmeister make pump) to ash pond. Each set consists of:

- Three dewatering bins of 750m3 for unit 1&2 and Three bins of 350m3 for unit no.3.
- Four number of paddle mixtures of 220tph capacity.
- Four number piston pump for high concentration slurry to ah pond of 292m3/hr,55 bar.

## COAL HANDLING SYSTEM:

### Coal source and Characteristics

The coal for the power station will be made available from Mahanadi Coal Limited (MCL) / South Eastern Coal Ltd. (SECL) Coal Fields of State of PUNJAB located at a distance of about 1500km.Coal transportation is envisaged through BOXN wagons.

### Mode of Coal Transportation

The primary mode of coal transportation is by coal rakes. The coal that is transported is wagons (rack) and will be discharged into the wogon-tripler.

### System Description

Unloading system

Coal for the power plant will be transported from coal fields to wagon tippler working area by BOX N wagons. There will be 58 wagons with capacity of 60 tons per wagon and the total weight of one rake is under 110t.There will be 4 wagon tipplers in unloading system. The unloading capacity is about 20 tips/ hour, through-out layout. The type of Wagon tippler as C type rotary .The locomotive don't pass through wagon tippler. The Elevation for top of Rail Level as 213.12 m. There are two Wagon Tippler hoppers (four compartments). Capacity of each compartment of wagon tippler hopper shall be approximately 120 T. One conveyor with rated capacity of 1250 t/h is installed under each wagon tippler, total four (4). Four（4）paddle feeders is installed at the bottom of hoppers .The rated capacity of each feeder is 300-1250t/h, paddle feeder is VFD control. The output of belt conveyors should match the output of wagon tipplers.

### Coal conveying details

- The coal conveying system will be composed by thirteen（13）conveyors from C1 to C13, thirteen（13）Transfer towers and One（1）crusher house.
- The specification of C1 will be: belt width of 1400mm, belt speed of 2.5 m/sec, rated capacity of 1250t/h.
- The specification of belt conveyor from C2 to C12 will be: belt width of 1600mm, belt speed of 3.15 m/sec, rated capacity of 2500t/h.

- The specification of belt conveyor C13 will be: belt width of 1800mm, belt speed of 2.5 m/sec, rated capacity of 2500t/h.
- C1 will be comprised of four parallel conveyors A/B/C/D. C7 will be three (3); other conveyors will have two （2） conveyors each. One（1） operating the other standby. All conveyors have the ability of operating at the same time.
- The maximum belt slope of belt conveyors shall be 15 deg for uncrushed coal and 17deg for crushed coal.
- Thirty four（34）Electric drive double sides ploughs will be installed on C13 that can unload coal into Coal bunker .

**Coal Stockpile (storage Yard)**

There are two（2）bucket wheel stacker cum reclaimers in coal stockyard. Design Capacity ：stacking 2500t/h， reclaiming：2500 t/h, boom length：35m. Total four（4）stockpiles. And the length of each coal stockpile will be 750m, width will be 44m and height will be 13.5m. There will be 999952 T in four (4) piles of coal stockpile. It could maintain thirty (30) days design coal requirement for three boilers consumption at BMCR condition

**System Control**

**P**rogram Control, Protection and monitoring system are furnished in CHP.

Local Control Furnished for Coal Handling Plant.

**Details of Main Equipment**

**Conveyor System**

- The belt conveyors completed with drive mechanism, belt pulleys, idlers, Belt Cleaning devices, take-up, backstops, stringers and supports, Skirt Boards and safe guards etc.
- Safety devices provided to allow safe operation of plant and conveyors including alarms, trip switches, interlocks, emergency pull chord switches along the length of all conveyors etc.
- Enclosed galleries are provided for proper ventilation & illumination. The Galleries provided with windows and translucent sheet for lighting.
- Underground tunnels equipped with proper ventilating equipment.
- The coal conveyors and coal transfer plant have a complete interlock system to ensure smooth operation.

**Screening & Crushing Equipment**

- Four（4）Roller screens and four（4）Ring hammer crushers are installed in crusher house. Two（2） Roller screens and two（2）Ring hammer crushers are installed under C3A. Others are installed under C3B. One（1）electric driven splitter is installed under C3 A. The coal can be separate uniform double streams and drop into two （2） Roller screens. C3B is the same as the C3A.

- The design capacity of Roller screen is 1250t/h. The size of coal inputted will be ≤ 350mm , The size of coal under screen will be≤30mm.
- The design capacity of Ring hammer crusher is 1250t/h. The size of coal inputted will be≤350mm, The size of coal output will be≤30mm.
- On line temperature and vibrating monitor and ZSS are installed for crushers and it could be hooked up to centralized vibration analysis system.

**Stacker & Reclaimer**

- There are two（2）bucket wheel stacker cum reclaimers in coal stockyard. Design Capacity stacking 2500t/h, reclaiming：2500 t/h, boom length：35m.
- Stacker/reclaimer equipped with spray nozzle for dust suppression.

**Magnetic Separator and metal detectors**

- Four（4） Belt-type magnetic separators for belt width 1400mm will be installed above the head pulleys of C1.
- Two（2） Hang-type magnetic separators for belt width 1600mm will be installed in the middle of C3 and C12 separately, total four(4).
- Two（2） Metal detectors for belt width 1600mm will be installed in the middle of C3 and C12 separately, total four (4).
- magnetic separator： 1100 Gauss at 400 mm distance in hot running conditions。

**Coal sampling system**

- Two（2）sampling devices will be installed in No.1 sampling house and No.2 sampling house at the middle of C3 and C12 conveyor gallery separately, total four (4). Coal sampling system will be automatic type。.

**Belt Scales**

- Two（2）belt scales will be installed at the middle of C3 and C12 separately, total four (4).
- Motional circle chains will be installed as calibration device for belt scale, total four (4).
- Belt scale range：20% to 120% of design capacity requirement with 100% overload protection.
- Belt scale accuracy：±0.5% throughout the range。

**Coal Dust Control**

- The dust control system consists of the dust suppression system and dust collection system. The water nozzle type dust suppression system is provided for the unloading/transfer points and coal stock pile.
- The dust collection system is provided for the transfer towers, crusher house and coal bunker.

**Auxiliary Equipment**

- Auxiliary system such as ventilation, dust removal, firefighting, lighting and communication are provided.
- The hoisting equipments in the system such as Crane, Electric Hoist are installed suitably at: 1. Transfer Tower 2. Crusher House 3 Bunker bay and 4. Bulldozer garage.

**ELECTRICAL SYSTEMS:**

Generator Details

Make : Don Fang Electric Corporation

Model : QFSN-660-2-22A

**Model : QFSN-300-2-20B**

**Quantity : 3 Nos**

Rated Output (MW) : 660MW, 3 Φ Stator winding Water cooled

Stator core and rotor winding-Hydrogen

Excitation type : static

ii) Rated Frequency (Hz) : 50 Hz

iii) Rated Power Factor : 0.85

iv) Rated terminal voltage : 22kV

v) Rated Speed : 3000 rpm

vi) Rated Phase Current : 20377.1A

vii) Excitation Current at rated output. : 4484.5 A

viii) Short Circuit ratio

(without negative tolerance). : ≥0.5

ix) Direct axis synchronous reactance

(unsaturated) Xd : 218.15%

x) Direct axis transient reactance

(unsaturated) Xd' : 27.78%

xi) Direct axis sub-transient reactance

(unsaturated) Xd" : 19.76%

xii) Capacity of Excitation Transformer : 3X2500 KVA, dry type

xiii) Excitation current : 4484.5A

xiiii) Excitation voltage : 960V

**Parameters of Generator Transformer**

i) Rated Capacity (MVA) -- 270MVA

ii) Type -- Single phase oil- immersed conservator type

iii) Ratio -- 420±2x2.5%/22kV

iv) Vector Group -- YN, d11

v) Impedance Voltage -- 14%

vi) Temp. Rise

Top oil by thermometer -- 45 °C

Winding by resistance -- 55 °C

**Parameters of Unit Transformer**

i) Rated Capacity (MVA) -- 76/45-45

ii) Type -- Three phase oil-immersed conservator type with

iii) Ratio -- 22×1.25%/11.5-11.5kV

iv) Vector Group -- D, yn1-yn1

v) Impedance Voltage -- 17.2%

vi) Temp. Rise

Top oil by thermometer -- 45 °C

Winding by resistance -- 55 °C

**Parameters of Station Transformer**

i) Rated Capacity (MVA) -- 76/53-53

ii) Type -- Three phase oil-immersed conservator type

iii) Ratio -- 400x1.25%/11.5-11.5kV

iv) Vector Group -- YN, yno-yno(+d)

v) Impedance Voltage -- 20%

vi) Temp. Rise

-- Top oil by thermometer -- 45 °C

Winding by resistance -- 55 °C

All other attachments like Generator stator water coolers / air coolers, Exciter, HT Bust ducts, NGR, UAT's, HT and LT power distribution including, Relay panels, MCC's, PCC'S, Control Panels as required.

**Control and Instrumentation**

Automation level and CCR layout

- Automation level of units will meet requirement of auto startup/shutdown of function class. In accordance with technical process system, automation systems will be divided into some independent sub-systems, i.e. control sub-group and driver control.
- Automation systems of power plant will be composed of Distributed Control System (DCS) and control system of auxiliary systems. Design principle is control function decentralization and information centralized management.
- Startup/shutdown of unit, supervision of running state and handling abnormal condition and urgency accident etc. in CCR will be realized with the help of minimum number of local operators. Provision to be kept in the unit control desk for PA (public address) System / EPBAX system operator console, detailed description refers to 17 of 373-F2491C-D-01 ◦
- Supervision and control of unit will be composed of DCS and other thermodynamic control systems, DCS is the main part. In CCR operator stations with LCD and keyboard / mouse will be the main control and monitoring interface. The system will be governed by the operating system running in a real time mode. It will be Microsoft Windows 2000/ Window XP based system.
- When serious failure of DCS is happened (for example loss of power, communication interrupt, all operator stations fault, important controller fault etc.), the unit can be auto shut down. And can shut down safely under the rule of "fail-safety" through the several hardwired emergent pushbuttons that mounted on the operator console in order to protect person and equipment. These pushbuttons must be hardwired and independent from the DCS.

I&C automation function

Distributed control system (DCS) is the main control system of each unit. In addition to DCS, control system includes digital electro-hydraulic steam turbine control system (DEH), BFPT micro-electro-hydraulic control system (MEH), turbine emergency trip system (ETS), BFPT micro-emergency trip system (METS), turbine supervisory instrument (TSI), BFPT micro-supervisory instrument（MTSI）, turbine and auxiliary vibration Transient Data Management (TDM).

## Emergncy Power supply mngment and UPS

### DG set

The plant is provided with an emergency AC supply facility comprising DG Power for complete station. The Capacity of DG set is considered loss of normal supply due to any contingency. The DG sets have AMF (Auto Mains Failure） feature capable of starting picking up load Within 30 seconds. The minimum load is considered will be safe shut down, essential lighting lift and charging of storage batteries. DG switchgear is have inter-connection among themselves for reliability purpose. There are three DG sets for complete station and each DG set will be sized on the basis of emergency loads of one unit. In the case of failure of the normal power supply, this emergency supply will be guaranteed by the automatic start-up of the diesel generator set. Emergency loads will start-up in batches.

The capacity of each DG rated 1200kW.

### DC System

Main building unit DC system, network control building DC system, coal handling building DC system and water area DC system are provided for the power plant DC load.

### AC uninterruptible power supply (UPS）

AC uninterruptible power supply (UPS） is provided for essential loads such as instrument, control and computer and shall include loads which are required for post-incident monitoring and recording following a unit trip and loss of station AC supplies. The supplies shall be maintained for a minimum period of 30 minutes. Each unit UPS system have 2x100%（ 2x80kVA） systems of on line type capable of supplying the total system load and complete with static transfer switch and maintenance bypass switch. UPS DC power supply in main building shall be supplied from dedicated DC system. The dedicated battery for UPS will be supplied. The DC system for UPS will have 2×100% 400Ah VRLA battery. Each set has 104 batteries.

## Waste Water system

The waste water treatment plant will treat various kind’s waste water from the plant to satisfy the requirement of standard for treated effluents from each stream. The treated waste water will be collected to the central monitoring basin.

The combined effluent collected in the central monitoring basin will be reused in order to minimize the quantum of effluent discharged from the plant. Any effluent discharged outside the plant boundary will meet all the standards stipulated by the local pollution control board.

The system consists of the following:

- Coal handling plant waste water treatment
- Oily waste water treatment
- Domestic sewage treatment

## Firefighting system

- The fire-fighting system is responsible for protecting the whole power plant. The fire-fighting system will consist of water fire-fighting system, inert gas firefighting system, foam protection system, portable fire extinguishers and the fire alarm and detection system. The hydrant fire-fighting system and the spray fire-fighting system will be provided separately, and the ring pipe net of them will be provided, too. The water fire-fighting system will consist of hydrant fire
- Firefighting pumps, spray firefighting pumps, water hydrant system and water spray system. The foam fire-fighting system will consist of foam proportional mixer & storage tank, foam generators, foam hydrant, squirt gun and pipe.
- The design and construction of the fire detection and protection equipment will be to internationally accepted standards and in compliance with the regulations of the Tariff Advisory Committee and other relevant statutory requirements for the licensing and fire insurance (with minimum premium) of the complete power stations.
- Firefighting water system is provided with hydrant fire pumps(one motor driven firefighting pump, one diesel engine driven pump, two motor driven jockey pumps) ,spray fire pumps(one motor driven firefighting pump, one diesel engine driven pump, two motor driven jockey pumps), each with 100% capacity. The firefighting pump can be started manually in the firefighting pump house. When the pressure of the firefighting water pipe network drops down to a specified pressure, the motor driven or diesel engine driven firefighting pump will start automatically. Two motor-driven jockey pumps will be furnished to maintain the pressure. If this pump cannot maintain the pressure or loses power, motor driven pump will automatically started.

## HVAC

### Ventilation system

Air supply （from both the sides of the TG bay) through evaporative cooling units & exhaust through power roof ventilators in turbine hall. Four evaporative cooling units & eighteen power roof ventilators are provided for each unit， and fourteen power roof ventilators are operating， four is standby.

### Air conditioning system

Separate central all-air conditioning system shall be furnished for CCR & EER.

Two AHU are provided for each AC system. One is operating， the other is standby， Each AHU have primary and middle efficiency filters, cooling coil section， humidifier section, muffler section. The ventilation rate of CCR AC system is 80000m3/h， 50000m3/h for 2# and 3# EER， 25000m3/h for 1# EER The fresh air quantity shall be exceeded 10% of total. Smoke extractor shall be provided and air conditioning system shall be interlocked with smoke/fire detectors. The 40mm think centrifugal glass wool heat insulation board is furnished for air duct. The 0.5mm thick aluminum alloy sheet is furnished for the air conditions duct.

