TENDER DOCUMENT FOR Operation & Maintenance contract of Power Plants

CPP 540 MW & 1200 MW

TENDER NO: BALCO/COM/SER/O & M/AR/2017-11/07

To,

Head Commercial
Bharat Aluminum Company Ltd.
Commercial Office
Admin Building, 1st Floor
BALCO NAGAR
KORBA – 495684
Chhattisgarh State
India
E-mail: ashish.raghuwanshi@vedanta.co.in
INDEX

1. Instruction to the Bidder.
2. Offer letter.
5. Commercial Terms & Conditions

We are looking forward to an extended relationship and are open to negotiate long term contracts (3 years) if that is mutually beneficial.

Please note that completion of the response, in terms of the Formats to be filled and data to be furnished, will be one of the criteria for evaluation of the vendors.

We will be happy to assist you with the process. Feel free to reach out to any of the people listed below.

For Clarifications:

Commercial: Mr. Ashish Raghuwanshi (Mob. No: 09589338228)
Technical: Mr. Gaurav Tandon : Mob.No. 9981124345

BIDS SHALL REACH US WITHIN 07 DAYS OF THIS ADVERTISEMENT.
1) INSTRUCTION OF BIDDERS

Vedanta Resources plc (“Vedanta”) is a LSE listed FTSE 100 Company with a market cap including that of its listed subsidiaries of about $ 50 billion. We operate across the following core business sectors: Zinc-Lead-Silver, Copper, Aluminum, Iron Ore and Energy, with operation located in geographies spanning India, Australia, UAE, Zambia, South Africa, Namibia and Ireland. Over the past 5 years the group has displayed exemplary appetite for organic and inorganic growth-with an industry leading organic growth program of $ 20 billion nearing completion.

Bharat Aluminium Company Limited (BALCO), a Member of Vedanta India is a fully integrated Aluminium producer with an installed capacity of 245 ktpa aluminium and 810 MW of power. We are currently implementing expansion projects, which includes a 650 ktpa capacity Aluminium smelter (1st phase 3.25 ktpa) and 1200 MW Power Plant. With the completion of these projects, BALCO will have a total installed metal capacity of 1 mtpa and 2010 MW of power. Our metal business currently produces 75 ktpa rolled products & 200 ktpa wire rods & with completion of 1st phase metal expansion, rolled products & wire rods capacity shall increase to 80 ktpa & 500 ktpa respectively. Our businesses also include a coal mines and operating Bauxite mines.

What BALCO is looking forward with this contract:

- High Level of Service quality.
- 100% adherence to all the deliverables.
- Zero accidents environment.
- 100% reporting of all the near miss incidents and corrective measures for all to ensure no accident due to the unsafe conditions.
- Increased availability of all the equipments and the total system to ensure better efficiency and higher levels of productivity.
- Ensuring higher productivity per man hour by introducing better Operating Procedures.
- Introduction of innovative ideas which can save in terms of time or money.

Kindly provide the following detail:

1. Detailed credential document of Your firm
2. Last Year turnover detail along with Profit & loss statement.
3. Top 5 Major Order executed in last two year.
4. Top 5 Major Order executed for similar job in last two year.
5. Major Client detail.
6. Your GST reg Number.

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
Information / Credential of Service Providers / Bidder

The following information is Compulsory and should be furnished completed in all aspects along with your offer.

I. Brief history of organization, along with organization chart, mentioning the Name, Designation & Tel. Nos of the contact persons in your company holding all key positions.

II. Client list, with copies Contracts of your Top 5 clients.

III. Banker’s name and your Company’s annual audited report / Balance Sheet for last 3 years.

IV. The details of Machinery and Equipment available with you which are in working condition are to be furnished.

V. If the space provided in the registration form is not sufficient, please attach separate Sheets and give Annexure reference number on the attached sheet.

VI. Registration Details

VIII. Registration No. and date (Kindly attach a photocopy of registration certificate)

IX. Membership to any body

X. Any other Statutory Registration.

XI. Registration details with taxation authorities:

   b. Service tax Registration

XII. For any new agency participating first time in BALCO tendering, must register their company as new service vendor on our SRM Portal at [www.balcoindia.com/vendorzone](http://www.balcoindia.com/vendorzone)
2) FORMAT FOR OFFER LETTER

Head Commercial  
Bharat Aluminum Company Ltd.  
Commercial Office  
Admin Building  
BALCO NAGAR  
Korba – 495684

Offer reference N.: /………….dt. 2017:

Sir,

1. We hereby undertake to perform the scope of work as defined in the condition of Bharat Aluminum Co. Ltd., Tender Ref no:…………………………., dated…..2017 at the prices and within the period stated in the attached schedules & in conformity with all the conditions is included therein.

2. This offer is valid for a minimum period of 90 days.

3. We agree that any Contract placed as result of this offer will be in accordance with the terms & conditions in the said offer. We declare that any other terms or conditions of the contract or any general reservations which may be printed on any correspondence of documents emanating from us in connection with tender shall not form part of any resulting contract unless specifically agreed to by BALCO and included in this contract.

4. We also enclose herewith the following documents:

   A. Schedule of compliance with
      1. Acceptance of contract conditions & Balco Standard terms & conditions .
      2. Schedule of prices (Price Formats to be completed)
      3. The offer should contain all the details like Service Tax Reg. No. etc.

   B. Documents required by BALCO as mentioned in “Instructions to Bidders”.

M/s (Name and Address of the Company)

Signature of the authorized Signatories

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
3) SCOPE OF WORK OF 4X135 MW AND 4X300 MW THERMAL POWER PLANTS

<table>
<thead>
<tr>
<th>S.no</th>
<th>Description</th>
<th>Installed quantity in 135x4</th>
<th>Installed quantity in 300x4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Boiler (HARBIN BOILER)</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Scanner Fan</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>PA Fan</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>FD Fan</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>ID Fan</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>Seal Air Fan</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>7</td>
<td>Air Preheater</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>Elevator</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>9</td>
<td>ESP +Fabric Filter</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>DG set (Cummins make)</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>11</td>
<td>DG set (Cummins make)</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>12</td>
<td>Mill (Boul Mill)</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>13</td>
<td>Generator</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>14</td>
<td>Turbine (DONGFONG)</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>15</td>
<td>TD BFP</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>16</td>
<td>Motor BFP</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>17</td>
<td>Condenser</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>18</td>
<td>Condensate extraction pump</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>19</td>
<td>Vacuum Pump</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>20</td>
<td>MOT</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>21</td>
<td>CW Pump House</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>22</td>
<td>CT Fan</td>
<td>22</td>
<td>40</td>
</tr>
<tr>
<td>23</td>
<td>Screw compressor</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>24</td>
<td>Screw compressor</td>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>25</td>
<td>Centrifugal compressor</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>26</td>
<td>Turbine hall EOT</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>27</td>
<td>Hydrogen Plant</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>28</td>
<td>GIS &amp; SwitchYard (siemens)</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>29</td>
<td>Raw Water Pump</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>30</td>
<td>Geho Pump</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>31</td>
<td>Ash Silo</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>32</td>
<td>Track Hopper</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>33</td>
<td>DCS Main Plant</td>
<td>Honeywell + Invensys (DEH)</td>
<td>Invensys</td>
</tr>
<tr>
<td>34</td>
<td>PLC- Major</td>
<td>Rockwell + Siemens</td>
<td>Rockwell</td>
</tr>
<tr>
<td>35</td>
<td>DM Plant</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>36</td>
<td>Stacker Reclaimer</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>37</td>
<td>Common Ash Silo</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
Note: The above indicative details are given to understand the plant capacity and type of plant. This indicative list is only for the purpose of briefing the technical details. Exhaustive list is not given here, as all other associated systems will be covered in detailed scope. Contractor has to visit the site to confirm the site details. Any modification and installation of new equipment will remain in scope of contractor.