The chilled water for AHU comes from refrigerating plant room of CCB. The temperature of supply and return chilled water is 7/12 deg C.

CHP control room,chemical laboratory ,DM plant control room, the package air conditioning unit is provided. For other area like ESP control room, switchyard control room, etc. C&I laboratory & stores, Electrical Instrument room,relay testing room, elevator machine room, excitation cubicle, battery battery charger room etc. are provided with Split type Air conditioner.

**Dust Extraction for CHP**

Dust extraction system with pulse jet type bag filter（efficiency is 99%）is provided to extract dust laden air from all the dust generating points in crusher house， coal bunker and transfer towers. In DE system, the air to cloth ratio of the bag filter is maximum 150 cum per hr. per sq.m.

**Ventilation system in CHP**

The mechanical ventilating system is provided for underground of Wagon tippler， transfer towers， and conveyor gallery. The ventilation rate shall be about 15 air change/ hr. Fan boxes with primary， middle efficiency filters will be put in the ventilation machine room. The supply air will be transported through duct so that air velocity in conveyor gallery hopper shall not exceed 0.5m/sec. The exhaust air will be transported through air shaft by power roof ventilators.

## ANNEXURE B - FUEL SPECIFICATIONS

### COAL ANALYSIS

| Sl no. | PARTICULARS | UNITS | Design Quantity | Worst Quantity |
|---|---|---|---|---|
| 1. PROXIMATE ANALYSIS % by weight: | | | | |
| 1.1 | Moisture (Total) | % | 11.9 | 15 |
| 1.2 | Ash | % | 41.6 | 45 |
| 1.3 | Fixed Carbon | % | 24.5 | 22 |
| 1.4 | Volatile Matter | % | 22 | 21 |
| 1.5 | Gross Calorific Value | kcal/kg | 3300 | 3000 |
| 2. ULTIMATE ANALYSIS % by weight: | | | | |
| 2.1 | Carbon | % | 36.5 | 31.9 |
| 2.2 | Hydrogen | % | 2.0 | 1.8 |
| 2.3 | Sulfur | % | 0.4 | 0.6 |
| 2.4 | Nitrogen | % | 1.2 | 0.9 |
| 2.5 | Moisture | % | 12 | 15 |
| 2.6 | Ash | % | 41.6 | 45 |
| 3.0 | Hard grove Grind ability Index (HGI) | | 45 | 42 |

**FUEL OIL ANALYSIS**

| Sl. No. | Description | HFO | LDO |
|---|---|---|---|
| (a) | Specification | IS: 1953 grade HV | IS: 1460 |
| (b) | Total Sulfur Content | 4.5% Max. | 1.0% |
| (c) | Gross Calorific Valve(kcal/kg) | 11000 | 10000 |
| (d) | Pour Point (Max.) in °C | 24 | 3 (15 for summer) |
| (e) | Flash Point in °C | Min. 66 | 66 |
| (f) | Water Content by Volume | Max. 1% | 0.5% |
| (g) | Sedimentation by weight | 0.25% | 0.05% |
| (h) | Ash Content by weight | 0.1% | 0.01% |
| (i) | Acidity (in inorganic) | Nil | Nil |
| (j) | Kinematic viscosity (cst) | 180 (at 50°C) | 2 ~5 (at 40°C) |
| (k) | Specific heat (Kcal/ KG °C) | 0.5 | - |

## ANNEXURE C -RAW WATER ANALYSIS

| SL NO | CONSTITUENTS | CONCENTRATION |
|---|---|---|
| 1 | PH value | 7.4 – |
| 2 | Colour | Colourless |
| 3 | Temperature | 27℃ |
| 4 | Total Suspended Solids (mg/l) | Less than 100 |
| 5 | Total Dissolved Solids (mg/l) | 138 |
| 6 | Oil & Grease (mg/l) | Less than 2 |
| 7 | Potassium (K) (mg/l) | 2 |
| 8 | Chlorides as C1 (mg/l) | 10 |
| 9 | Calcium (Ca++) (mg/l) | 29 |
| 10 | Sulphate as SO4 (mg/l) | 25 |
| 11 | Sodium as Na (mg/l) | 6 |
| 12 | Zinc as Zn (mg/l) | 0.04 |
| 13 | Iron as Fe (mg/1) | 1.8-2.2 |
| 14 | Silica, (mg/l) | 2.58 |
| 15 | Total Alkalinity experienced as CaCO3 | 75 |
| 16 | Dissolved CO2 | 7.2 |
| 17 | Dissolved O2 (mg/l) | 6.9 |
| 18 | Colloidal silica | 18.42 ppm |

## ANNEXURE D - PLANT ENVIRONMENTAL DATA

| Sl No | Description | UOM | Designed Value |
|---|---|---|---|
| 1 | SPM | mg/Nm3 | <50 |
| 2 | Nox | ppm | <262 |
| 3 | CO (based upon O2 content of 6%) | ppm | <100 |

The emissions of Sox, NOx, SPM shall be as per the Norms set forth by the Pollution Control Board and as proved at the time of Performance Acceptance Test.

## ANNEXURE - E - CONTRACT GUARANTEE

| | |
|---|---|
| Declared Capacity (DC) | 90% |
| SHR | 2223 kcal/kwh or PG Test Value |
| Secondary Fuel Consumption (SFC) | 0.5 ml/kwh |
| Auxiliary Power Consumption (APC) | 7.5% or PG Test Value |
| Unloading of Rakes | Within 7 hours |

**PLANT COMMISSIONING DATES**

| **Units Commissioning Dates** | |
|---|---|
| Unit #2 | 5-Jul-14 |
| Unit #3 | 25-Nov-15 |
| Unit #1 | 25-Aug-16 |
| Station | 8-Sep-16 |

## ANNEXURE F- HSE CLAUSES

### Introduction

In TSPL we are committed to the protection of Health and Safety of our employee, contractors and stake holders as well as the protecting of our assets and environment. Zero harm and Zero waste needs active involvement of contractors and their employee who carry out a large percentage of work and are exposed to the associated to HSE Risk.

To inculcate safe practices, TSPL follows Vedanta Sustainability frame work and ensure its 100% compliance. Entire framework of Vedanta Sustainability Framework has been captured into 9 Policies, 18 Nos Technical standards, 14 Management standards and various guidelines notes. To ensure Zero Harm Various Safety and Environment Performance standard are in place. List embedded in the document.

The works should be undertaken in accordance with the applicable international guidelines, standards and specifications on HSE (ICMM / IFC/ OCED etc.)

### O&M contractor HSE Obligations

**Compliance of Acts/Rules/Gazette notifications/office memorandums/Supreme court guidelines/orders. Few important Acts and / Rules are as under**

1. Compliance to all statutory requirements but not limiting to Factories Act, 1948, Punjab factory rules 1952, Punjab Major Accident Hazard control Rule, Punjab Fire prevention Act, Motor Vehicles Act as amended in 1994, The Central Motor Vehicles Rules, 1989, Indian Road Congress Code IRC: SP: 55-2001_Guidelines on Safety In Road Construction Zones, The Petroleum Act, 1934 and Rules 1976, PESO Requirements, Gas Cylinder Rules, 2003, The (Indian) Boilers Act, 1923, Indian Electricity Act 2003 and Rules 1956, National Building Code, 2005, Indian Explosives Act, 1884 along with the Explosives substance Act, 1908 and the Explosives Rules, 1983, Environmental (Protection) Act, 1986, Environmental (Protection) Rules, 1986, Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, E-Waste (Management) Rules, 2016, Air (Prevention and Control of Pollution) Act, 1981 & Air (Prevention and Control of Pollution) Rules 1982, The Environment Impact Assessment Notification, 2006, The Noise Pollution (Regulation and Control) Rules, 2000, The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989, Water (Prevention And Control Of Pollution) Cess Act, 1977 and Water (Prevention And Control Of Pollution) Cess Rules, 1978, The Water (Prevention and Control of Pollution) Act, 1974& The Water (Prevention and Control of Pollution) Rules, 1975, Guidelines for Abstraction of Ground Water for Industrial/Infrastructure project proposals in Non-Notified Areas , The Batteries (Management and Handling) Rules, 2001 & Amendment Rules, 2010, Fly ash utilization notification, 1999 & amended there on, Bio Medical Waste (Management and Handling) Rules, 2016, Forest conservation act, 1980, The Plastic Waste Management Rules, 2016, The Solid Waste Management Rules, 2016 , The Construction and Demolition Waste Management Rules, 2016, The Ozone Depleting Substances (regulation and Control) Rules, 2000, The Public Liability Insurance Act, 1991 & amended there on and other

acts/rules/notifications/memorandum/guidelines issued by Central/State Govt. from time to time.

2. O&M Operator has to Comply of all EC/CTO/NOC/authorization conditions including critical conditions- Greenbelt development & maintenance in 700 acres, achieve of 50 mg/Nm3, 100% fly ash utilization, obtain of public liability insurance, maintain of zero discharge.

3. O&M Operator has to submit monthly/quarterly/half yearly/annual reports to statutory bodies under various Acts/rules/notification/clearances/authorizations. O&M Operator has to establish of environmental lab, maintenance of all monitoring equipment's, O&M of CAAQMS, digital display board, CCTV cameras, online water analyzers and CEMS, ensure continuous data transfer to CPCB and PPCB.

4. O&M Operator has to monitor all HSE performance parameters (Air, water/wastewater, noise, ambient air, soil, leachate studies, hazardous waste, sludge, fly ash, coal, dust, heat, stress, chemical vapors, humidity etc.) as per frequency mentioned in clearances or in acts by internal or by engaging PPCB approved/MoEF&CC recognized/ NABL accredited lab.

5. O&M Operator has to ensure calibration of all monitoring equipment and maintain of sufficient stock of consumables

6. O&M Operator has to prepare waste management plan, provide all handling facilities, tie-up with approved agencies for safe disposal of wastes.

7. O&M Operator has to ensure proper housekeeping through engaging vacuum machines along with slurry pumps.

8. O&M Operator has to ensure to meet all discharge standards, emission norms, ambient air quality, noise and other standards stipulated by statutory bodies

9. O&M Operator has to maintain existing lawns/gardens and development of new lawns/gardens.

10. O&M Operator has to Operate &Maintain of all pollution control equipment's (Hybrid ESP’s, bag filters, dust suppression, ETP, STP, zero discharge unit, ash pond etc.)

11. O&M Operator has to Operate &Maintain O&M of rainwater harvesting system.

12. O&M Operator has to conduct of special studies by engaging third party if required by statutory bodies.
13. O&M Operator has to coordinate in obtaining of statutory clearances such as CTO renewals, hazardous waste authorization & Bio-medical waste authorization renewals, renewal of NOC of ground water withdrawal, fire clearances renewals/building drawing approvals, necessary amendments of CTO/EC, obtain of approvals for future projects from Central/State Govt.

14. O&M Operator has to Comply of all EC/CTO/NOC/authorization conditions including critical conditions- Greenbelt development & maintenance in 700 acres, achieve of 50 mg/Nm3, 100% fly ash utilization, obtain of public liability insurance, maintain of zero discharge.

15. O&M Operator has to submit monthly/quarterly/half yearly/annual reports to statutory bodies under various Acts/rules/notification/clearances/authorizations. Submission of reply/clarifications to letters from statutory bodies.

16. O&M Operator has to establish of environmental lab, maintenance of all monitoring equipment's, O&M of CAAQMS, digital display board, CCTV cameras, online water analyzers and CEMS, ensure continuous data transfer to CPCB and PPCB.

17. O&M Operator has to monitor all HSE performance parameters (Air, water/wastewater, noise, ambient air, soil, leachate studies, hazardous waste, sludge, fly ash, coal, dust, heat, stress, chemical vapours, humidity etc.) as per frequency mentioned in clearances or in acts by internal or by engaging PPCB approved/MoEF&CC recognized/ NABL accredited lab.

18. O&M Operator has to ensure calibration of all monitoring equipments and maintain of sufficient stock of consumables

19. O&M Operator has to Operate &Maintain of all pollution control equipment's (Hybrid ESP's, bag filters, dust suppression, ETP, STP, zero discharge unit, ash pond etc.)

20. O&M Operator has to Operate &Maintain O&M of rainwater harvesting system

21. O&M Operator has to conduct of special studies by engaging third party if required by statutory bodies.

22. O&M Operator has to conduct Risk Assessment/JSA for all works to decide on priorities and to set control measures for eliminating hazards and risks identified.
23. O&M Operator has to strictly follow Vedanta Sustainability Safety and Environmental Standards apart from General National and International best Safety practices viz

    a. Working at height
    b. Confined space entry
    c. Electrical Safety
    d. Isolation & LOTO includes Personal LOTO
    e. Vehicle & Driving
    f. Ground control
    g. Crane and Lifting
    h. Waste management
    i. Water management
    j. ESIA
    k. Energy management
24. O&M Operator shall facilitate smooth functioning of Occupational Health Centre (OHC) along with adequate equipment (including ambulance) and dedicated & qualified staff and qualified Occupational Health doctor round the clock by providing in compliance with

statutory authority. Tie-up with reputed hospitals for PME of employees or for further better treatment.

25. O & M Operator shall conduct Industrial Hygiene Audit at periodic intervals, They will have to ensure workplace monitoring such as Noise, illumination, Heat Stress, Vibration & Ergonomics.

26. O&M Operator shall facilitate First aid boxes at all required locations and maintain at regular intervals.

27. O&M Operator has to ensure O&M of all R.O units installed for drinking purpose and ensure regular cleaning of toilets at different locations.

28. O&M Operator shall smoothly run fire dept., maintaining all necessary assets as per the statutory requirements and maintaining adequate manpower in each shift. The fire-fighting system will consist of water fire-fighting system, inert gas firefighting system, foam protection system, portable fire extinguishers and the fire alarm and detection system. The water fire-fighting system will consist of hydrant fire Firefighting pumps, spray firefighting pumps, water hydrant system and water spray system. The foam fire-fighting system will consist of foam proportional mixer & storage tank, foam generators, foam hydrant. Deluge valve system, Dust separation system and other detection system shall be the kept in auto mode all the time. Emergency handling equipment and vehicle must be maintained all the time.

29. O & M Operator Shall ensure 100% Automation of fire protection / detection & firefighting system and periodic checklist based inspection of firefighting assets.

30. O & M Operator to ensure 100 % compliance to work permit system as per Vedanta standard.

31. O&M Operator has to ensure compliance of Implementation of ISO 14001:2015, ISO 9001:2015, OHSAS 18001, ISO – 39001 (Road Traffic System), 5S and other management systems.

32. O&M Operator has to implement SAP EHS

33. O&M Operator has to establish library

34. O&M Operator has to conduct HSE induction, awareness and celebration of National Safety week, Fire safety, World Environment Day etc.

35. O&M Operator shall appoint the required HSE personnel based upon the statutory requirement and establish the HSE organisation.

36. O&M Operator has to implement HSE score card system and conduct meeting & reviews as per the statutory requirements.

37. O&M Operator has to conduct safety inspections, safety investigations etc., issue of required PPE's and maintain of stock of the same.

38. O&M Operator has to implement VSF by update SOP's, conduct regular internal audits, trainings, coordinating with external auditor, preparation of CAPA and closure of observations.

39. O&M Operator has to ensure awareness / training related HSE and SOP for safe operation of plant.

40. O&M operator has follow the latest amendments in statutory Act / Rule / Notifications / Guidelines.

## ANNEXURE – G - PRICE SCHEDULE

**Bidding Tables with Breakup & Backup**

| S.No | Heads | Cost(INR) |
|---|---|---|
| 1 | Mobilization Fee (one time) | |
| 2 | O&M Service fee for Year 1 | |
| 3 | O&M Service fee for Year 2 | |
| 4 | O&M Service fee for Year 3 | |
| 5 | O&M Service fee for Year 4 | |
| 6 | O&M Service fee for Year 5 | |
| 7 | De-mobilization fee | |

* IF the contract is renewed, then demobilization fee shall not be paid.

**Annexures to Bidding Heads**

i. Manning positions: Grade wise and utility wise
ii. Breakup of price as per below schedule

| Price Break Up | | |
|---|---|---|
| **SN.** | **Activity** | **Annual Fee (Rs. Cr)** |
| 1 | BTG | |
| 2 | CHP | |
| 3 | AHP | |
| 4 | BOP | |
| 5 | ECI | |
| 6 | Health, Safety and Fire | |
| 7 | Horticulture, Green Belt and Environment | |
| 8 | Guest House & allied facility management including Admin and transportation | |
| 9 | Security | |
| 10 | Others (Please specify) | |

**Documents to be submitted with bid: -**

i. Provide list of references of previous contracts handled and complete Customer List Handled or being handled
ii. Furnish the order copy of the latest order received on similar grounds
iii. ISO 9001, 14001, 18001 Certificates
iv. HSE Policy & past safety record—Fatal and LTIFR for previous three years
v. Annual Audited Report of last 3 years : P&L Statements and Balance Sheet
vi. List of available Tools, tackles and equipment(s) which can be immediately deployed for this plan.

**COMPLETENESS OF PRICING**

All rates, sums, charges and prices referred to in this Schedule:

i. are stated in Indian rupees (INR).
ii. are considered complete and fully inclusive in respect of the services being provided and no additional rates, sums, charges or prices shall be paid, except as expressly stated in the Agreement;
iii. shall remain fixed and firm and shall not be subject to amendment for any cause, except as expressly stated in the Agreement.

The cost of any item where the price is left blank shall be deemed included elsewhere.

**Taxes**

The prices and rates set out in this Schedule II (Compensation Schedule) are:

i. inclusive of all Indian direct taxes (including without limitation personnel taxes, withholding taxes and corporate taxes) now or hereafter levied or imposed on the Service Provider; and
ii. inclusive of all non-Indian taxes (whether direct or indirect) now or hereafter levied or imposed on the Service Provider; and
iii. Inclusive of all taxes/levies/duties as applicable except for Service Tax which shall be paid over and above the below mentioned charges as per applicable rates.

**Withholding Tax**

TDS shall be deducted as per the applicable rates under Income Tax Act and same shall be in Service Provider's account only.

## ANNEXURE - H - OWNER'S CLEARANCES

| Sl No | Clearance | Status |
|---|---|---|
| 1 | PUNJAB Govt. Clearance | Obtained. |
| 2 | PSPCL Clearance | Obtained. |
| 3 | Pollution Control Board | Obtained (Consent to Operate) |
| 4 | Water | Available |
| 5 | Coal | Arranged |
| 6 | Land Clearance | Not applicable |

**O&M OPERATORS CLEARANCE (The list is indicative not exhaustive)**

| SL NO | DESCRIPTION OF THE PERMITS | AUTHORITY | EXTENT OF CONTRACTOR'S RESPONSIBILITY | EXTENT OF OWNER'S RESPONSIBILITY |
|---|---|---|---|---|
| 1 | State / MoEF's Pollution Control Clearance | Pollution Control Board of Govt of Punjab and Ministry of Environment and Forestry | # Adherence to Pollution Control Norms stipulated norms by MoEF, and proving by Performance.<br># Providing the letters, drawings, documents, standards etc., as relevant for keeping up the Clearance from the Authority and obtaining the clearance as required. | Owner will forward the applications to the PCB(applications being filled by Contractor. |
| 2 | Boiler and Other Pressure parts including pipes and valves – Annual inspection, and other related permissions | The director of Boilers, Punjab | # Complete responsibility is with Contractor. Owner shall only provide letters addressed to Authority in the format (soft copy) requested by Contractor<br># Payment of Statutory fee to the Authority for reimbursement from Owner after producing documentary evidence. | # Provision of letters addressed to the Authority in the Capacity of the owner, in the requested format (soft copy) of the Contractor.<br># Reimbursement of the Statutory fee paid to the Contractor at actual, on production of the documentary evidence from the Authorities. |

| | | | | |
|---|---|---|---|---|
| 3 | Hydrogen and Fuel oil storage related permissions | Department of Explosives. | # Complete responsibility is with Contractor. Owner shall only provide letters addressed to Authority in the format (soft copy) requested by Contractor<br># Payment of Statutory fee to the Authority for reimbursement from Owner after producing documentary evidence | # Provision of letters addressed to the Authority in the Capacity of the owner, in the requested format (soft copy) of the Contractor.<br># Reimbursement of the Statutory fee paid to the Contractor at actual, on production of the documentary evidence from the Authorities. |
| 4 | Firefighting / Protection system - | Loss Prevention Association of India / Tariff Advisory Committee. | # Complete responsibility is with Contractor. Owner shall only provide letters addressed to Authority in the format (soft copy) requested by Contractor<br># Payment of Statutory fee to the Authority for reimbursement from Owner after producing documentary evidence | # Provision of letters addressed to the Authority in the Capacity of the owner, in the requested format (soft copy) of the Contractor.<br># Reimbursement of the Statutory fee paid to the Contractor at actual, on production of the documentary evidence from the Authorities. |
| 5 | Electrical plant and equipment, 400 KV installations, incl transformers, MV/LV switchgear #Inspection | The Chief Electrical Inspector to the Government. | # Complete responsibility is with Contractor. Owner shall only provide letters addressed to Authority in the format (soft copy) requested by Contractor<br># Payment of Statutory fee to the Authority for reimbursement from Owner after producing documentary evidence | # Provision of letters addressed to the Authority in the Capacity of the owner, in the requested format (soft copy) of the Contractor.<br>#Reimbursement of the Statutory fee paid to the Contractor at actual, on production of the documentary evidence from the Authorities. |
| 6 | License from labour Commissioner for labour pursuant to Section 7 of the Contract Labour (Regulation and Abolition) Act, 1970. | Labour Commissioner | # Complete responsibility is with Contractor. Owner shall only provide letters addressed to Authority in the format (soft copy) requested by Contractor | # Provision of letters addressed to the Authority in the Capacity of the owner, in the requested format (soft copy) of the Contractor. |

| | | | | |
|---|---|---|---|---|
| 7 | Registration of workers required pursuant to Section 2A of the Employees State Insurance Act 1948, or exemption to be claimed if other Group Insurance is taken (for contractor's personnel) | ESI | # Complete responsibility is with Contractor. Owner shall only provide letters addressed to Authority in the format (soft copy) requested by Contractor | # Provision of letters addressed to the Authority in the Capacity of the owner, in the requested format (soft copy) of the Contractor. |

## ANNEXURE I - REPORTS, INFORMATION AND BUDGETS

The O&M Operator shall provide to the Owner the following reports:

1. The O&M Operator shall provide to the Owner in the morning every day, a copy of a daily report for the previous day, including details of:

   1.1 output (gross and net exported) for that day, and daily fuel consumption [Coal, LDO] of the Plant (to the extent such information is available for such period) and auxiliary power consumed;

   1.2 consumption of raw water, distillate (dieTSPL - water) demineralized water, chemicals and other items;

   1.3 available capacity; outages.

   1.4 generation of fly ash and disposal of dry ash for economic use;

   1.5 accident and failure reporting

   1.6 efficiency report on boiler, ESP"s, turbine, DM plant, (gain to output ratio with respect to quality and quantity of water generated)

   1.7 safety record;

   1.8 stock details of Coal, LDO, major lubricants, raw water, distillate, chemicals, fly ash;

   1.9 shutdowns, trips, equipment under maintenance or break down;

   1.10 actual EPLF for the day, cumulative heat rate for the Month and year as of date;

   1.11 deemed generation for the day, cumulative heat rate for the Month and year as of date; a graph depicting the declared capacity and actual generated shall be drawn for the past 30 days inclusive of the present day; and

   1.12 non available equipment list, auto loop status of instrumentation, list of parameters which are in variance with rated parameters, manpower report category wise and environmental compliance report.

2. The O&M Operator shall prepare one Monthly report for the previous Month exclusively for the purpose of raising invoices by 12.00 hours, first of every Month and such report shall include the following details:

   2.1. deemed generation for the Month;
   2.2. net electrical output generated;
   2.3. gross electrical output.
   2.4. station heat rate
   2.5. auxiliary power consumption
   2.6. quantity of Coal and Secondary Oil received for the Month along with calorific value; status of spares and consumable & chemicals

3. Within five (5) days of the end of the Month to which it relates (the "Relevant Month"), the O&M Operator shall provide to the Owner a Monthly report (the "Monthly Report") which shall include but not be limited to the following:
   3.1. a review of operations for the Relevant Month (including fuel consumption, reliability, load factor, actual output, actual heat rate, Load factor, efficiency and outages);
   3.2. a review of the financial performance as against the approved budget
   3.3. (Annual Budget) for the O&M Operator and also include the Plant Plantion for the next Month; indicating deviations if any;
   3.4. to the extent reasonably available, identification of and reasons for any
   3.5. deviation from the Annual Operating Plan for such period or any other plans or forecasts in respect of the Relevant Month and any such deviations anticipated for the following two Months;
   3.6. identification of all major repairs or alterations made during the Relevant Month;
   3.7. all the daily reports to be consolidated so that a comprehensive report can be prepared;
   3.8. information relating to safety and the incidence of accidents at the Plant;
   3.9. training and turnover of staff;
   3.10. such information as the Owner may reasonably request to assess the level
   3.11. of O&M Operator Liquidated Damages and which relate to the performance of the
   3.12. O&M Operator's obligations since the first day of the Contract Year in which the
   3.13. Relevant Month falls;
   3.14. such information as the Owner may reasonably request in connection with
   3.15. compliance with all applicable Environmental Laws; and
   3.16. accident and incident reporting.
4. The O&M Operator shall also modify the above reports (described in 1 to 3) as may be required by the relevant Authority (e.g. CEA) and if required submit the report as per the relevant Authorities format.
5. Within 15 days of the end of each Contract Year to which it relates (the "Relevant Year"), the O&M Operator shall (i) provide to the Owner an annual report which shall include a report consolidated from the Monthly Report and (ii) shall prepare a comprehensive report (the "Annual Report") covering all aspects of the operation and maintenance of the Plant. In addition to this the O&M Operator shall at least provide the following:
   5.1. summary of the Relevant Year‟s report on maintenance;
   5.2. summary of operations for the Relevant Year including fuel consumption,
   5.3. reliability, load factor, actual output, actual heat rate, Load factor, efficiency and outages;
   5.4. review of performance against the applicable Annual Operating Plan and any other plans or forecasts;
   5.5. summary of usage of consumables (including chemicals and lubricants);
   5.6. summary of use of auxiliary services including power and water;
   5.7. summary on the status of all statutory and non-statutory compliances;
   5.8. major accident (safety record) and incident reporting;
   5.9. and also prepare and submit the Annual Report for the Plant in the format as desired and approved by the Owner; and other information as the Owner shall reasonably request the O&M Operator to provide.

6. As soon as practicable (but in any event not later than 24 hours) after the occurrence the O&M Operator shall provide to the Owner, a report of:

6.1 any Forced Outage;
6.2 any incidence of death or injury to any person on the Site or near miss
6.3 incident, if such person is driving a vehicle owned by the Owner or is performing services related to this Agreement, off the Site;
6.4 any event of circumstances which, in the opinion of the O&M Operator,
6.5 has had or is likely to have a material adverse effect on the Owner or the operation and maintenance of the [Plant] including without limitation, industrial disputes, material infringement of environmental or other law or material damage to the Plant;
6.6 the breach of any relevant environment limit; and any Emergency Event.

Under the above mentioned eventualities the O&M Operator, in consultation with the Owner, shall promptly notify the insurance company within 24 hours.

7. Report to be provided to the Owner:

The O&M Operator shall provide to the Owner the following reports:

7.1 Annual Report, which shall include:

i. Planted daily Coal and Secondary Fuel demand at the [Plant];
ii. maintenance programs which affect the daily Coal and Secondary Fuel demand;
iii. emergency or other non-scheduled maintenance plans which affect estimated planned daily consumption or the ability to receive or store Coal and Secondary Fuel ;
iv. other schedules, plans and other information which form a basis for the annual PlantPlanted Coal and Secondary Fuel demand;
v. maintenance programs for the Coal and Secondary Fuel facility; and
vi. report on the fuel availability along with the quality received and problems associated with Coal and Secondary Fuel supply to be highlighted.

This report shall be updated every Month. The O&M Operator shall provide to the Owner his requirements of the fuel ensuring Contract Year

7.2 Daily Report on Fuel, which shall include:

a. actual measured Coal and Secondary Fuel inventory level at the [ICHP]; and quality of the Coal and Secondary Fuel received at the [CHP];
b. previous day's Dispatch level and Coal and Secondary Fuel consumption; and
c. Emergency Event or other unscheduled maintenance plans which affect estimated planned daily consumption or the ability to receive or store Coal and Secondary Fuel at the [stockyard];

8. Operating Records and Reports

In addition to the above, the O&M Operator shall prepare and maintain operating and accounting logs, records and reports documenting the operation and maintenance of the

Plant including such of the same as are required by the Owner.