**APPENDIX-I**

### O&M RESPONSIBILITY MATRIX

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Description of Work / Activity</th>
<th>Responsibility Matrix /Scope</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Total O&amp;M of 4x300 &amp; 4x135 relevant facilities Including CHP/AHP except Main CCR- desk operation and GIS shift operation.</td>
<td>BALCO</td>
<td>Contractor</td>
</tr>
<tr>
<td>2</td>
<td>Housekeeping, cleaning &amp; Horticulture of the Entire plant and its associated roads, pathways &amp; adjoining area covered under the factory boundary.</td>
<td>BALCO</td>
<td>Contractor</td>
</tr>
<tr>
<td>3</td>
<td>Plant Upkeep Services</td>
<td>BALCO</td>
<td>Contractor</td>
</tr>
<tr>
<td>4</td>
<td>Cleaning and shifting of COAL/ASH accumulated due to leakage/ Maintenance/breakdown etc.</td>
<td>BALCO</td>
<td>Contractor</td>
</tr>
<tr>
<td>5</td>
<td>Maintenance of internal roads, building and minor civil works</td>
<td>BALCO</td>
<td>Contractor</td>
</tr>
<tr>
<td>6</td>
<td>All Type of Fuel required for Operation of Plant</td>
<td>BALCO</td>
<td>Contractor</td>
</tr>
<tr>
<td>7</td>
<td>All type of lubricants which go into the System / equipment</td>
<td>BALCO</td>
<td>Contractor</td>
</tr>
<tr>
<td>8</td>
<td>All type of Consumables which goes in to the System / equipment.</td>
<td>✓</td>
<td>O&amp;M contractor need to keep attached list of consumable in adequate stock.</td>
</tr>
<tr>
<td>9</td>
<td>Coal Handling</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>10</td>
<td>Ash Handling</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>11</td>
<td>All type of chemicals required for Boiler, DM Plant, Raw Water Plant, CW System etc.</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>12</td>
<td>Spares Parts which goes in to the System / equipment</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>13</td>
<td>Inventory of Spare Part in accordance with the OEM’s</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>14</td>
<td>Lighting of the plant/Road/ High mask/Gates/weighbridges etc.</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>15</td>
<td>Laboratories:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Electrical Laboratory along with Calibrated Test Instruments &amp; equipment</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>B</td>
<td>Instrumentation Laboratory along with Calibrated Test Instruments &amp; equipment</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>C</td>
<td>Chemical Laboratory along with Calibrated Test Instruments &amp; equipment</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Contractor has to make sure that all equipment’s & protection relay of Electrical and C&I to be tested, calibrated once in a year by OEM/government authorized agencies as accepted by BALCO.

| D | Motor Rewinding | ✓ | ✓ |

HT motor by BALCO & LT motor (including small actuators/DC motors by Contractor including TB, Boxes & Cooling fan.)

| E | Condition Based Monitoring (CBM) | ✓ | |

Routine CBM to be carried out by O&M contractor include Oil, Vibration, thermography etc. and timely corrective action to be taken based on the findings.

| F | Water chemistry | ✓ | |

Contractor has to provide complete services for Cooling tower and DM water chemical analysis by third part on daily basis for the recommendation and analysis on water chemistry.

| 16 | Plant Security | ✓ | ✓ |

BALCO is already having Plant security. O&M contractor if required shall have his own security for his own stores/offices

| 17 | Stores Management / Material / Scrap Management services. | ✓ | ✓ |

Central Material Management shall be part of BALCO scope. On proper authorization from engineer in charge Contractor will draw Material / spare parts from stores using Mechanized handling & transportation to work place for temporary storage / usage shall be in Contractor’s scope. Segregated scrap and its Disposal/shifting inside BALCO premises are in the scope of the contractor at designated place given by BALCO.

| 18 | Regular, Preventive, Breakdown maintenance, troubleshooting and diagnosis of problems. | ✓ | ✓ |

It shall be a part of contract and during the execution if any expert services other than available at site or mentioned in the list of OEM services will be required that has to be arranged by the contractor timely in discussion with BALCO. Servicing/ replacement/overhauling /new installation of valves & actuators will be in the scope of the contractor.

| 19 | Annual Maintenance Contract with OEM's | ✓ | ✓ |

Contractor shall have AMC with OEMs/ Statutory body as per the requirement including DCS/ GIS / PLC and Analysers AMC and as per the scope of the contract.

| 20 | Overhauling Cycle of Turbine, Boiler and Generator | ✓ | ✓ |

Overhauling of Units in every 2 years as per the IBR rule, this include Boiler and its associate equipment’s, LP turbine, Pipes and Ducts, Generator, ESP, Mills etc (scope will be given separately). However in case of any major replacement/ addition of equipment is in scope of the BALCO (Tentative duration of 18 Days each for 2 units in a year).