In addition, the O&M Operator shall prepare and maintain such logs, records and reports as are required to support and document the information submitted to the Owner in any Monthly Report or Annual Report and such logs, records and reports as may reasonably be requested by the Owner.

Such operating data shall include records of management, fuel meters and other Plant F

Such logs, records and reports shall utilize the [International System of Units (SI)]. Accounting data and records shall be in a level of detail reasonably acceptable to the Owner.

The O&M Operator shall also prepare reports and data required by any Directive (including any renewal or replacement of any Permit), including such reports and data related to the maintenance of Hazardous Materials at the Site, in a manner that complies with applicable Directives.

The O&M Operator shall also maintain current revisions of the drawings, specifications, lists, clarifications and other materials provided to the O&M Operator by the Owner or the EPC Contractor. All logs, records and reports described in this agreement shall be retained by O&M Operator and shall be turned over to the Owner at the expiration of the Term. Copies of any such reports that may be submitted to any Competent Authority by the O&M Operator shall be transmitted to the Owner for the Owner's approval, which approval shall not be unreasonably withheld, prior to the submission of the same to any Competent Authority and the O&M Operator shall provide such reports to the Owner not less than ten (10) days before they are due.

## ANNEXURE – J – PPA PROVISIONS

Articles / Clauses of the PPA between TSPL (Seller) and PSEB (PSPCL) (Procurer) dated 01.09.2008 shall be complied by the party to the extent of responsibility of operations and maintenance of the plant and the associated activity thereof:

### ARTICLE 5: CONSTRUCTION

**Seller's Construction Responsibilities**

The Seller shall be responsible for designing, constructing, erecting, commissioning, completing and testing the Power Station in accordance with the following, it being clearly understood that in the event of inconsistency between two or more of the following, the order of priority as between them shall be the order in which they are placed, with 'applicable law' being the first:

a) applicable Law;
b) the Grid Code;
c) the terms and conditions of this Agreement;
d) the Functional Specifications; and
e) Prudent Utility Practices

Notwithstanding anything to the contrary contained in this PPA, the Seller shall ensure that the technical parameters or equipment limits of the Project shall always be subject to the requirements as specified in points (a) to (e) above and under no event shall over-ride or contradict the provisions of this Agreement and shall not excuse the Seller from the performance of his obligations under this Agreement.

### ARTICLE 7: OPERATION AND MAINTENANCE

The Parties shall comply with the provisions of the applicable Law including, in particular, Grid Code as amended form 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 Unit when another Unit of the project is shut down or expected to be shut down except under Force Majeure or when the operation of Unit is not permissible due to technical considerations.

### ARTICLE 8: 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 one hundred per cent (100%) of the Contracted Capacity of the

commissioned units (excluding the unit(s) under planned outage for capital maintenance in consultation with the Regional Power Committee, if any) even for one continuous period of at least three (3) hours during any three continuous months, require the Seller to demonstrate a Unit's or (if all the Units have been Commissioned, the Power Station's) Tested Capacity by carrying out a further Performance Test (a **"Repeat Performance Test"**) in accordance with this Article 8.1. A Repeat Performance Test shall be carried out in accordance with Schedule 5, save that the test shall last twenty-four (24) hours instead of seventy two (72) hours. Provided that if the Tested Capacity after such test is less than one hundred percent (100%) of the Contracted Capacity as existing on the Effective Date or in case the Seller has exercised the option under Article 3.1.1A the Contracted Capacity as so finalized) of the Commissioned Units, the Seller shall also have a right to conduct not more than two (2) Repeat Performance Test within a period six (6) months, by giving a notice of not less than fifteen (15) 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 five (5) 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 seven (7) days' advance written notice of the time when a Repeat Performance Test of a Unit (or if all the Units have been Commissioned, of the Power Station's) is to begin. A Repeat Performance Test may not be scheduled for any period when the Unit to be tested is due to undergo a Scheduled Outage.

8.1.3 The Procurer and Seller shall jointly appoint the Independent Engineer to monitor the Repeat Performance Test and to certify the results in accordance with Article 8.2 of PPA.

8.1.4 If the Seller wishes to take any Unit, 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 Unit is returned to service following that Maintenance Outage. Provided however the Seller shall not schedule the Maintenance Outage of a Unit when another Unit of the project is shut down or expected to be shut down except under Force Majeure or when the operation of Unit is not permissible due to technical considerations.

8.1.5 The Procurer requiring the Repeat Performance Test, may , for reasonable cause, defer any Repeat Performance Test for up to fifteen (15) days from the date originally notified to the Seller in accordance with Article 8.1.2 of PPA if the Procurer notifies the Seller in writing at least one (1) 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 request of the Procurer 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 authorized 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 five (5) days of a Repeat Performance Test, the Seller shall provide the Procurer and the Independent Engineer with copies of the detailed test results.

8.1.9 Within one (1) Month of the date by which all the Units 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 Article 8.2 of PPA shall apply. A Power Station Performance Test shall be carried out in accordance with Article 1.1 of Schedule 5, save that the test shall last twenty-four (24) hours instead of seventy two (72) hours.

*8.2.* Derating

8.2.1 A Repeat Performance Test shall be concluded when the Procurer receives the Final Test Certificate of the Independent Engineer stating that the Repeat Performance Test has been carried out satisfactorily in accordance with Schedule 5 and certified the Unit's (or if all the Units have been commissioned), the Power Station's ) then current Tested Capacity as demonstrated by the results of the Repeat Performance Test.

8.2.2 (i) If a Unit's (or if all the Units 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 or in case the Seller has exercised the option under Article 3.1.1A the Contracted Capacity so finalized, the Seller shall not be permitted to declare the Available Capacity of the Unit (or if all the Units have been Commissioned, of the Power Station's) at a level greater than its Tested Capacity, in which case:

a) the Unit's (or if all the Units have been Commissioned, of the Power Station's ) Contracted Capacity shall be reduced to its most recent Tested Capacity and Quoted Capacity Charges shall be paid with respect to such reduced Contracted Capacity.

b) Further, the Quoted Non –Escalable Capacity Charge shall be reduced by the following:
Rs. 0.25/kwh x [1 – {(Tested Capacity of all Commissioned Units + Contracted Capacity at the Effective Date or in case the Seller has exercised the option under Article 3.1.1A the Contracted Capacity so finalized of all Units not Commissioned)/Contracted Capacity at the Effective Date of all Units or in case the

Seller has excercised the option under Article 3.1.1A of PPA the Contracted Capacity so finalized }];

c) the Availability Factor of the derated Unit (or if all the Units have been Commissioned, of the Power Station's) shall be calculated by reference to the reduced Contracted Capacity, and:

d) 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 Unit which has yet to be Commissioned);

(ii) The consequences mentioned in sub-Article (i) 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 six month period referred to in Article 8.1.1, whichever is earlier, the Tested Capacity is less than the Contracted Capacity as existing on the Effective Date or in case the Seller has exercised the option under Article 3.1.1A the Contracted Capacity so finalized, the consequences mentioned in Article 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 Article 8.1.1 of PPA, whichever is earlier

8.2.3 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 Schedule 5 of PPA, the Procurer shall reschedule a Repeat Performance Test as soon as reasonably practicable.

8.2.4 If a Unit's or if all the Units have been commissioned, of the Power Station's, Tested Capacity is found to be more than it's Contracted Capacity, the provisions of Article 6.3.5 of PPA shall apply mutatis mutandis.

*8.3. Availability*

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

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.

## ARTICLE 9: METERING AND ENERGY ACCOUNTING

### 9.1 Meters

For installation of Meters, Meter testing, Meter calibration and Meter reading and all matters incidental thereto, the Seller and the Procurer 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.

## ARTICLE 12 : FORCE MAJEURE

Definitions

In this Article 12 of PPA, the following terms shall have the following meanings:

Affected *Party*

An affected Party means the Procurer or the Seller whose performance has been affected by an event of Force Majeure.

An event of Force Majeure affecting the CTU/STU or any other agent of Procurer, which has affected the Interconnection Facilities, shall be deemed to be an event of Force Majeure affecting the Procurer.

Any event of Force Majeure affecting the performance of the Seller's contractors, shall be deemed to be an event of Force Majeure affecting Seller only if the Force Majeure event is affecting and resulting in:

a. late delivery of plant, machinery, equipment, materials, spare parts, Fuel, water or consumables for the Project; or
b. a delay in the performance of any of the Seller's contractors.

Similarly, any event of Force Majeure affecting the performance of the Procurer's contractor for the setting up or operating Interconnection Facilities shall be deemed to be an event of Force Majeure affecting Procurer only if the Force Majeure event is resulting in a delay in the Performance of Procurer's contractors.

*Force Majeure*

A 'Force Majeure' means any event or circumstance or combination of events and circumstances including those stated below that wholly or partly prevents or unavoidably delays an Affected Party in the performance of its obligations under this Agreement, but only if and to the extent that such events or circumstances are not within the reasonable control, directly or indirectly, of the Affected Party and could not have been avoided if the Affected Party had taken reasonable care or complied with Prudent Utility Practices:

**Natural Force Majeure Events:**

act of God, including, but not limited to lightning, drought, fire and explosion (to the extent originating from a source external to the Site), earthquake, volcanic eruption, landslide, flood, cyclone, typhoon, tornado, or exceptionally adverse weather conditions which are in excess of the statistical measures for the last hundred (100) years,

**Non-Natural Force Majeure Events:**

1. Direct Non - Natural Force Majeure Events

a) Nationalization or compulsory acquisition by any Indian Governmental Instrumentality of any material assets or rights of the Seller or the Seller's contractors; or

b) the unlawful, unreasonable or discriminatory revocation of, or refusal to renew, any Consent required by the Seller or any of the Seller's contractors to perform their obligations under the Project Documents or any unlawful, unreasonable or discriminatory refusal to grant any other consent required for the development/ operation of the Project. Provided that an appropriate court of law declares the revocation or refusal to be unlawful, unreasonable and discriminatory and strikes the same down.

c) any other unlawful, unreasonable or discriminatory action on the part of an Indian Government Instrumentality which is directed against the Project. Provided that an appropriate court of law declares the revocation or refusal to be unlawful, unreasonable and discriminatory and strikes the same down.

**Indirect Non - Natural Force Majeure Events**

1. any act of war (whether declared or undeclared), invasion, armed conflict or act of foreign enemy, blockade, embargo, revolution, riot, insurrection, terrorist or military action; or

2. Radioactive contamination or ionizing radiation originating from a source in India or resulting from another Indirect Non Natural Force Majeure Event excluding circumstances where the source or cause of contamination or radiation is brought or has been brought into or near the site by the Affected Party or those employed or engaged by the Affected Party.
3. Industry wide strikes and labor disturbances having a nationwide impact in India.

**Force Majeure Exclusions**

Force Majeure shall not include (i) any event or circumstance which is within the reasonable control of the Parties and (ii) the following conditions, except to the extent that they are consequences of an event of Force Majeure:

a. Unavailability, late delivery, or changes in cost of the plant, machinery, equipment, materials, spare parts, Fuel or consumables for the Project;

b. Delay in the performance of any contractor, sub-contractors or their agents excluding the conditions as mentioned in Article 12.2 of PPA;

c. Non-performance resulting from normal wear and tear typically experienced in power generation materials and equipment;

d. Strikes or labour disturbance at the facilities of the Affected Party;

e. Insufficiency of finances or funds or the agreement becoming onerous to perform; and

f. Non-performance caused by, or connected with, the Affected Party's:

   i) Negligent or intentional acts, errors or omissions;

   ii) Failure to comply with an Indian Law; or

   iii)Breach of, or default under this Agreement or any Project Documents.

**Notification of Force Majeure Event**

The Affected Party shall give notice to the other Party of any event of Force Majeure as soon as reasonably practicable, but not later than seven (7) days after the date on which such Party knew or should reasonably have known of the commencement of the event of Force Majeure. If an event of Force Majeure results in a breakdown of communications rendering it unreasonable to give notice within the applicable time limit specified herein, then the Party claiming Force Majeure shall give such notice as soon as reasonably practicable after reinstatement of communications, but not later than one (1) day after such reinstatement. Provided that such notice shall be a pre-condition to the Seller's entitlement to claim relief under this Agreement. Such notice shall include full particulars of the event of Force Majeure, its effects on the Party claiming relief and the remedial measures proposed. The Affected Party shall give the other Party regular (and not less than monthly) reports on the progress of those remedial measures and such other information as the other Party may reasonably request about the situation.

The Affected Party shall give notice to the other Party of (i) the cessation of the relevant event of Force Majeure; and (ii) the cessation of the effects of such event of Force Majeure on the performance of its rights or obligations under this Agreement, as soon as practicable after becoming aware of each of these cessations.

***Duty to perform and duty to mitigate***

To the extent not prevented by a Force Majeure event pursuant to Article 12.3 of PPA, the Affected Party shall continue to perform its obligations pursuant to this Agreement. The Affected Party shall use its reasonable efforts to mitigate the effect of any event of Force Majeure as soon as practicable.

**Available Relief for a Force Majeure Event**

Subject to this Article 12 of PPA:

a. no Party shall be in breach of its obligations pursuant to this Agreement to the extent that the performance of its obligations was prevented, hindered or delayed due to a Force Majeure Event;
b. every Party shall be entitled to claim relief in relation to a Force Majeure Event in regard to its obligations, including but not limited to those specified under Article 4.5 of PPA.
c. For the avoidance of doubt, it is clarified that no Tariff shall be paid by the Procurer for the part of Contracted Capacity affected by a Natural Force Majeure Event affecting the Seller, for the duration of such Natural Force Majeure Event. For the balance part of the Contracted Capacity, the Procurer shall pay the Tariff to the Seller, provided during such period of Natural Force Majeure Event, the balance part of the Power Station is declared to be Available for scheduling and dispatch as per ABT for supply of power by the Seller to the Procurer.
d. If the average Availability of the Power Station is reduced below sixty (60) percent for over two (2) consecutive months or for any non-consecutive period of four (4) months both within any continuous period of sixty (60) months, as a result of an Indirect Non Natural Force Majeure, then, with effect from the end of that period and for so long as the daily average Availability of the Power Station continues to be reduced below sixty (60) percent as a result of an Indirect Non Natural Force Majeure of any kind, the Procurer shall make payments for Debt Service, subject to a maximum of Capacity Charges based on Normative Availability, relatable to such Unit, which are due under the Financing Agreements and these amounts shall be paid from the date, being the later of a) the date of cessation of such Indirect Non Natural Force Majeure Event and b) the completion of sixty (60) days from the receipt of the Financing Agreements by the Procurer from the Seller, in the form of an increase in Capacity Charge. Provided such Capacity Charge increase shall be determined by Appropriate Commission on the basis of putting the Seller in the same economic position as the Seller would have been in case the Seller had been paid Debt Service in a situation where the Indirect Non Natural Force Majeure had not occurred.

e. Provided that the Procurer will have the above obligation to make payment for the Debt Service only (a) after the Unit(s) affected by such Indirect Non Natural Force Majeure Event has been Commissioned, and (b) only if in the absence of such Indirect Non Natural Force Majeure Event, the Availability of such Commissioned Unit(s) would have resulted in Capacity Charges equal to Debt Service.

f. If the average Availability of the Power Station is reduced below eighty (80) percent for over two (2) consecutive months or for any non-consecutive period of four (4) months both within any continuous period of sixty (60) months, as a result of a Direct Non Natural Force Majeure, then, with effect from the end of that period and for so long as the daily average Availability of the Power Station continues to be reduced below eighty (80) percent as a result of a Direct Non Natural Force Majeure of any kind, the Seller may elect in a written notice to the Procurer, to deem the Availability of the Power Station to be eighty (80) percent from the end of such period, regardless of its actual Available Capacity. In such a case, the Procurer shall be liable to make payment to the Seller of Capacity Charges calculated on such deemed Normative Availability, after the cessation of the effects of Direct Non Natural Force Majeure in the form of an increase in Capacity Charge. Provided such Capacity Charge increase shall be determined by Appropriate Commission on the basis of putting the Seller in the same economic position as the Seller would have been in case the Seller had been paid Capacity Charges in a situation where the Direct Non Natural Force Majeure had not occurred.

g. For so long as the Seller is claiming relief due to any Non Natural Force Majeure Event (or Natural Force Majeure Event affecting the Procurer) under this Agreement, the Procurer may from time to time on one (1) days notice inspect the Project and the Seller shall provide Procurer's personnel with access to the Project to carry out such inspections, subject to the Procurer's personnel complying with all reasonable safety precautions and standards. Provided further the Procurer shall be entitled at all times to request Repeat Performance Test, as per Article 8.1 of PPA, of the Unit(s) Commissioned earlier and now affected by Direct or Indirect Non Natural Force Majeure Event (or Natural Force Majeure Event affecting the Procurer), where such Testing is possible to be undertaken in spite of the Direct or Indirect Non Natural Force Majeure Event (or Natural Force Majeure Event affecting the Procurer), and the Independent Engineer accepts and issues a Final Test Certificate certifying such Unit(s) being capable of delivering the Contracted Capacity and being Available, had there been no such Direct or Indirect Non Natural Force Majeure Event (or Natural Force Majeure Event affecting the Procurer). In case, the Available Capacity as established by the said Repeat Performance Test (provided that for such Repeat Performance Test, the limitation imposed by Article 8.1.1 shall not apply) and Final Test Certificate issued by the Independent Engineer is less than the Available Capacity corresponding to which the Seller would have been paid Capacity Charges equal to Debt Service in case of Indirect Non Natural Force Majeure Event (or Natural Force Majeure Event affecting the Procurer), then the Procurer shall make pro-rata payment of Debt Service but only with respect to such reduced Availability. For the avoidance of doubt, if Debt Service would have been payable at an Availability of 60% and pursuant to a Repeat Performance Test it is established that the Availability would have been 40%, then Procurer shall make payment equal to Debt Service multiplied by 40% and divided by 60%. Similarly, the payments in case of Direct Non Natural Force Majeure Event (and Natural Force Majeure Event affecting the Procurer) shall also be adjusted pro-rata for reduction in Available Capacity.

h. In case of a Natural Force Majeure Event affecting the Procurer which adversely affects the performance obligations of the Seller under this Agreement, the provisions of sub-proviso (d) and (f) shall apply.

i. For the avoidance of doubt, it is specified that the charges payable under this Article 12 of PPA shall be paid by the Procurer.

**Additional Compensation and Procurer's Subrogation**

If the Seller is entitled, whether actually or contingently, to be compensated by any person other than the Procurer as a result of the occurrence of a Non Natural Force` Majeure Event (or Natural Force Majeure Event affecting the Procurer) for which it has received compensation from the Procurer pursuant to this Article 12 of PPA, including without limitation, payments made which payments would not have been made in the absence of Article 4.7.1 of PPA, the Procurer shall be fully subrogated to the Seller's rights against that person to the extent of the compensation paid by the Procurer to the Seller. Provided that in case the Seller has actually received compensation from the any person other than the Procurer as well as the Procurer as a result of the occurrence of a Non Natural Force` Majeure Event (or Natural Force Majeure Event affecting the Procurer), then the Seller shall forthwith refund the compensation received by it from the Procurer but only to the extent of the compensation received by the Seller from any person other than the Procurer.

**Ramp Rates**

All Units of the Power Station shall be capable of increasing or decreasing their output (generation level) by not less than one percent (1%) per minute. Such capability shall be demonstrated during the Unit load of more than 50%.

## ANNEXURE K - RESPONSIBILITY MATRIX / SCOPE

| Sl. No. | Description of work / Activity | Responsibility Matrix / Scope | | REMARK |
|---|---|---|---|---|
| | | OWNER | O&M | |
| 1 | Total Operation & Maintenance of the Plant | | □ | |
| 2 | Startup Power & Back-up power | □ | □ | Coordination with LDC shall be in the scope of O&M Operator & funds for payment of startup power bill shall be done by Owner. |
| 3 | All type of Fuel required for O&M | □ | □ | The procurement of primary & secondary fuel shall be in the Owner's scope.<br><br>The scope of O & M Contractor for coal rake and secondary fuel shall start from Sadda Singh Wala Railway Station & Plant gate respectively. |
| 4 | Primary Fuel Quality | □ | □ | Third Party for Primary Fuel quality certification shall be arranged by Owner. O&M Operator to arrange Coordination & witness of Quality process & results. |
| 5 | Secondary Fuel Quality & Quantity | | □ | O&M Operator Scope. |
| 5 | Water System | | □ | The complete operation and maintenance of the Raw Water System from the intake point i.e Jagga canal (including maintaining the reservoir) shall be in O&M Operator’s scope. |

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| | | | | Upstream coordination from source of water & with irrigation deptt shall be in the scope of O&M Operator. |
| 6 | Coal Availability at Plant | □ | □ | Managing entire coal value chain (Quality, quantity, logistics & handling at Coal Handling Plant) right from Sadda Singh wala Railway station to handing over of empty rakes back to Railways shall be in the scope of O&M Operator.<br>The wagons have to be unloaded within specified hours. If the unloading can't be done within the specified hours, than the applicable demurrages from railways shall be borne by O&M Operator. |
| 7 | Ash Handling | | □ | O&M Operator's responsibility to operate and maintain the complete Ash Handling system including all pipelines upto ash pond including Operation and maintenance of Ash Pond.<br>O&M Operator is responsible for 100% Ash Utilization & all necessary agreements shall be provided by Owner. |
| 8 | **Battery Limit for the following:** | | | OWNER shall furnish details of procedure / systems presently adopted & is in operation at Plant site. Procedure shall include battery limit for O&M against each disposal. |
| A | Sewage & Waste Discharge System | | □ | O&M Operator shall dispose the Plant sewage and plant waste discharge in mutually agreed location. |
| B | Waste from RO Water Disposal | | □ | Disposal as RO reject as per the design by O&M operator. |
| C | Waste from Cooling Tower & Boiler Blow Down | | □ | Operator's responsibility – System designed for handling this and O&M Operator has to operate and maintain the system. |
| D | Ash / Waste Disposal | | □ | Wet ash disposal system along with HCSD for total fly and bottom ash handling is available along with dry fly ash unloading system in to bulkers. O&M operator is |

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| | | | | responsible for maintaining wet disposal system availability.<br>However, if special arrangement is required due to non-availability of ash collection and disposal system, it will be arranged by O&M Operator and the cost will be borne by O&M operator. |
| F | Disposal of Solid Waste | | □ | O&M Operator shall dispose the Plant solid waste in a mutually agreed location. |
| G | Scrap Disposal | □ | □ | O&M Operator shall dispose the Scrap as per the contract finalized by the owner.<br>The project scrap is also lying in plant, O&M Operator to assess the same and transfer to scrap yard for further disposal |
| 9 | **Laboratories** | | | |
| A | Electrical Laboratory along with Calibrated Test Instruments & equipment | | □ | Lab equipment's (Electrical, instrumentation & chemical laboratory) usage, maintenance, repair, calibration and upkeep of the same shall be with O&M Operator. |
| B | Instrumentation Laboratory along with Calibrated Test Instruments & equipment | | □ | |
| C | Chemical Laboratory along with Calibrated Test Instruments & equipment | | □ | |
| 10 | Spare Parts which go in to the System / equipment as per OEM/Manual/O&M recommendation | □ | □ | Inventory management and storage and making timely indents will be with O&M Operator.<br>Creation of purchase requisition, vendor master, technical bid evaluation & technical negotiation and approval from owner shall be in the scope of O&M Operator.<br>Procurement shall be done by the Owner based on timely indents being raised by O&M operator |

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|---|---|---|---|---|
| | | | | O&M Operator shall also maintain the Store at Plant premises and manage inventories as per guidelines stipulated. |
| 11 | Space / Covered storage sheds for Material Management | □ | | Stores will be provided by Owner. |
| 12 | Stores Management / Material Management services | | □ | Full Store premises including weigh bridges O&M and handling & preservation of materials has to be maintained by O&M Operator. O&M Operator shall also ensure perpetual inventory verification and monthly Physical verification as per Owner/third party appointed by Owner. |
| 13 | Regular, Preventive, Breakdown maintenance | | □ | O&M Operator's responsibility |
| 14 | Annual Maintenance Contract with OEM's | | □ | O&M operator to identify the list of AMCs and provide to the owner within ninety (90) days from the Effective Date of contract. All AMCs has to be arranged and the cost to be borne by O & M operator's. |
| 15 | Annual shut-down & Overhauls | | □ | Refer to the detailed "Maintenance Responsibility Matrix". |
| 16 | Special Tools and Tackles | | □ | Special tools and tackles as provided by EPC/OEM shall be handed over to O&M Operator.<br>The upkeep and the responsibility to return those at the end of Contract in good working condition shall be with O&M Operator. |
| 17 | Use of EOT's Cranes | | □ | EOT as given by EPC shall be given to O&M Operator.<br>O&M Operator to provide operator & also to maintain the crane. |
| 18 | Use of Equipment Handling System | | □ | All handling equipment shall be with O&M Operator. In CHP 4 number of Dozers shall be provided by the owner. All other heavy equipment like Poclain, JCB etc. shall be with O&M Operator. |
| 19 | Manpower for O&M | | □ | O&M Operator's responsibility as per Agreement. |

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|---|---|---|---|---|
| 20 | Condition monitoring, Special jobs like online leak arrest, belt vulcanizing | | □ | O&M Operator's responsibility |
| 21 | Overhaul Cycle of Turbine and Generator | | | Refer to Maintenance Responsibility Matrix |
| 22 | Evaluation of Plant Operation and furnishing recommendations on cost effective ways to improve the Plant Performance. | □ | □ | O&M Operator's responsibility.<br>But implementation shall be with Owner. |
| 23 | Power evacuation | | □ | 400KV Switch yard within the Plant, grid co-ordination, all coordination with LDC & finalization of SEA is in the scope of O & M Contractor. |
| 24 | Fire Fighting Equipment / Fire Tender | □ | □ | Fire Tender as available shall be handed over to the O&M Operator.<br>However supply of refilling agents / other consumables, hoses, fire extinguishers shall be in the scope of O&M Operator. |
| 25 | Third Party Audit | □ | □ | All third party Audits including but not limited to Inventory management, physical verification, VSAP, safety etc as per the owner policies has to be done by O&M Operator. Third party surveyor will be engaged by owner, as per owner's discretion and rest all works has to be organized by O&M Operator. |
| 26 | ISO 9001, ISO14001,<br>OHSAS 18000, 39001, 50001 Certification and any further requirement | □ | □ | O&M Operator shall involve themselves with the consultant engaged by the Owner for ISO & OHSAS Certification and will meet all requirement asked by the consultant. All the work required for this will be carried out by O&M Operator under the guidance and direction of the consultant appointed by Owner in the required time frame Owner's consultant will also work in close co-ordination with O&M Operator. |
| 27 | Plant security & traffic Management | | □ | |

| | | | | |
|---|---|---|---|---|
| 28 | Medical/OHC Facilities | □ | □ | Medical/OHC facility, as available in the factory premises will be provided by Owner.<br>However the required First Aid has to be kept ready in Plant area by O&M Operator. |
| 29 | Safety, Security & road traffic management at TSPL premises | | □ | O&M operator shall arrange security/safety/road traffic management of the entire TSPL premises |
| 30 | Painting & Maintenance of all equipment / building /Road/ structures etc | □ | □ | Touch up painting and painting due to any operation and maintenance activity including supply of paints by O&M Operator.<br>Maintenance, up-keeping and painting of buildings/offices/Road/Structures shall be done by O&M operator.<br>Paint shall be provided by Owner as per requirement agreed with O&M Operator. |
| 31 | Plant horticulture, landscaping & green belt | | □ | O&M Operator shall maintained Plant horticulture, landscaping & green belt |
| 32 | Plant Upkeep Services | | □ | O&M operator shall arrange Housekeeping/sanitation/road & drain cleaning services of the entire TSPL premises |
| 33 | Maintenance of internal roads, buildings, boundary wall & civil maintenance works | □ | □ | Repair & day to day maintenance of offices, storage sheds, laboratories, internal roads, buildings, boundary wall and workshop will be by O&M Operator. Any new construction of Road/buildings will be done by O&M operator at OWNER's cost as an additional services. |
| 34 | Insurance for the Plant & Machinery as applicable | □ | □ | Owner will obtain required plant and machinery insurance and will also pay for the renewals.<br>All required paper works for the insurance will be made by O&M OPERATOR. |
| 35 | Arrangement of Insurance covers & claim management | □ | □ | All support & coordination for the insurance will be made by O&M OPERATOR. |

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| 36 | Insurance- Pertaining to O&M Contractor | | □ | Workman Compensation, Group Insurance policies and any other requirement as per the local laws for the personnel engaged by O&M Operator shall be responsibility of O&M Operator |
| 37 | Suitable Office accommodation & furniture including storage facilities, rest room & office equipment facilities | □ | □ | All the available facility/office space will be provided by owner however furnishing & other requirements shall be O&M Operator scope. |
| 38 | Telephone, Fax & LAN/IP facilities at Office | □ | □ | All the available facility will be provided by owner however other requirements/maintenance shall be O&M Operator scope. |
| 39 | Residential Accommodation | | □ | O&M Operator's responsibility |
| 40 | Statutory Compliances Environmental aspects Boiler Inspectorate Electrical Inspectorate Factory inspectorate / Licensing and Permits from local & central authorities | □ | □ | Maintaining all the compliances & coordination with relevant regulatory & statutory Authorities shall be in the scope of O&M Operator, however Owner will support as per requirement for authorization & issuing the required documents. |

**Maintenance Responsibility Matrix**

| Sr No | Activity | OEM | | Work supervision | | Consumables, T&P, manpower | | Spares | |
|---|---|---|---|---|---|---|---|---|---|
| | | Cost | Arranged by | Cost | Arranged by | Cost | Arranged by | Cost | Arranged by |
| 1 | Annual Overhauling | O&M | O&M | O&M | O&M | O&M | O&M | O | O&M |
| 2 | Breakdown/corrective maintenance | Insurance | O&M | O&M | O&M | O&M | O&M | O | O&M |
| 3 | Preventive Maintenance | NA | NA | O&M | O&M | O&M | O&M | O | O&M |
| 4 | Routine Maintenance | NA | NA | O&M | O&M | O&M | O&M | O | O&M |

A P E

# ANNEXURE L - STANDARD TERMS AND CONDITIONS

## 1. DEFINITIONS

1.1 In the Agreement, the following words and expressions shall, unless the context otherwise requires, have the following meanings:

"**Affiliate**" shall mean with respect to any person, any other person that, directly or indirectly, controls, is controlled by or is under common control of such specified person. For the purposes of this definition, "control" means the direct or indirect beneficial ownership of more than fifty percent (50%) of the issued share capital, stock or other participating interest or the legal power to direct or cause the direction of the general management of the company, partnership or other person in question, and "controlled" shall be construed accordingly;

**"Agreement"** shall mean the Agreement between the Company and the Service Provider to which this Schedule is attached.