| 21 | Special Tools and Tackles | ✓ | ✓ |

Special T&P’s provided by OEM shall be handed over to contractor. All other T&P are in the scope of Contractor. Operation &
<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Available</th>
<th>Contract Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>Use of EOT's Cranes &amp; Lifts</td>
<td>✓</td>
<td>Maintenance contractor to provide operator &amp; also to maintain the crane. Boiler/turbine lift maintenance will be in scope of contractor.</td>
</tr>
<tr>
<td>23</td>
<td>Manpower for Maintenance</td>
<td>✓</td>
<td>Contractor shall indicate manpower strength-category wise. Qualification and experience shall also be given.</td>
</tr>
<tr>
<td>24</td>
<td>O&amp;M of Truck Tippler</td>
<td>✓</td>
<td>Complete O&amp;M of truck tippler is in scope of the Contractor.</td>
</tr>
<tr>
<td>25</td>
<td>Telephone facilities</td>
<td>✓</td>
<td>Contractor has to provide area wise mobile phone connection round the clock.</td>
</tr>
<tr>
<td>26</td>
<td>Medical &amp; Dining hall Facilities at Plant Premises.</td>
<td>✓ ✓</td>
<td>Medical &amp; Dining hall facilities, as available in the factory premises will be provided by BALCO. However the required First aid Kit facility to be maintained by contractor.</td>
</tr>
<tr>
<td>27</td>
<td>Statutory Compliances Environmental aspects Boiler Inspectorate Electrical Inspectorate Factory inspectorate / Licensing and Permits from local &amp; central authorities</td>
<td>✓ ✓</td>
<td>All liasoning fees will be borne by Contractor and all other formalities required for getting various statutory clearances will be executed by contractor.</td>
</tr>
<tr>
<td>28</td>
<td>Guarantee of Plant Operational Availability</td>
<td>✓ ✓</td>
<td>Shall be as per the Contract</td>
</tr>
<tr>
<td>29</td>
<td>Testing Instrument :</td>
<td>✓ ✓</td>
<td>Instruments as handed over by EPC shall be made available to maintenance contractor. All other instruments required shall be in scope of maintenance contractor. Usage, upkeep, calibration, testing and maintenance of the same shall be with Contractor. Generator transformer, unit transformer, station transformer, oil testing (DG) to be done once in a year from authorized agencies as accepted by BALCO</td>
</tr>
<tr>
<td></td>
<td>a) Transformer winding resistance meter</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b) Transformer Ratio meter</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c) Tan delta meter to measure tan delta</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d) Relay testing kit (all relay)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>e) Primary Injection Test Kit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>f) Power meger (5KV)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>g) HV test kit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>h) Growler for Motor-rotor testing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>i) Vibration Measuring Equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>j) Test Instrument for calibration Purpose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Mobile Crane/ Cherry Picker and Truck / Trailer with Operator, as &amp; when required.</td>
<td>✓ ✓</td>
<td>All the lifting/shifting and operational equipment's required in the plant along with its operator will be in the scope of contractor. List of such equipment along with numbers will be given by BALCO.</td>
</tr>
<tr>
<td>31</td>
<td>Daily/Weekly/Monthly Report and MIS and Efficiency for the O&amp;M activities.</td>
<td>✓</td>
<td>Contractor has to daily generate the MIS/ Maintenance report for the daily work carried out by them on a Mutually agreed Format and Monthly report in hard copy to the management highlighting Monthly Breakdown/Modification/Achievement/spare consumption and next month Job planning.</td>
</tr>
<tr>
<td>32</td>
<td>O&amp;M of firefighting &amp; detection system of the entire plant.</td>
<td>✓</td>
<td>by O&amp;M Contractor</td>
</tr>
<tr>
<td></td>
<td>Coal/ water/chemical sample collection and Maintenance of sampling &amp; analysis equipment of all the lab (GCV, Moisture, Ash &amp; Jaw Crusher in CHP &amp; Lab equipment's)</td>
<td></td>
<td>by O&amp;M Contractor</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>33</td>
<td>Any minor modifications, mutually agreed between BALCO &amp; Contractor, required for system improvement (availability / reliability)</td>
<td>✓</td>
<td>Modification to be carried out by the contractor for improvement of plant efficiency and reliability. Any material/spare required for the same is in scope of the contractor.</td>
</tr>
<tr>
<td>34</td>
<td>Online Leak Sealing</td>
<td>✓</td>
<td>by O&amp;M Operator</td>
</tr>
<tr>
<td>35</td>
<td>Water Treatment Plant</td>
<td>✓</td>
<td>From pump house including entire raw water line to be maintained by O&amp;M Contractor. Approx. distance of 9 Km from plant.</td>
</tr>
<tr>
<td>36</td>
<td>Paint</td>
<td>✓</td>
<td>Touch up/painting to equipment as and when required will be in scope of the contractor.</td>
</tr>
<tr>
<td>37</td>
<td>Power evacuation</td>
<td>✓</td>
<td>Power Dispatch clearance and all the communications related to power export/import to PGCIL grid is in scope of BALCO. However any maintenance of GIS/Switch yard /Transmission line/tower/ attending hot spot/ Liaisoning/ Fiber optics laying on transmission tower and jointing will be in scope of O&amp;M Contractor.</td>
</tr>
<tr>
<td>38</td>
<td>Shop Repairs / Workshop</td>
<td>✓</td>
<td>Contractor has to do tie up with the workshop available in the vicinity of the plant. Any repairs/machining jobs to be executed on priority for BALCO, including transportation. O&amp;M operator shall provide required assistance to owner for works like removal, re installation, loading &amp; unloading from vehicle. For any repair/reconditioning that can be executed within KORBA at any workshop will be in scope of the contractor.</td>
</tr>
<tr>
<td>39</td>
<td>Operational Assistance</td>
<td>✓</td>
<td>Boiler operator/ PLC operator for AHP/CHP/DM Plant/ Valve operator and any other operators required for the assistance of the operation is in the scope of the contractor.</td>
</tr>
<tr>
<td>40</td>
<td>ISO Certification</td>
<td>✓</td>
<td>O&amp;M Operator shall involve themselves with the consultant engaged by the Owner for ISO. All the work required for this will be carried out by O&amp;M Operator under the guidance and direction of the BALCO. O&amp;M Operator must be involved there teams in QC, Kaizen, 5S and other activities and support them for the skill development and R&amp;R scheme.</td>
</tr>
</tbody>
</table>

**NOTE:** ---The BIDDER/Contractor shall ensure completeness in O & M of the entire system for proper workability. Any item not specifically mentioned in this Scope of Work, but required for the completeness & smooth performances of the Plant O & M, shall be the part of the scope of work.
GUARANTEES & PENALTIES

O&M Operator shall maintain the Guarantees as defined in this clause and is liable to Liquidated Damages ("LD") mentioned against specified Guarantee parameters in case of failure to achieve or non performance.

<table>
<thead>
<tr>
<th>S.no</th>
<th>Key KPI of O&amp;M</th>
<th>4x135</th>
<th>4x300</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Station Availability (excluding Scheduled 2 Over Hauling of 18 Days each in a year)</td>
<td>97%</td>
<td>97%</td>
</tr>
<tr>
<td>2</td>
<td>Safety (Any incident/ First aid)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>Asset Optimization score card ( will change on YOY )</td>
<td>&gt;80</td>
<td>&gt;70</td>
</tr>
<tr>
<td>4</td>
<td>Availability of critical equipment (like UPS/DG sets/Fire Fighting system/Battery Banks/ AC- DC emergency drives etc)</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

GUARANTEES

1.1 The O&M Operator shall guarantee to the Owner that Annual Station Availability Factor (the ASAF) of 97%.

1.1.1 Formula of ASAF

\[ \text{SAH + SDH} \]

\[ \text{Station Availability Factor} = \frac{\text{SAH + SDH}}{4 \times \text{PH}} \]

Where:
- SAH is the sum of AH of Unit #1 to #4
- SDH is the sum of DH of Unit #1 to #4

AH is the actual Unit running hours capable of running at full load as defined in clause 1.3.

DH is the deemed availability hours of a Unit as defined in “Deemed Availability”.

PH is period hours during the period under consideration, e.g. 8760 hrs. for a normal year (8784 hours for leap year).

1.1.2 Any Unscheduled Unit Tripping on account of Mechanical / Electrical/ GIS/ Instrumentation will be in account of station availability

1.1.3 “Deemed Availability”
If the Station or Unit is under shutdown or part loaded due to the followings, the hours shall be considered as Deemed Availability:

1) Reasons attributable to the Grid/ export restriction/ Smelter.

2) Force Majeure Conditions as defined herein.

a) Contractor has to list down the list of critical spares that should be available at site in consultation and proper justification with the owner for all the equipments with priority on equipments where redundancy is not available.