**"Purchase Order"** shall mean the document recording the specific Services to be carried out under this Agreement, from time to time.

**"Fees"** shall mean the prices and/or rates payable by the Company in respect of the Services and/or as specified in the relevant Purchase Order.

1.2 Unless otherwise stated, any and all references in the Agreement to Clauses are references to the Clauses of the Agreement.

1.3 The headings in the Agreement are used for convenience only and shall not govern or affect the interpretation of the Agreement.

1.4 Words denoting the singular shall include the plural and vice versa, where the context requires.

1.5 Except as expressly identified, any reference to statute, statutory provision or statutory instrument shall include any re-enactment or amendment thereof for the time being in force.

1.6 Unless expressly stated otherwise, all references to days, weeks, months and years shall mean calendar days, weeks, months and years.

## 2. SCOPE OF CONTRACT

2.1 The terms and conditions of the Agreement shall apply from the Effective Date and shall remain valid for the Term unless this Agreement is terminated earlier by the Company in accordance with Clause 10 below (Standard Terms and Conditions).

2.2 Subject to the provisions of this Agreement, the Parties agree that upon request of the Company in terms hereof, the Service Provider shall perform the Services at such locations and for such periods as may be agreed with the Company.

2.3 From time to time, the Company may issue a Purchase Order to the Service Provider. In such case, the terms and conditions of this Agreement shall apply to each such Purchase Order as if repeated in total.

2.4 The Service Provider shall commence the Services on the scheduled commencement date stated in the Purchase Order and shall continue such Services for the duration of the Purchase Order. Each Purchase Order is subject to agreement on a case by case basis.

## 3. SERVICES

3.1 The Service Provider shall perform the Services with all due skill, care and diligence in a safe, competent and timely

manner and in accordance with the requirements of the Agreement and/or the relevant Purchase Order.

3.2 Except to the extent that it may be legally or physically impossible, the Service Provider shall comply with the Company's instructions and directions in all matters relating to the Services consistent with the provisions hereunder.

3.3 The Service Provider shall agree with the Company in the relevant Purchase Order from time to time as regards the personnel who will perform the Services and shall:

(a) only provide such personnel who possess appropriate experience, skills and qualifications necessary for the Services to be performed in accordance with this Agreement;

(b) not remove or replace such personnel without the prior written consent of the Company (not to be unreasonably withheld); and

(c) nominate a senior manager or director of the Service Provider to have overall responsibility for the provision of the Services in terms of the relevant Purchase Order, which person shall attend any meetings with the Company on reasonable prior notice.

3.4 The Company shall be entitled to request the Service Provider to replace any of its personnel providing the Services, where in the Company's reasonable opinion such person is incapable and or unsuitable for performing the Services required by this Agreement. The Service Provider shall promptly replace such person at no additional cost to the Company.

3.5 Without prejudice to any other rights of the Company under the Agreement or at law, if the Service Provider fails to perform the Services in accordance with the provisions of this Agreement, the Company may use alternative means to perform the Services and the Service Provider shall be liable for any additional cost incurred by the Company in using such alternate means.

## 4. FEES

4.1 The Company shall pay for the Services performed in accordance with the prices as per Attachment 2 to Schedule I and/or rates specified in the relevant Purchase Order.

4.2 In case of contingency assignments, the agreed fees for such onetime Services shall be payable on completion of the relevant assignment as per the Purchase Order.

## 5. SERVICE PROVIDER'S GENERAL OBLIGATIONS

5.1 The Service Provider shall, and the Service Provider shall ensure that its employees and representatives shall, in performing its obligations under this Agreement, comply in all respects with all relevant laws, statutes, regulations and orders for the time being in force.

5.2 Where any of the Service Provider's employees or representatives is present at any of the Company's premises for the purposes of this Agreement, the Service Provider shall at all times remain responsible for the conduct and safety of such employee or representative.

5.3 The Service Provider shall not, in performing its obligations under this Agreement, hold itself out or permit any person to hold it out as being authorised to bind the Company in any way and will not commit any act which might reasonably create the impression that it is so authorised.

5.4 The Service Provider shall ensure that it has in place and maintains in place for the duration of this Agreement sufficient insurance to comply with all applicable laws and to cover its potential liabilities under this Agreement and shall provide evidence of such insurances to the Company on request.

5.5 The Service Provider may not subcontract any of its obligations under this Agreement without the prior written consent of the Company. The Service Provider shall not be relieved from any of its obligations or liabilities under the Agreement by virtue of any subcontract and the Service Provider shall be responsible for all Services, acts, defaults or omissions of its subcontractors (and its or their employees and consultants) as though they were the services, acts, defaults or omissions of the Service Provider.

5.6 In performing the Services, the Service Provider shall:

(a) give preference to the purchase and use of goods manufactured, produced or supplied in India provided that such goods are available on terms equal or better than imported goods with respect to the timing of delivery, quality, quantity required, price and other terms;

(b) subject to Clause 5.5, employ Indian subcontractors having the required skills or expertise to the maximum extent possible insofar as their services are available on comparable standards with those obtained elsewhere and at competitive prices and on competitive terms, provided that where no such sub-Contractors are available, preference shall be given to non-Indian subcontractors who utilise Indian goods to the maximum extent possible, subject to the proviso in Clause 5.6 (a) above; and

(c) subject to Clause 5.5, co-operate with and assist Indian companies as subcontractors to enable them to develop skills and technology to service the petroleum industry.

5.7 The Service Provider shall maintain proper and accurate records in relation to the Services and shall provide copies of the same to the Company on request. The Company (or its appointed representative) shall have the right to audit the relevant books and accounts of the Service Provider in relation to any reimbursable charges paid for by the Company under this Agreement. Such audit right shall survive for a period of 2 (two) years following the expiry or termination of the Agreement. Any incorrect payments identified by such audit shall be adjusted between the Parties as appropriate.

## 6. THIRD PARTY CLAIMS AND LIMITATION OF LIABILITY

6.1 The Service Provider shall be liable for and shall defend, indemnify and hold the Company harmless from and against any and all claims, liabilities, costs, damages and expenses (including court costs and legal fees) in connection with any claim made by any third party (including, but not limited to, any claim made by any governmental or statutory authority) against the Company arising out of or in connection with the performance by the Service Provider of its obligations under this Agreement.

6.2 Notwithstanding anything to the contrary in this Agreement, in no event shall either Party be liable to the other, whether arising under Agreement, tort (including negligence), strict liability or otherwise, for any indirect, consequential, special, punitive, exemplary or incidental loss or damages of any nature arising at any time from any cause whatsoever.

## 7. VARIATIONS

7.1 At any time during this Agreement, the Company may request the Service Provider to vary, amend or otherwise alter the Services (a "Variation Request").

7.2 Upon the receipt of a request from the Company pursuant to Clause 7.1, the Service Provider shall, within 7 days, notify the Company of the effect of the Variation Request on the Fees and/or other terms of the relevant Order.

7.3 If following receipt of the Service Provider's response pursuant to Clause 7.2,

the Parties are in agreement on the Variation Request and the adjustments to be made to the relevant Purchase Order, the Parties shall execute a variation order (a "Variation Order") to reflect such agreement.

7.4 The Services shall not be varied, amended or otherwise altered and/or the Fees shall not be adjusted until such time as a Variation Order is executed by both Parties.

## 8. PAYMENT

8.1 In addition to any requirements set out in the relevant Purchase Order, each invoice shall:

(a) be in duplicate;
(b) bear the Contract Number stated on the cover sheet to the Agreement;
(c) state the name, e-mail address, mobile telephone number of the Company's Representative; and
(d) be accompanied by supporting evidence and itemised in accordance with the Company's requirements.

Specifically, the Service Provider shall submit the following information/ documents to the Company:

(i) Copy of registration certificates under Indian tax/other laws including but not limited to Service Tax, Excise, import export code etc., as applicable.
(ii) Copy of PAN.

Invoices to the Company shall be sent to the address set out in the Agreement. Service Provider must ensure that all invoices for services performed or goods delivered are submitted to the Company within 90 days.

8.2 The Company shall make payment of a correct invoice within 45 days of receipt to the Service Provider's nominated bank account. Any invoice not complying with the provisions of this Agreement will be returned by the Company and the Service Provider shall submit a rectifying invoice.

8.3 The Company may dispute any amount on an invoice and withhold the disputed amount provided that:

(a) the Company makes payment of any undisputed portion of the invoice and notifies the Service Provider of the disputed amount within 45 days of receipt of the relevant invoice;

(b) if the dispute is resolved in favour of the Service Provider, the Company shall pay the disputed amount within fifteen (15) days of the date of the resolution of the dispute or forty-five (45) days of receipt of the invoice, whichever is later.

If the dispute is resolved in favour of the Company, the Service Provider shall forthwith issue a credit note for the disputed amount.

8.4 The Company shall be entitled to set-off / adjust / deduct from any invoice under this Agreement, any payment due from the Service Provider to the Company or any of its Affiliates.

## 9. TAXES

### 9.1 Definitions

For the purposes of this Clause 9:

(a) "Tax" or "Taxes" means taxes, levies, duties, fees, charges and contributions as amended from time to time and any interest or penalties thereon;
(b) "Government Authority" or "Government Authorities" means any local or national government or authority of any country, competent to levy any Tax.

### 9.2 Person Responsible for payment of taxes

Except as may be expressly set out in this Agreement, the Service Provider shall be responsible for:

(a) the payment of all Taxes now or hereafter levied or imposed on the Service Provider or its subcontractors or on the personnel of the Service Provider or its subcontractors by any Government Authority in respect of any wages, salaries and other remuneration paid directly or indirectly to persons engaged or employed by the Service Provider or its subcontractors (hereinafter referred to as "Personal Income tax");
(b) the payment of all Taxes now or hereafter levied or imposed by any Government Authority on the actual/assumed profits and gains made by the Service Provider or its subcontractors (hereinafter referred to as "Corporate Income tax");
(c) the payment of all Taxes now or hereafter levied or imposed by any Government Authority on the services, if any, provided to the Company by the Service Provider or its subcontractors (hereinafter referred to as "Service tax");
(d) the payment of all Taxes now or hereafter levied or imposed by any Government Authority on the goods, if any, sold to the Company by the Service Provider or its subcontractors (hereinafter referred to as "Sales tax/VAT");
(e) the payment of all Taxes now or hereafter levied or imposed by any Government Authority on the goods, if any, manufactured by the Service Provider or its subcontractors for sale to the Company (hereinafter referred to as "Excise Duty"); and
(f) the payment of any other Taxes now or hereafter levied or imposed by any Government Authority on the Service Provider or its subcontractors as a result of the performance of this Agreement.

### 9.3 Withholding taxes and Withholding certificates

9.3.1 The Company shall, at the time of its payments due to the Service Provider, withhold the necessary taxes at such rate as is required by any Government Authority, unless and to the extent that the Service Provider shall produce to the Company any certificate issued by a Government Authority (having authority to issue such certificate) entitling the Service Provider to receive the payments under the Agreement for a prescribed period without deduction of any tax or deduction at a lower rate.

9.3.2 The Company shall provide the necessary withholding tax certificates to the Service Provider within the time stipulated by the relevant law to enable the Service Provider to file the same with the Government Authority as a proof of payment of such taxes.

### 9.4 Person Responsible for filing of returns / information to Government Authorities

9.4.1 The Service Provider shall be responsible for filing all necessary Tax returns (including, without limitation, returns for Corporate Income tax, Personal Income tax, Service tax, Sales tax and Excise Duty) with the relevant Government Authorities in accordance with all applicable statutory requirements and shall be responsible for providing all information requested by such Government Authorities.

9.4.2 The Service Provider shall also ensure that its sub-Contractors file such returns as stipulated by the relevant Government Authorities and furnish such information as requested for by the relevant Government Authorities.

9.4.3 The Company, with respect to the tax withheld from the Service Provider in accordance with Clause 9.3 (Withholding Tax and Withholding Tax Certificates), shall be responsible for filing the withholding tax returns with the relevant Government Authorities in accordance with applicable statutory requirements.

### 9.5 Company's rights, if treated as representative assessee by Government Authorities

In certain situations, a Government Authority may treat the Company as the representative assessee of the Service Provider and/or its subContractors and recover the Taxes due to the Government Authority by the Service Provider or its

sub-contractors from the Company. In such situations, the Company shall have the following rights:

(a) The Company shall be entitled to recover from the Service Provider, the Taxes paid on behalf of the Service Provider or its sub-contractors (together with any costs and expenses incurred by the Company in connection therewith) or to retain the same out of any amounts to be paid to the Service Provider or its sub-contractors that may be in its possession (whether due under this Agreement or otherwise) and shall pay only the balance, if any, to the Service Provider; and

(b) If the Company is required to furnish any details or documents in such capacity, the Company shall request the details or documents to be furnished to it by the Service Provider and the Service Provider shall immediately furnish the same to the Company. If the Service Provider fails to comply with the foregoing, any penalty/interest levied on the Company for non-filing or late filing of details or documents in this regard shall be recoverable from the Service Provider.