If the Contractor has not raised any requirement/ justification for the spare prior to the breakdown the duration of the breakdown will not be considered in Deemed availability. However if spares not available in consent with the Owner it will be considered in deemed availability. (where redundancy is not available).

b) Reduction in station availability due to non availability of equipment will be calculated as follows.

i) If standby equipment not available and station generation is 100% then it will be considered as deemed available.

ii) If equipment not available and station generation reduced then non availability will be calculated on prorata basis as follows for the non available duration.

(a) Mills – (CPP-2 (33%) , CPP-3 (25%) of unit availability will be reduced for non availability of one mill (CPP-540 Minimum 3 mills should be available/ Unit and CPP-1200 Minimum 4 mills should be available/ Unit).

Similarly for BFP & TD BFP (CPP-540 have 2 Nos of MBFP CPP-1200 Have 1 Nos. MBFP & 2 Nos of TDBFP

(b) For all other equipment - 50% of unit availability will be reduced for non availability of respective equipments.

1.2 Unit or Station availability means Unit available for full load generation as per Rated Capacity subject to due corrections from the correction curves with respect to variable factors.
However, when the Unit or Station is running at load other than the Rated Capacity,
which is attributable to Owner, Available Hour shall be calculated on pro-rated basis.

But the Unit or Station is running at lower load due to O&M contractor fault, available hour shall be calculated based on actual load on prorated basis. Other than this, Deemed Hour shall be applicable.

1.3 Liquidated Damages

In case of non-performance of the O&M Operator in respect of KPI and Station Availability for the reasons not attributable to Owner and subject to the conditions as defined herein, the Owner shall levy the penalty as follows

1.3.1 Penalty Clause

1. For every 1% reduction in the Station Availability, 1% of Monthly O&M Fees will be deducted on pro rata basis. However initial 3 months of the contract will be exempted.

2. Owner believes in following zero harm culture to the people & environment to make it effective following penalties can be levied on the contractor.
   a) Basic PPE and Cardinal Rule must be complied from the point of entry inside the plant premises.
   b) Penalty of Rs 500/ person found without proper PPE for the first instance and repetition of the same person the amount gets doubled with disciplinary action.
   c) Penalty of Rs 10,000/- on the contractor along with suspension of the person if the person was found violating the safety instructions frequently.
   d) Penalty of Rs 50000/ on the contractor along with the termination of the worker/workers for execution of work without proper permits/SOP/SMP and negligence.
   e) For any incident due to unsafe act or negligence by the employees of the contractor the cost shall be Bourne by the contractor.

3. As per the Vedanta Asset optimization Score Card Contractor has to achieve the target of Contractor score card of (Minimum 80% for CPP-2 and 70% for CPP-3).
For the drop of each percentage of minimum score penalty of Rs 10000/- will be applicable.
Similarly for increase in each percentage of minimum score Bonus of Rs 10000/- will be applicable.

4 Penalty on housekeeping and Scrap shifting
Based on Monthly 5S Audit jointly done by the owner and the Contractor penalty will be put based on the site housekeeping and 5S Score.

5 Due to non-availability/ partial availability of emergency critical equipment due to any reason on part of O&M contractor penalty of 0.1% of the monthly O&M fees/ non available equipment will be charged.

1.4 The maximum aggregate liability on account of non-fulfillment of the above-mentioned guarantee parameter shall be limited to 10% of the relevant yearly O&M Fees.

Termination, Risk and cost of the Contracts

1 Owner has rights to carry out any job mentioned in the technical scope of the work at the risk and cost of the contractor on the non performance/ fulfillment of the work assigned in this scope of contract.

2 Owner has the rights to terminate the contract at any point of time on gross negligence and non-performance by the contractor on the given KPI’s, terms and condition mentioned in the technical scope of work.

SCOPE OF WORK FOR MECHANICAL MAINTENANCE – 4x135 MW

Areas covered under steam Turbine
  ➢ Steam turbine of all 4 units

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
Steam turbine lubricating oil system and associated systems of all 4 units
Steam turbine jacking oil system and associated systems of all 4 units
Steam turbine governing oil system and associated systems of all 4 units
Boiler feed water pumping systems and associated systems of all 4 units
Condensate water system and associated systems of all 4 units
Condenser and associated systems of all 4 units
Feed water heaters and associated systems of all 4 units
De-aerator and associated systems of all 4 units
HP and LP process lines and associated systems of all 4 units
Service & make up water system of steam turbine and auxiliaries of all 4 units
Circulating and cooling water system of steam turbine and auxiliaries of all 4 units
EOT cranes and Hoists of all 4 units
Industrial cooling water circuit of all 4 units
Gland sealing system of steam turbines of all 4 units
Valves and piping’s of steam turbine area of all 4 units

MAINTENANCE OF LUBRICATING /JACKING AND GOVERNING OIL SYSTEM OF TURBINE

Preventive maintenance and servicing of AC LOP, DC LOP, MOT exhaust fans, JOP, EHOP, EHOCP, AOP, EH oil tank etc.
PM and servicing to be carried out as per given SMP and checklist.
Internal and external cleaning of all equipments of lubricating and governing oil system of turbine-MOT, AC LOP, DC LOP, MOT exhaust fans, MOT Body, Pipelines, JOP, JOP Panel, JOP tray, EOP, AOP, EOCP, EH oil tank, coolers etc.
Checking of any leakage from any of the above equipments needs to be identified and attended.
Checking, identifying and attending leakages from valves of lubricating oil, jacking oil and governing oil circuit.
Replacement/repairing of AC/DC LOP/JOP/EOP/EOCP pumps, Valves and Pipelines as per requirement.
Checking of oil levels in MOT and EH oil tanks and Oil top up, as and when required.
Removing all waste oil drums and shifting to Oil Yard from Turbine Area.
Removal & re-fixing of gratings for assisting housekeeping personnel for cleaning of equipments and area.
Removal and re-fixing of gratings during maintenance work.
Cleaning of Plate type heat exchangers as per requirement.
Servicing of Test valves/3 way valves/Emergency shut-off valves/Temp. Control valves/Fire protection valves/Isolation valves/Pressure relief valves etc
Cleaning of Duplex Strainer / basket strainers & Control oil line filters.
Providing assistance for taking of oil sample from MOT and Centrifuge as and when required.
Cleaning & Maintenance of Dirty oil tank, clean oil tank etc.
Attending gland leakage of all Valves inside the MOT.
Attending flange leakage of all flanges inside the MOT.
Replacement of glands, bearings and couplings of Dirty oil, Drain oil, clean oil & Leakage oil Pumps.
Replacement of bearings, gland packing and coupling of all equipments.
Cleaning of MOT exhaust fan suction strainers and MOT bucket strainers as per requirement.
Setting of line pressures/pump pressures of lubricating oil, jacking oil and governing oil as per requirement.
Making arrangements for back flushing of EH oil and MOT PHE, supporting operation team during back flushing as per requirement.
- Cleaning and painting of all these equipments and pipelines after overhauling as per instruction of EIC.
- Painting should be carried out with spray painting gun and kit should be kept ready all the time.
- Supporting C&I and electrical team as per requirement and instruction of EIC. Jobs such as decoupling of motor, welding arrangement and mechanical arrangements needed to support electrical and C&I team.
- Checking of alignment of Pump with Motor and do the necessary correction if required.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instruction of EIC. Area should be maintained clean and dry all the time.
- Cleaning of equipment and associated systems to be carried out in every PM.
- Cleaning and painting of equipment and associated systems to be carried out in every overhauling.

**Abbreviations**
- MOT-Main oil tank
- AOP-Auxiliary oil pump
- AC LOP-Alternating current lubricating oil pump
- DC LOP-Direct current lubricating oil pump
- JOP-Jacking oil pump
- EOP-EH oil pump/Governing oil pump
- EIC-Engineer in-charge
- PM-Preventive maintenance
- EH-Electro hydraulic

**MAINTENANCE OF DIRTY / LEAKAGE / DRAIN OIL PUMP**
- Carry out external cleaning of equipment.
- Check all joints for leakages if any arrest it.
- Check all holding down bolts for tightness and take corrective action if required
- Check gland leakages if leakage is to be observed, same to be attended either by replacing the glands or by tightening it.
- Check coupling spider for damage, if necessary replace it.
- Attend all leakages.
- Checking of alignment of Pump with Motor and do the necessary correction if required.
- Inspection / Replacement of bearings of Clean / Dirty / Leakage Oil Pumps.
- Cleaning and painting of all these equipments and pipelines as per instruction of EIC.
- Painting should be carried out with spray painting gun and kit should be kept ready all the time.
- Supporting C&I and electrical team as per requirement and instruction of EIC. Jobs such as decoupling of motor, welding arrangement and mechanical arrangements needed to support electrical and C&I team.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.
- Cleaning of equipment and associated systems to be carried out in every PM.
- Cleaning and painting of equipment and associated systems to be carried out in every overhauling.

**MAINTENANCE OF CENTRIFUGE / PORTABLE CENTRIFUGE**
- Carry out external cleaning of equipment.
- Check all joints for leakages if any arrest it.
- Attend all leakages.
- Cleaning of bowls to be done.
- If required replacement of Gear box oil.
- Arresting leakage from view glass & servicing the same.
- PM and Overhauling of MOT centrifuge system to be carried out as per SMP and PM checklist.
- Complete servicing of Centrifuge that includes servicing of oil pump, booster pump, main pump, three way valve, and replacement of worm gear.
- Cleaning and painting of all these equipments and pipelines as per instruction of EIC.
- Painting should be carried out with spray painting gun and kit should be kept ready all the time.

**TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS**
Supporting C&I and electrical team as per requirement and instruction of EIC. Jobs such as decoupling of motor, welding arrangement and mechanical arrangements needed to support electrical and C&I team.

Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

Cleaning of equipment and associated systems to be carried out in every PM.

Cleaning and painting of equipment and associated systems to be carried out in every overhauling.

**MAINTENANCE OF HP (Phosphate dosing pump) / LP (Hydrazine / Ammonia) DOZING PUMPS AND NaOH DOSING SYSTEM**

- Carry out external cleaning of equipment.
- Check all joints for leakages if any arrest it.
- Check all holding down bolts for tightness and take corrective action if required.
- Check gland leakages if any arrest it if leakage is to be observed, same to be attended either by replacing the glands or by tightening it.
- Check coupling spider for damage, if necessary replace it.
- Check the tightness of coupling bolts.
- Attend all leakages either by welding or replacement of gland/gaskets.
- Installation of new HP / AMMONIA / HYDRAZINE dosing pumps and servicing of removed / old HP / AMMONIA / HYDRAZINE dosing pumps and keeping it ready for future use.
- Routine Maintenance of mixing tank agitators & greasing of agitator shaft coupling.
- Routine Maintenance of NaOH dosing system & greasing of agitator shaft coupling.
- Replacement of bearings, Gland packing, Internal of pumps / Agitator, etc.
- Check for any leakage in NaOH dosing system, if leakage is to be observed, same to be attended.
- Minor modification of NaOH dosing system.
- Cleaning and painting of all these equipments and pipelines as per instruction of EIC.
- Painting should be carried out with spray painting gun and kit should be kept ready all the time.
- Supporting C&I and electrical team as per requirement and instruction of EIC. Jobs such as decoupling of motor, welding arrangement and mechanical arrangements needed to support electrical and C&I team.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.
- Cleaning of equipment and associated systems to be carried out in every PM.
- Cleaning and painting of equipment and associated systems to be carried out in every overhauling.

**MAINTENANCE OF LP BYPASS SYSTEM**

- Carry out external cleaning of equipment.
- Check all joints for leakages if any arrest it.
- Check all holding down bolts for tightness and take corrective action if required.
- Check for air leakages if any arrest it.
- Gland leakage to be arrested if any either by tightening or by replacing packing’s.
- Bonnet leakage to be arrested if any either by tightening or by replacing pressure seal.
- Actuator/valve bush to be replaced if necessary.
- Cleaning and painting of all these equipments and pipelines as per instruction of EIC.
- Painting should be carried out with spray painting gun and kit should be kept ready all the time.
- Supporting C&I and electrical team as per requirement and instruction of EIC. Jobs such as welding arrangement and mechanical arrangements needed to support electrical and C&I team.

**TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS**
Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instruction of EIC. Area should be maintained clean and dry all the time.

Cleaning of equipment and associated systems to be carried out in every PM.

Cleaning and painting of equipment and associated systems to be carried out in every overhauling.

**MAINTENANCE OF HP BYPASS SYSTEM**
- Carry out external cleaning of equipment.
- Check all joints for leakages if any arrest it.
- Check all holding down bolts for tightness and take corrective action if required.
- Check for any air leakages if any and arrest it as and when required.
- Gland leakage to be arrested if any either by tightening or by replacing packing.
- Bonnet leakage to be arrested if any either by tightening or by replacing pressure seal.
- Actuator/valve bush to be replaced if necessary.
- Cleaning and painting of all these equipments and pipelines as per instruction of EIC.
- Painting should be carried out with spray painting gun and kit should be kept ready all the time.
- Supporting C&I and electrical team as per requirement and instruction of EIC. Jobs such as welding arrangement and mechanical arrangements needed to support electrical and C&I team.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.
- Cleaning of equipment and associated systems to be carried out in every PM.
- Cleaning and painting of equipment and associated systems to be carried out in every overhauling.