**9.6 Indemnity**

The Service Provider shall defend, indemnify and hold the Company harmless from and against any and all claims, liabilities, costs, damages and expenses (including court costs and legal fees) in connection with any Taxes which may be levied or imposed on the Service Provider or its sub-contractors by any Government Authority arising out of or in connection with the performance of this Agreement.

The Service Provider shall be liable for and shall defend, indemnify and hold the Company harmless from and against any Claim in connection with any infringement (whether actual or alleged) of any patent or other intellectual property right arising out of or in connection with the performance of this Agreement by the Service Provider.

**9.7 Changes in Law**

If, after the date of execution of this Agreement, there is any change in law which results in a change in the rate of any Tax included in the Service Provider's prices or rates or the introduction of a new Tax and such change results in an increase or decrease in the cost to the Service Provider of performing this Agreement then the Parties shall agree to a revision in pricing to reflect such change provided that:

(a) the Party requesting such revision shall promptly (and in any case prior to submission of the Service Provider's final invoice under this Agreement) notify the other Party that such change in law has arisen; and
(b) the Party requesting such revision shall provide the other Party with documentary proof of such change in cost to the reasonable satisfaction of the other Party; and
(c) the provisions of this Clause 9.7 shall not apply to changes in Personal Income tax or Corporate Income tax or to changes in non-Indian Taxes.

**10. TERMINATION**

10.1 Either Party may, at any time and without cause, terminate all or part of this Agreement by giving no less than [30] days' prior written notice to the other party. Provided that, if any Purchase Order has already been initiated and the work is in progress, then the Company only shall have the right to cancel/ terminate any Work under the relevant Purchase Order as specified in such Purchase Order without cause and with immediate effect.

10.2 In addition, the Company may terminate all or part of this Agreement with immediate effect by written notice to the Service Provider if one of the following circumstances occurs:

(a) if the Service Provider breaches any provision of this Agreement, provided that where remediable, the Company has notified the Service

Provider of such breach and the Service Provider has upon receipt of such notice, failed to immediately and thereafter continuously proceed to remedy such breach to the Company's reasonable satisfaction; or

(b) if the Service Provider becomes insolvent or bankrupt or makes a composition or arrangements with its creditors; or

(c) if the Service Provider is wound up or a resolution for its winding up is made (other than for the purposes of an amalgamation or reconstruction whilst solvent); or

(d) if the Service Provider has a liquidator, provisional liquidator, receiver, administrator or an administrative receiver or manager of its business or undertaking appointed; or

(e) if the force majeure under Clause 14 continues for more than thirty (30) days.

10.3 In the event of cancelation/ termination of all or part of this Agreement for any reason, the Company's sole liability to the Service Provider in respect of such cancelation/ termination shall be to make payment of the Fees properly due under this Agreement up to the date of termination.

10.4 The expiry or termination of this Agreement shall be without prejudice to the rights and obligations of the Parties up to and including the date of expiry or termination and shall not affect or prejudice any term of this Agreement that is expressly or by implication provided to come into effect on, or continue in force after, such expiry or termination.

## 11. CONFIDENTIALITY

11.1 The Company and the Service Provider shall keep any information which either Party learns about or receives from the other pursuant to this Agreement in strict confidence and will not disclose the same to any third party without the prior written consent of the other Party. The foregoing restriction shall not apply in respect of information which the Company requires to disclose for the purpose of performing Services or which was in the possession of the disclosing party prior to this Agreement or which is required to be disclosed by any law, rule or regulation of any governmental agency or court order. The provisions of this Clause shall survive the expiry of termination of the Agreement for a period of 3 years.

11.2 The Service Provider shall not disclose such Information(s) to any potential Subcontractors until such time and in manner agreed by Company in writing. The decision of the Company will be final and binding on the Service Provider in this regard.

11.3 The Service Provider shall use best endeavours to prevent the authorized disclosure of the all information hereunder. Where any information is required to be disclosed under Clause 11.1, the Service Provider shall give prompt notice to the Company and shall use its best commercial endeavours to limit the extent of any such disclosure.

## 12. NOTICES

12.1 Any notice or other communication required or given under this Agreement shall be delivered in writing either by hand or by courier, registered mail with acknowledgment due, or fax to the address of the relevant Party set out in the Agreement (or such other address as may be notified by the relevant Party from time to time).

12.2 If a notice is delivered by hand or courier during normal business hours of the intended recipient it shall be deemed to have been received at the time of delivery otherwise on the next business day of the recipient. A notice sent by facsimile shall be deemed to have been received at the

time when the sender's facsimile machine acknowledges transmission provided however that if the time of acknowledgement of transmission is after 5.00pm on a business day of the recipient it shall be deemed to have been received on the next business day of the recipient.

12.3 All notices or other communications between the Parties shall be in the English language.

## 13. GENERAL LEGAL PROVISIONS

13.1 The Company shall be entitled to assign this Agreement to an affiliate/subsidiary or on giving written notice to the Service Provider. Save as aforesaid, the Service Provider shall not be entitled to assign this Agreement or any part or any benefit or interest in or under it without the prior written approval of the Company which the Company may at its sole discretion accept or refuse.

13.2 This Agreement shall not be amended or modified except by mutual agreement in writing between the Parties.

13.3 This Agreement and the all Schedules and Attachments annexed hereto contains the whole agreement between the Parties relating to the subject matter of this Agreement, and supersedes any previous understandings, commitments, agreements or representations in respect of the subject matter.

13.4 No delay or failure on the part of either Party to enforce from time to time all or any part of the terms and conditions of this Agreement shall be interpreted as a waiver of such terms and conditions.

13.5 Nothing in this Agreement shall, or shall be deemed to, create an agency, a partnership or a relationship of employer and employee between the Parties. For the avoidance of doubt, nothing in this Agreement shall prevent or restrict the Company from entering into parallel Agreements with other parties for services similar or related to the Services.

13.6 Unless otherwise specifically stated, both the Company and the Service Provider shall retain all rights and remedies, both under the Agreement and at law, which either may have against the other.

13.7 Each Party represents and warrants to the other that (i) it has been duly registered and organized and is a validly existing legal entity under the laws of the jurisdiction of its incorporation and that it has full power, authority and capacity to enter into and to carry out its obligations under the Agreement and (ii) by performing the Services it will not be in breach of any other Agreement, agreement, license or permit or in violation of any law and (iii) it shall at all times act in accordance with applicable laws and regulations.

13.8 The Service Provider shall comply with all safety instructions of the Company consistent with the provisions of the Agreement including, without limitation, the safety instructions of any of the Company's other Service Providers. Such instructions shall, if the Service Provider so requires, be confirmed in writing by the Company's Representative, so far as practicable.

13.9 The Service Provider shall not be entitled, without the written consent of Company, to make any news release or public announcement concerning the subject matter of the Agreement or to refer to the Company, use its name or logo, in print or electronic forms for marketing or reference purposes.

13.10 If any provision of this Agreement is prohibited, invalid or unenforceable in any jurisdiction, that provision will, as to that jurisdiction, be ineffective to the extent of the prohibition, invalidity or unenforceability without invalidating the remaining provisions of this Agreement or affecting the validity or enforceability of that provision in any other jurisdiction, unless it materially alters the nature or material terms of this Agreement.

13.11 The provisions of this Agreement are solely for the benefit of the Parties. No

other person are intended to have, nor will have, any rights whatsoever, under this Agreement, whether for injury, loss or damage to person(s) or property or for economic loss.

13.12 This Agreement may be executed in one or more counterparts, each of which will be deemed to be an original copy of this Agreement and all of which, when taken together, will constitute one and the same instrument.

## 14. FORCE MAJEURE

14.1 Neither the Company nor the Service Provider shall be responsible for any failure to fulfil any term or condition of the Agreement if and to the extent that fulfilment has been delayed or temporarily prevented by a force majeure occurrence such as any (a) Act of God, (b) fire, flood, earthquake, (c) war, riot, insurrection and civil commotion, mobilization or military, call up of a comparable scope, which has been notified in accordance with this Clause 14 and which is beyond the reasonable commercial control and without the fault or negligence of the party affected and which, by the exercise of reasonable diligence, the said party is unable to provide against.

14.2 In the event of a force majeure occurrence, the party that is or may be delayed in performing the Agreement shall notify the other party without delay giving the full particulars thereof and shall use reasonable endeavours to remedy the situation without delay.

14.3 Save as otherwise expressly provided in the Agreement, no payments of whatever nature shall be made in respect of a force majeure occurrence.

14.4 Following notification of a force majeure occurrence in accordance with Clause 14.2, the Parties shall meet without delay with a view to agreeing a mutually acceptable course of action to minimise any effects of such occurrence.

## 15. BUSINESS ETHICS

15.1 The Service Provider shall declare any conflicts of interest with the Company including relationship or financial interest of any nature whatsoever with employees, managers, other suppliers, vendors or stakeholders of the Company.

15.2 The Service Provider shall not use the services of any of the employees of the Company, directly or indirectly or enter into any sort of monetary transaction with the employees of the Company. The Service Provider undertakes that he has not given, offered or promised to give directly or indirectly any bribes, commission, gift, consideration, reward, or inducement to any of the employees of the Company or their agent or relatives for showing or agreeing to show favor or disfavor to any person in relation to this Agreement or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of the aforesaid undertaking, by the Service Provider, or his partners, agent or servant or any one authorized by him or acting on his behalf. The Service Provider undertakes that in the event of use of any corrupt practices by the Service Provider, the Company shall be entitled to terminate the Agreement forthwith and recover from the Service Provider, the amount of any loss arising from such termination. A decision of the Company or his nominee to this effect that a breach of the undertaking had been committed shall be final and binding on the Service Provider.

15.3 If at any time during execution or performance of this Agreement the Service Provider if faced with any undue demand, request for gratification or favor from any employee of the Company or a person connection with such employee, the Service Provider must report the same immediately at tspl.whistleblower@vedanta.co.in.

15.4 The Service Provider agrees to comply with the provisions of the Company's Code of Conduct including the Modern Slavery Act and in case of breach thereof, the same shall be treated as a breach of this Agreement.

15.5 The Service Provider shall comply with the Anti-Bribery and Corruption (AB&C) requirements as applicable to them.

15.6 The Company shall have a right to initiate "audit proceedings" against the Service Provider to verify compliance with AB&C requirements. Such audit may be carried out by Company or by a reputed agency to be appointed by Company at the sole discretion of Company. The Service Provider shall extend full cooperation for smooth completion of the audit mentioned herein.

15.7 Notwithstanding anything in this agreement, Company shall have right to terminate the Agreement forthwith in case, it is found that the Service Provider has failed to comply with AB&C requirements.

15.8 The Service Provider may submit/report 'Complaints' pertaining to any violation to the Company's ethical business practices as specified in the Company's Code of Conduct Policy.

External stakeholders such as vendors, customers, business partners etc. have the opportunity to submit 'Complaints'; however, the Company is not obligated to keep 'Complaints' from non-employees confidential or to maintain the anonymity of non-employees. We encourage individuals sending 'Complaints'/raising of any matter to identify themselves s instead of sending anonymous 'Complaints' as it will assist in the effective complaint review process.

Post review, if the complaint is found to be have been made with malafide intention, stringent action will be taken against the complainant. We encourage reporting genuine 'Complaints' and those submitted in true faith.

All the 'Complaints' under this policy should be reported to the Group Head-Management Assurance at the following address:

Group Head – Management Assurance,

Vedanta, 75 Nehru Road

Vile Parle (E), Mumbai 400 099

'Complaints' can also be sent to the designated e-mail id: tspl.whistleblower@vedanta.co.in

## 16. GOVERNING LAW AND DISPUTE RESOLUTION

16.1 This Agreement shall be governed by, construed and enforced in accordance with the laws of Punjab, India.

16.2 Any dispute or difference whatsoever arising between the parties out of or relating to the interpretation, meaning, scope, operation or effect of this Agreement or the existence, validity, breach or anticipated breach thereof or determination and enforcement of respective rights, obligations and liabilities of the parties thereto shall be amicably settled by way of mediation. If the dispute is not conclusively settled within a period of twenty-one (21) days from the date of commencement of mediation or such further period as the parties shall agree in writing, the dispute shall be referred to and finally resolved by arbitration under the Arbitration and Conciliation Act, 1996 (as amended from time to time), which are deemed to be incorporated by reference into this clause. The arbitration shall be conducted as follows:

(i) A sole arbitrator shall be appointed in case the value of claim under dispute is less than ₹ 50,00,000 (Rupees Five Million Only) and in any other event by a forum of three arbitrators with one arbitrator nominated by each Party and the presiding arbitrator selected by the nominated arbitrators.

(ii) The language of the mediation and arbitration proceedings shall be English. The seat of arbitration shall be Bathinda, Punjab.

(iii) The award made in pursuance thereof shall be final and binding on the parties. The right to arbitrate Disputes under this Agreement shall survive the expiry or termination of the Agreement.

**Schedule II**

**APPENDIX A : VEDANTA SUSTAINABILITY CLAUSES**

1. Health, Safety and Environment (HSE) Systems Designation of Supervisor: The Contractor shall specify one of its employee as the Site HSE Supervisor who shall be responsible for attending HSE matters at all levels at the site of work, including emergency response.

Attendance of contractor: The contractor shall ensure that its site HSE supervisor is present at the place of work and performs supervisory functions at all times whenever four or more workers of the contractor or its sub-contractors are present at the place of work. Statutory Compliance: Contractor shall identify, document and comply with all pertinent Health, Safety and Environment (HSE) laws and regulations, approvals, licenses and permits which are applicable to the services and conduct of activities.

Contractor shall conduct internal inspections and record to ensure full implementation of requirements and compliance with the system at the site. Contractor shall provide documentary evidence that it has complied with the system, on company's demand.

Contractor Site management plan: The contractor should comply to his submitted plan in his bid document on how to manage and improve the work site. Page 7 of 12

2. Hazard and Risk Assessment

Pre and post Job Safety assessments: Contractor is responsible and accountable for ensuring effective procedures and assessment systems are in place to meet all HSE conditions.

Prior to the commencement of any operation/activity, Contractor must undertake a hazard and risk assessment, such as a job safety analysis or job risk analysis including control and mitigation process. The risk assessment should cover the following aspects of workplace

1. General Safety and Environmental Management Procedures
2. Waste Disposal
3. Equipment Decommissioning
4. Water Discharges
5. Material Storage/Spills
6. Storm Water Management
7. Use of Asbestos, Lead, CFCs and other objectionable chemicals.
8. Hot working, gas welding, etc.
9. All electrical works
10. Work at heights including scaffolding
11. Demolition
12. Construction work of any kind
13. Transport management
14. Tank cleaning or testing
15. Confined space, etc.

3. Awareness, Competency and Behavior

Awareness: Before commencement of any Services, Contractor shall at its own expense ensure that Contractor's Personnel have been given the necessary HSE training including training in hazard identification, risk analysis, safe working behavior etc. The HSE training shall include a briefing explaining the nature of the part of the Services they will be performing, a job safety analysis and description of the hazards, which may be encountered during the performance of the particular tasks, which they are required to perform. During such training, Contractor shall emphasize the fact that each person has an obligation to stop an act or task if it is unsafe. Contractor shall ensure that Contractor's

Personnel attend refresher courses to maintain familiarity with current procedures. Contractor shall provide evidence of completion of all training and competency assessments upon request by Company.

All Contractors' Personnel arriving on the site shall attend the Contractor's or Company's HSE inductions including a review of the site's safety procedures including Permit to Work and evacuation.
Contractor shall ensure safety meeting schedule, including but not limited to pre shift safety meetings, safety toolbox meeting, safety committee meetings and management review meetings.
Competency: The contractor shall ensure that all of its supervisory personnel performing work possess any specific competencies or qualifications, experience, responsibility and authorities required by applicable occupational health and safety laws, and shall provide proof of same satisfactory to company upon request.
Behavior: The contractor should provide adequate guidance so that contractor's personnel works to reduce workplace incidents and improve safe performance at all times. The contractor shall ensure that his staff conducts in a fit and proper manner whilst on site. Failure to do this may result in the removal or exclusion of such persons from the site.
4. Change Management: Page 8 of 12

If there is a change in site supervisor and contractor management personnel, it shall be notified to designated contractor manager as a part of Management of Change (MOC) process. This also includes reassess hazards and risk where the changes occur to the work scope, plant and equipment and the working environments.

5. Incident Reporting

Reporting: Any accident, injury, near misses, fire , explosion, spill of chemicals, environment degradation etc involving Company or Contractor's personnel, property or any third party property shall be reported immediately to Company, irrespective of whether injury to a person or damage to property or equipment resulted.

Access to site: If Company exercises its right to conduct its own investigation; Contractor shall provide Company with all reasonable assistance to allow & to complete its investigation.

Learnings: Contractor shall implement the learnings from incident to prevent a recurrence. Contractor must share lessons learned with Contractor's Personnel.

6. Safety Interaction

The contractor must conduct regular safety interactions of its Personnel in accordance with the Company's safety interaction process. The number and frequency of safety interactions to be performed will be at the discretion of the Company Representative. Quality assessments of the safety interactions will be undertaken by the Company's HSE Personnel.

The Service Provider must conduct investigations into incidents, accidents and injuries by its Personnel or involving its equipment and property in accordance with the Company's incident investigation process. Action items must be created to prevent recurrence and be closed out before due dates.

7. Emergency Drills

Contractor shall participate in emergency response drills to test the effectiveness of its emergency procedures and equipments and the knowledge and proficiency of Contractor's Personnel. Contractor will provide with their emergency response plan (ERP) which must be adoptable to suit the site.

8. Cardinal Rule*

Contractor shall ensure that all Contractors' Personnel follow the five safety cardinal rules. The rules are:

" Do not override or interfere with any Safety Provision nor let anyone else override or interfere regardless of seniority.

" Personal Protective Equipments (PPEs) applicable to the given task must be adhered to.

" Always follow isolation and lock out procedure

" No person will be allowed to work if under the influence of alcohol or drugs

" Report all injuries and illness On violation of cardinal rules, yellow card will be issued to the concerned personnel and disciplinary action will be taken which may result in suspension of personnel also.

* (Cardinal rules may vary from company to company)

9. Personal Protective Equipment Contractor shall, at its own expense, supply Contractor's Personnel, where required, in connection with the safe performance of the Services, with adequate protective clothing and other protective equipment including first aid which shall be maintained in good condition or replaced, and shall be worn at all times where required to manage potential injury hazards associated with a work activity under this Contract.

Contractor shall ensure that his personnel have been trained in the correct use and application of PPE. All such training shall be documented and available to company on request.

10. Equipment, Tools, Tackles and Resources Page 9 of 12

Contractor shall ensure that all plant, tools and equipment used by Contractor's Personnel in the performance of the Services are suitable for use for the particular task or tasks for which they are to be used, are maintained in safe and operable condition and that users of the plant, tools and equipment are trained, experienced and where necessary, licensed and certified to operate them.

Contractor shall maintain a register of all lifting equipment and tackle. Contractor shall, upon request, provide certification of inspection within the previous twelve months for all cranes and lifting slings and tackle before the equipment is used for the Work, and/or shall carry out such tests and inspections as are requested by applicable regulatory authorities. Safe Working Load (SWL) and radius charts shall be available for all lifting equipment and shall be marked on the equipment. Contractor shall ensure pre-inspection of lifting tools tackles including wire rope slings, clamps, shackes, hooks etc. before taking up the job. Company reserves the right to require,

Contractor to inspect any lifting gear that does not meet the requirements stated above. All equipment shall be stored and operated in accordance with the manufacturer's specification and guidelines.

Contractor shall maintain up to date copies of all tests and maintenance certificates relating to cranes, lifting beams pulley blocks and lifting gear, and shall make them available to the Company upon demand.

All tools & tackles required for the execution of the job shall be arranged by contractor. Also a periodic audit would be undertaken to assess the condition of such tools and tackles.

While using their equipment and carrying out any job, if any equipment / installation belonging to company or any other agency at site is damaged by contractor, it will be made good at the risk and cost of contractor.

Detailed risk assessments shall be conducted for all equipment to identify all foreseeable hazards and determine the most appropriate controls to mitigate the risks associated in using in accordance with HSE laws and regulation.

Vehicles operating in company premises shall observe all parking and speed restrictions, road signs and traffic rules as per company policy.

11. Material Safety Data Sheets

The contractor shall maintain, at the job site, Material Safety Data Sheets for all hazardous materials and products taken onto the job site.

Products are stored in appropriate containers clearly labelled prior to sending to site, all hazard substances are risk assessed to determine their safety requirements and suitability for use.

12. Work Permits

Contractor shall follow the site Permit to Work (PTW) system for carrying out hazardous activities that includes following (but not limited to) activities. The contractor shall not perform any of such activities without first obtaining and displaying the applicable work permit at the project site.

a.Hot work
b.Confined space entry
c.Working at height
d.Breaking into piping
e.Lockout / Tagout / isolation etc.
f.excavation or drilling into the ground or a concrete building slab using powered equipment
g.Hazardous substance handling, etc.
h.Excavation / trenching
i.Chemical management MSDS's
j.Any government related permit

13. Health and Fitness

Each contract employee shall undergo a pre-employment medical check and periodical medical examination (PME) as per the company guidelines by a company approved doctor/ medical personnel and cleared for the type of work he/ she will undertake, prior to the commencement of work. Page 10 of 12

Contractor shall ensure that all Contractors' Personnel are able to perform the essential functions of their respective assignments and shall certify the same to Company if so requested by Company or if required by law. Contractor's medical assessment process shall equal or exceed the requirements of Company's medical assessment procedure.

Contractor shall ensure health assessment, monitoring and management of contract personnel exposure to noise, dust and other physical hazards that have the potential to be harmful to health.

14. Disease

Contractor shall ensure that any of Contractor's Personnel who exhibit any symptoms of any severe infectious disease that is communicable by air or surface contact immediately make appropriate arrangements to be medically assessed and removed from the Site until they have received medical clearance and can provide proof of such clearance.

15. Hygiene and Housekeeping

Contractor shall ensure that Contractor's Personnel maintain high standards of hygiene and housekeeping on the Site. Contractor shall conduct routine hygiene and housekeeping inspections on the site to ensure that standards are maintained.

Contractor shall collect and segregate scraps generated by their activities or services by creating separate bins and finally deposit or utilize as per the directions of COMPANY.

16. Environment Protection

Contractor shall ensure proper collection and storage of used oil and waste oil generated at site. The used oil and waste oil collected so shall be disposed off in compliance to law. Any oil/grease soaked cotton waste would be collected from site of work and suitably disposed as per the guidelines.

Contractor shall use appropriate Personnel protective equipments and follow requisite procedure for handling, transportation and storage of Hazardous wastes inside the plant including disposal sites owned by company.

Contractor shall be solely responsible for damage caused to the surrounding/ environment during transit.

Contractor shall ensure optimum use of water, energy and other resources while providing services and also work for loss prevention in the form of leakages, spills, overflows, wastages etc

Contractor shall be solely responsible for the legal actions that may be initiated consequent to environmental hazards as aforesaid. Contractor would ensure that spillages, leakages and overflows etc are attended immediately on notice or on intimation.

17. Smoking

Contractor's Personnel shall not smoke at the work site except within designated smoking areas.

18. Contractor Accommodation

Where the Contractor's Personnel provides accommodation for contract workers, the accommodation shall be appropriate for its location and be clean, safe and, at a minimum, meet the basic needs of workers. In particular, the provision of accommodation shall meet national legislation and shall have the minimum following:

" Provision of sanitary, laundry and cooking facilities and potable water

" Safe location w.r.t health, hygiene and fire risks.

" Provision of first aid, medical facilities and proper ventilation.

" Building material shall be suitably inflammable, have smoke and fire alarms fitted and include other safety checks to prevent fire.

19. Clearance of Site

On a continuous basis consistent with Good Industry Practice during the progress of the Works the Contractor shall clear away and remove pursuant to the directions of the Owner from the Site all scrap, debris, other waste Page 11 of 12

materials. The Contractor shall, leave on the Site for the Owner such temporary works as instructed by the Owner, free of charge.

The Contractor shall at all times and particularly after completion of the Works, keep the Site and the Facility in a clean, safe and workman like condition and shall dispose of all rubbish (other than hazardous materials or other materials which may contaminate ground-water, for which other arrangements shall be made by the

Contractor) in accordance with Good Industry Practice.

20. Removal of unsafe Workers

The contractor shall document any identified instances of noncompliance with safety requirements by its workers and subcontractors. Where any worker or subcontractor breaches safety requirements and thereby presents a threat of serious injury or death to any person, the contractor shall remove that worker or subcontractor from the project site for the duration of the project.

21. Subcontracting

The Contractor shall be able to demonstrate that he has applied selection procedures that ensure that his sub-contractors are demonstrably competent to perform the works safely. The Contractor shall provide to the Location Manager the names of sub-contractors he intends to appoint in advance of entering into a contract with any such sub-contractor. The requirements of this booklet, the contract specification, the contract health and safety plan, the risk assessments and method statements shall be imposed upon sub-contractors by the Contractor.

22. Monitoring

Compliance check by contractor: The Contractor shall monitor his safety performance and that of his sub-contractors to ensure compliance with standards set in the contract. The frequency of monitoring will be dependent upon the risk profile and number of persons employed.

Root Cause of incidents: All accidents shall be investigated to establish the basic causes and to recommend appropriate improvements in control. Details of all accidents, together with the associated investigation and recommendations, shall be passed to the company as soon as deemed reasonable.

Audit by company: The Company reserves the right to audit all aspects of the management of health and safety on site at any time. Deficiency identified during any inspection / audit shall be entered into an appropriate action register that summarize the deficiency, the required actions, the person to whom that action have been assigned and date by which the action shall be completed.

The contractor shall be responsible to ensure all actions are completed, verified and closed within stipulated timeframes.

Monitoring by company: The Company reserves the right to allocate weight age and set safety KPIs in the contractor's scorecard. The scorecard performance shall be reviewed periodically.

23. Contractor Queries

The queries should be normally directed to company's designate as specified in contract. The site specific "contractor safety management manual" can also be referred for any clarifications when in doubt. The details on specific processes, plants and machineries and related hazards are detailed in this manual.

**APPENDIX B: CODE OF CONDUCT**

This code of conduct is applicable to all suppliers "('suppliers' herein refers to suppliers/ vendors/ gents/ consultants/ contractors/joint venture partners/third parties) who have business relationship with Vedanta" (Vedanta herein refers to the company and any its subsidiaries). Page 12 of 12

- Compliance with Laws: The suppliers shall ensure compliance to all governmental norms - local & international such as Environment Protection, Minimum wages, Child Labor, US Foreign Corrupt Practices Act, UK Bribery Act, Anti Bribery, Corruption, Health & Safety etc.
- Compliance with company policies: Shall follow all Environment, Health & Safety and other operational policies of the company while executing the work under this agreement/contract at company site.
- Conduct with company employees: forbid using inappropriate language in the workplace, including profanity, swearing, vulgarity or verbal abuse.
- Child Labor: oppose and do not permit the use of, forced or child labor.
- Unethical Behavior: Shall not take any recourse to any unethical behavior (implicit or explicit) with any employee of Vedanta for the purpose of obtaining an order or any information that may result in a favourable financial impact more specifically.
- Bribery & Corruption: Shall not offer or accept bribe or use other means of obtaining undue or improper advantage. No supplier or its representatives or employee, shall offer to any employee of Vedanta a kickback, favor, gratuity, or anything of value to obtain favourable treatment or for the advancement of business. Shall not take any advantage of any family/social/political connection in obtaining favour with regard to any order merit shall be the sole attribute for association with Vedanta.
- Undue Favor: Shall not offer any gift or entertainment for the purpose of obtaining an order or any undue favor (also refer the Gift policy of Vedanta which is uploaded on company website).
- Reporting violations of code: Shall forthwith report any unethical activity or discrimination if practiced by any Vedanta employee/other suppliers as per Vedanta whistle blower policy (uploaded on the company website).
- Competition and fair dealing: Shall desist from unfair trade practices with your competitors who are also associated with Vedanta.
- Confidential Information: Shall protect and not in-fringe with any Vedanta intellectual Property /information /technology which comes to your knowledge during the course of your business relationship /dealings with Vedanta.
- The financial and sales results of the Company, or any member of the Company, before they are in the public domain.
- Trade secrets, including any business or technical information, such as formulae, recipes, process, research programs or information that is valuable because it is not generally known.
- Any invention or process developed by an employee using the Company's facilities or trade secret information resulting from any work for the

Company, or relating to the Company's business.

- Proprietary information such as customer sales lists and customer's confidential information
- Any transaction that the Company or any member of the Company is or may be considering which has not been publicly disclosed Vedanta expects its suppliers to comply with the conditions of the supplier code in letter and spirit. It is the supplier's responsibility to read and understand the contents of Vedanta's supplier code and code of conduct & business Ethics policy and agree to uphold its values during your business association with Vedanta. Please contact the concerned Head Commercial/Company Secretary if you any questions about the supplier code.