**MAINTENANCE OF BOILER FEED PUMP, BOOSTER, HYDRAULIC COUPLING**
- Carry out external cleaning of equipment.
- Check all holding down bolts for tightness and take corrective action if required.
- Check lubricating oil level, if low top-up with Turbinol-32/Servo Prime-32.
- Cleaning of suction strainer of BFP and Booster pump.
- Check for oil leakages if any arrest it either by welding/replacement of gland/gaskets.
- Check for mechanical seal leakage, if it is beyond permissible limit, take equipment isolation and attend the leakage, if possible by lapping of seal components.
- Attending leakage of Booster Pump Mechanical seals either by if possible by lapping of seal components or replacement of mechanical seal or by replacing the defective part.
- Inspection / Replacement / Servicing of Booster Pump DE/NDE bearings and thrust pads.
- Inspection / Servicing of Lubricating Oil Pump.
- Clean the lube oil filter.
- Clean the magnetic filters.
- Check for lubricating oil is flowing freely through the boosters pump DE and NDE bearing drain flow.
- Check for lubricating oil is flowing freely through the BP side and HC side driven motor bearing drain flow.
- Check for lubricating oil is flowing freely through the feed pump/Motor/Booster Pump DE and NDE bearing drain flow.
- Check that the clarified cooling water from the booster pump mechanical seals is flowing freely through the flow indicators.
- Check for joints and valve glands for leakages, if any arrest it either by tightening or by replacing the glands.
- Attend all oil & water leakages
- Checking of alignment of BFP to Hydraulic coupling, Hydraulic coupling to Motor and Motor to Booster Pump and do the necessary correction if required.
- Cleaning of BFP & Booster pump suction strainer against routine defects
- Top up of oil in BFP Hydraulic coupling as and when required.
- Replacement of Hydraulic Coupling fusible plugs.
- Inspection / Replacement of Hydraulic Coupling journal bearings.
- Cleaning of Duplex filters.
- Cleaning of Mechanical seal coolers of BFP.
- Cleaning of lube oil coolers / working oil coolers.
- Centrifuging of Hydraulic coupling oil as and when required.
- Attending of flange leakage and all union leakages.
- Attending any impulse line leakage either by welding or by tightening.
- Attending of gland leakages of Booster Pump suction valve, BFP discharge valve, Balancing valve, recirculation valve, Discharge NRV, Recirculation isolation valve, attending leakage from orifice flange and Recirculation NRV.
- Cleaning and painting of all these equipments and pipelines as per instruction of EIC.
- Painting should be carried out with spray painting gun and kit should be kept ready all the time.
- Supporting C&I and electrical team as per requirement and instruction of EIC. Jobs such as decoupling of motor, welding arrangement and mechanical arrangements needed to support electrical and C&I team.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.
- Carry out cooler repair/replacement as per requirement
- Carry out gear replacement.
- Carry out mechanical seal replacement.
- Carry out servicing of Hydraulic Coupling
- Carry out cleaning of hydraulic coupling oil tank.
- Carry out cleaning of hydraulic coupling oil drain pit.
- Cleaning of equipment and associated systems to be carried out in every PM.
- Cleaning and painting of equipment and associated systems to be carried out in every overhauling.

**MAINTENANCE OF VALVES / NRV’S**

- Attending gland leakages either by tightening or by replacing the glands.
- Hot tightening of gland nuts.
- Greasing of valves of all sizes as per requirement.
- Attending flange / Bonnet leakages either by tightening or by replacing the gasket / seal ring.
- Hot tightening of flange or bonnets.
- Removal / re-fixing of cladding / insulation required for completion above job.
- Repair/Replacement of Valves as per requirement.
- Replacement of valves as per instruction of EIC.
- Attending the problem valve mechanical jamming.
- Welding of handles / putting new handles to the valve.
- Repair and revival of damaged valves/ parts of valves such as discs, spindles, bonnets etc.
- Leakage attending of Gauge glasses of De-aerator, HP Heaters, LP Heaters & Tubular gauge Glasses.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.
- Cleaning of equipment and associated systems to be carried out in every PM.

**TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS**
MAINTENANCE ON CRANE / MONORAIL TROLLEYS / CHAIN PULLEY BLOCKS
- Lubricate the bearing with grease.
- Check the condition of coupling bushes.
- Check the break adjustment / liner condition.
- Lubricate the wire rope with cardium compound.
- Check the foundation/structural bolt tightness.
- Checking of coupling spiders, replacement if required.
- Check the oil level if level is low top-up.
- Assisting and carrying out load test of the above as per the Load testing schedule.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.
- Cleaning of equipment and associated systems to be carried out in every PM.
- Cleaning and painting of equipment and associated systems to be carried out in every overhauling.

MAINTENANCE ON EOT OF TURBINE HALL
- Greasing of bearings.
- Check the oil level of thruster brake, if low top-up with transformer oil.
- Lubrication of rope with cardium compound/servo coat.
- Check the brake adjustment / liner condition.
- Check the foundation bolt tightness.
- Checking of coupling spiders, replacement if required.
- Check the rail alignment and holding down bolts of rail.
- Repair/Replacement/Routine Maintenance of LT/CT Gearbox
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.
- Assisting and carrying out load test of the above as per the Load testing schedule.
- Cleaning of equipment and associated systems to be carried out in every PM.
- Cleaning and painting of equipment and associated systems to be carried out in every overhauling.

MAINTENANCE OF CONDENSATE EXTRACTION PUMP
- Carry out external cleaning of equipment.
- Check all joints & Valve Glands for leakages, if leakage is to be observed, same to be attended either by replacing the glands or by tightening it.
- Check all holding down bolts for tightness and take corrective action if required.
- Check thrust bearing oil level in the thrust bearing gauge glass, if level is low top-up with oil.
- Check the tightness of coupling bolts.
- Attend all leakages/air ingress either by welding/replacement of gland/gaskets.
- Check for pump mechanical seal, if leakage is to be observed, same to be attended either by replacing the seal or servicing it.
- Checks the alignment of Pump with respect to Motor, and do the necessary correction if required.
- Cleaning of suction strainers
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.
- Cleaning of equipment and associated systems to be carried out in every PM.
Cleaning and painting of equipment and associated systems to be carried out in every overhauling.

**MAINTENANCE OF VACUUM PUMP**
- Carry out external cleaning of equipment.
- Check all valves for gland leakage if leakage is to be observed, same to be attended either by replacing the glands or by tightening it.
- Check the foundation bolt tightness and take corrective action if required.
- Check for pump gland leakage, if leakage is observed, same to be attended either by replacing the glands or by tightening it.
- Inspection of bearings of Pump.
- Clean strainers for makeup water & seal liquid line.
- Servicing of separator tank make up water line valve.
- Bearing greasing to be done.
- Attend all leakages either by welding/replacement of gland/gaskets.
- Cleaning of seal water coolers.
- Checking of coupling spider and replacement if required.
- Checking of alignment of Pump with Motor and do the necessary correction if required.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.
- Cleaning of equipment and associated systems to be carried out in every PM.
- Cleaning and painting of equipment and associated systems to be carried out in every overhauling.

**MAINTENANCE OF CONDENSER ON LINE TUBE CLEANING SYSTEM**
- Carry out external cleaning of equipment.
- Check all joints for leakages if any arrest it either by tightening or by replacing the glands.
- Check all holding down bolts for tightness & take corrective action if required.
- Check coupling spider for damage, if necessary replace it.
- Check the recirculation pump oil level, if level is low top-up.
- Attend all leakages either by welding/replacement of gland/gaskets.
- Repair/Replacement of Pump/ Replacement of bearings.
- Maintenance of DP flushing line/ Ball separator screens/Suction / Discharge valves of ball vessels.
- Check gland leakages if any arrest it if leakage is to be observed, same to be attended either by replacing the glands or by tightening it.
- Checking of alignment of Pump with Motor and do the necessary correction if required.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.
- Cleaning of equipment and associated systems to be carried out in every PM.
- Cleaning and painting of equipment and associated systems to be carried out in every overhauling.

**MAINTENANCE ON GSC FANS**
- Carry out external cleaning of equipment.
- Check all joints for leakages if any arrest it.
- Check all holding down bolts for tightness and take corrective action if required
- Attend all leakages either by welding/replacement of gland/gaskets.
- Repair/Replacement of fans/Replacement of Impeller.
- In case of unbalance, necessary in-situ balancing to be done.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.
- Cleaning of equipment and associated systems to be carried out in every PM.
- Cleaning and painting of equipment and associated systems to be carried out in every overhauling.

**MAINTENANCE ON ICW PUMP**
- Carry out external cleaning of equipment.
- Check all joints for leakages if any arrest it.
- Check all foundation bolts for tightness and take corrective action if required
- Attend all leakages either by welding/replacement of gland/gaskets.
- Repair/Replacement of Pump Internals as per requirement.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.
- Cleaning of equipment and associated systems to be carried out in every PM.
- Cleaning and painting of equipment and associated systems to be carried out in every overhauling.

**HP/LP HEATERS MAINTENANCE**
- Carry out external cleaning of equipment.
- Check all joints for leakages if any arrest it.
- Check all foundation bolts for tightness and take corrective action if required
- Replacement of Gaskets/pressure seals to be done as per requirement.
- All flange bolt/stud tightness to be checked/corrective actions to be done/ replacement to be done as per requirement.
- All flanges/pipelines/valves of level indicators/tyra step/ Level pots /drains etc.. to checked & corrective actions to taken as per requirement.
- Checking of all safety valves, pressure setting to be done as per SMP manual.
- Spill over water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.
- Cleaning of equipment and associated systems to be carried out in every PM.
- Cleaning and painting of equipment and associated systems to be carried out in every overhauling.

**MAINTENANCE OF LP DRAIN PUMP (DRIP PUMP)**
- Carry out external cleaning of equipment.
- Check all joints for leakages if any arrest it.
- Check all foundation bolts for tightness and take corrective action if required
- Repairing/Replacement of mechanical seal
- Spill over water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.
- Cleaning of equipment and associated systems to be carried out in every PM.
- Cleaning and painting of equipment and associated systems to be carried out in every overhauling.

**MAINTENANCE OF CEP PIT SUMP PUMP**
- Carry out external cleaning of equipment.
- Check all joints for leakages if any arrest it.
- Check all foundation bolts for tightness and take corrective action if required
- Repairing/Replacement of damage components.
- Spill over water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.
- Cleaning of equipment and associated systems to be carried out in every PM.

**TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS**
Cleaning and painting of equipment and associated systems to be carried out in every overhauling.

MAINTENANCE OF ICW AND S&M LINE STRAINERS
- Carry out external cleaning of equipment.
- Check all joints for leakages if any arrest it.
- Check all bolts for tightness and take corrective action if required
- Repairing/Replacement of damage components such as gland seal etc.
- Carry out complete cleaning of filter element/mesh as per instruction of EIC.
- Spill over water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.
- Cleaning of equipment and associated systems to be carried out in every PM.
- Cleaning and painting of equipment and associated systems to be carried out in every overhauling.

MAINTENANCE OF GENERATOR COOLER, BFP LUBRICATING OIL COOLER, BFP WORKING OIL COOLER, BFP AND BOOSTER PUMP MECHANICAL SEAL COOLER
- Dismantling of end covers
- Internal and external cleaning of tubes and shell
- Hydro jetting of tubes for effective cleaning of tubes internal
- Box up of end cover after inspection of EIC and operation team
- Necessary clearance for box should be taken from EIC
- Hydro testing of each shell for identifying tube leakage
- Blanking of defective tubes through plugging
- Cross verification through hydro test
- Complete box up of cooler
- External cleaning and painting of shell covers as per instruction of EIC
- Replacement of damage valves and piping of generator cooler
- Removal of scrap and unwanted items from work location
- Painting should be carried out with spray painting gun and kit should be kept ready all the time.
- Supporting C&I and electrical team as per requirement and instruction of EIC. Jobs such as welding arrangement and mechanical arrangements needed to support electrical and C&I team.
- Hydro jet machine and one gang for cooler cleaning should be kept ready.
- Cleaning of equipment and associated systems to be carried out in every PM.
- Cleaning and painting of equipment and associated systems to be carried out in every overhauling.

MISCELLANEOUS PREVENTIVE MAINTENANCE
- Maintaining and up-keeping of site stores, which includes fabrication of racks, shelves, shifting of material required for stores from Central stores to Site stores, etc.
- Local store record keeping to be done, local store to be maintained as per instructions of EIC.
- Removal, replacement / rectification of gratings, hand rails, staircases, etc.
- Preparation of scaffolding required for on line leak sealing and other Misc work.
- Identification of leakages by removal of insulation.
- Assistance in taking oil samples from Turbine bearing pedestals / MOT hydraulic Coupling / Fresh oil drum.
- Centrifuging / filtration of BFP / HP Bypass/ LP Bypass system oil by portable centrifuge / filtration unit.
- Repair / revival of damaged assemblies such as mechanical seal assemblies, Dosing pumps, Dewatering pumps actuators, seal oil / leak oil / clean oil pumps etc.

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
Any type of minor modification & repair work such as provision of hand rails, minor fabrication, and platform fabrication work will be treated as routine work.

Replacement of rupture diaphragms of LPT diaphragm at the time of black out and attending oil leakages if any and when required from TG proper oil lines.

All pipelines and its fittings leakages to be arrested either by replacing it or by doing online sealing.

Contractor will perform online sealing either by on its own or by giving further subcontracting whose cost shall be borne by contractor itself.

Decoupling, Shifting to maintenance bay and reinstall with alignment of all HT Motors

Decoupling of all LT Motors

Cooler cleaning of all Motors

Repair of insulation and sheet.

Replacement of HP/LP Heaters Gasket

Cleaning of equipment and associated systems to be carried out in every PM.

Cleaning and painting of equipment and associated systems to be carried out in every overhauling.

Back flushing of strainers and coolers in opportunities

Conducting condenser and associated system flood test in opportunities

Air cleaning and drying of condenser

Tube plugging of condenser

Fixing of sacrificial anodes in condenser water box

Alignment of all sizes motors

Cleaning of BFP, CEP and drip pump pits

Servicing of condenser online tube cleaning system

PREVENTIVE & ROUTINE MAINTENANCE OF BALANCE OF PLANT EQUIPMENTS

AREAS COVERED UNDER BALANCE OF PLANT

Main plant compressor house

ESP bag filter compressor house

Refrigeration and chiller house

All Air handling units and evaporative cooling units installed throughout the plant

Fuel handling, unloading, transfer and supply pump house (HFO, LDO and diesel unloading, transfer and supply pump houses)

HFO storage tanks, LDO storage tanks and diesel storage tanks and their support systems

Dirty oil pit and accessories

DM plant from aerator to DM feed water lines to main plant

Portable water pump house and it’s piping system throughout the plant

Fire water pump house and it’s piping system throughout the plant

Cooling towers and their basins including screens and hoists

CW pump house and screens

Service and make up water pump house

HCL and NAOH Unloading and transfer system including storage tanks, pumps and piping’s

H2SO4 unloading and transfer system including storage tanks, pumps and piping’s

Coal sampling station, Jaw crusher unit and it’s accessories

Coal sampling unit installed at weigh bridge of material entry gate of plant-II (AUGER coal sampling unit)

Safety showers and it’s piping throughout the plant

SWAS System (Steam and water analysis system), it’s pumps, chemical storage tanks, valves, piping’s and cooling system (Heat exchangers and pumps) of the same

Phosphate, Hydrazine, PAC (Poly alum chloride) and ammonia dosing system
Effluent treatment plant
Sewage treatment plant
Zero discharge system

MAINTENANCE OF COMPRESSIONS AND ACCESSORIES

MAINTENANCE OF MAIN PLANT SCREW COMPRESSOR
- Carry out external cleaning of equipment.
- Check the oil level in the tank if low top-up with oil.
- Change the lube oil & lube oil filter element.
- Check the tightness of foundation bolt & take corrective action if required.
- Check the coupling gear installed between compressor and motor if found damaged then replace and realign to be done.
- Check & clean the air breather in oil tank.
- Clean the inlet air filter element and replacement on need basis.
- Checking / cleaning of all heat exchangers (including hydro testing).
- Checks the leakage in oil line, water line and air line if found then rectify the same.
- Cleaning of cooling water inlet line strainer, back flushing of air and oil cooler, air purging oil scavenging & connecting tube, Cleaning & servicing of moisture separator installed at compressor outlet, cleaning & replacement of all moisture & dust separating filter elements during every PM.PM checklist and SMP to be followed strictly.
- Assisting for inspection / repair / servicing during expert visit as per instructions.
- Overhauling of compressor unit as per schedule and requirement. Overhauling to be carried out as per given check list and SMP. In case of any decision making, instruction of EIC to be followed.
- Contractor has to maintain the records of PM and overhauling activities with dates. Reports needs to be circulated every month.
- CBM observations and necessary corrections need to be carried out as per requirement. Equipment should be operated at normal vibration levels as per ISO norms. Any deviation in vibration levels should be addressed immediately and corrections to be done on priority.
- Take trial run for smooth operation.
- Equipment external and internal cleaning to be done during every PM.
- Equipment painting to be done during every overhauling.
- Alignment corrections and mounting pads replacement to be carried out as per requirement.
- Motor decoupling and coupling to be carried out as per requirement.
- Replacement of air-end and its accessories is in service provider’s scope.
- Assistance to be given to C&I and electrical department as per requirement and instruction of EIC.

Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF MAIN PLANT AIR DRIER
- Carry out external cleaning of equipment.
- Clean the suction filter/ moisture strainer.
- Check the tightness of foundation bolts & take corrective action if required.
- Assisting for inspection / repair / servicing during expert visit as per instructions.
- Filling of alumina balls as per requirement.
- Check change over valve & replace if required.
- Check for any leakages in pipeline.
- Take trial run for smooth operation.
- Assistance to be given to C&I and electrical department as per requirement and instruction of EIC.

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
Equipment external and internal cleaning to be done during every PM.
Equipment painting to be done during every overhauling.
Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF MAIN PLANT CENTRIFUGAL COMPRESSOR
- Carry out external cleaning of equipment.
- Check the oil level in the tank if low top-up with oil.
- Change the lube oil & lube oil filter element.
- Check the tightness of foundation bolt & take corrective action if required.
- Check & clean the air breather in oil tank.
- Clean the inlet air filter element and replacement on need basis.
- Checking / cleaning of all heat exchangers (including hydro testing).
- Checks the leakage in oil line, water line and air line if found then tighten the same.
- Assisting for inspection / repair / servicing during expert visit as per instructions.
- Take trial run for smooth operation.
- Motor decoupling and coupling to be carried out as per requirement
- Replacement of impellers and its accessories is in service provider’s scope.
- Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
- Equipment external and internal cleaning to be done during every PM.
- Equipment painting to be done during every overhauling.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.
- Check cooling water pump, strainer, coupling & its pipeline.

MAINTENANCE OF MAIN PLANT CENTRIFUGAL COMPRESSOR AIR DRIER
- Carry out external cleaning of equipment.
- Check the tightness of foundation bolts & take corrective action if required.
- Assisting for inspection / repair / servicing during expert visit as per instructions.
- Checking/ cleaning of heat exchangers.
- Replacement of silica gel as per requirement
- Take trial run for smooth operation
- Motor decoupling and coupling to be carried out as per requirement
- Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
- Equipment external and internal cleaning to be done during every PM.
- Equipment painting to be done during every overhauling.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF ESP BAG FILTER SCREW COMPRESSOR
- Carry out external cleaning of equipment.
- Check the oil level in the tank if low top-up with oil.
- Change the lube oil & lube oil filter element.
- Check the tightness of foundation bolt & take corrective action if required.
- Check the coupling installed between compressor and motor if found damaged then replace and realignment to be done.
- Check & clean the air breather in oil tank.
- Clean the inlet air filter element and replacement on need basis.
Checking / cleaning of all heat exchangers (including hydro testing).
Checks the leakage in oil line, water line and air line if found then tighten the same.
Cleaning of cooling water inlet line strainer, back flushing of air and oil cooler, air purging oil scavenging & connecting tube, Cleaning & servicing of moisture separator installed at compressor outlet, cleaning & replacement of all moisture & dust separating filter elements during every PM.
Assisting for inspection / repair / servicing during expert visit as per instructions.
Take trial run for smooth operation.
Motor decoupling and coupling to be carried out as per requirement
Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
Equipment external and internal cleaning to be done during every PM.
Equipment painting to be done during every overhauling.
Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF ESP BAG FILTER AIR DRIER
Carry out external cleaning of equipment.
Clean the suction filter/ moisture strainer.
Check the tightness of foundation bolts & take corrective action if required.
Assisting for inspection / repair / servicing during expert visit as per instructions.
Inspection of rectification of refrigerant leakage in the system.
Identifying leakages in dryer and refrigeration unit.
Drying of dryer internal parts through inert gas filling (N2 Gas).
Vacuum test and filling of refrigerant gas as per requirement.
Checking/ cleaning of heat exchangers.
Hydro testing of heat exchangers and plugging of tubes.
Take trial run for smooth operation.
Assistance to be given to C&I and electrical department as per requirement and instruction of EIC.
Equipment external and internal cleaning to be done during every PM.
Equipment painting to be done during every overhauling.
Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF HEATING, VENTILATION AND AIR CONDITIONING UNITS AND ASSOCIATED SYSTEMS

MAINTENANCE OF REFRIGERATION STATION
Maintenance and overhauling of all mechanical equipment, associated pipelines, valves and accessories of refrigeration station.
Carry out external cleaning of equipment.
Check the tightness of foundation bolts & take corrective action if required.
Assisting for inspection / repair / servicing during expert visit as per instruction of EIC.
Inspection of rectification of refrigerant leakage in the system.
Identifying leakages in chiller unit.
Drying of chiller internal parts through inert gas filling (N2 Gas).
Vacuum test and filling of refrigerant gas as per requirement.
Checking/ cleaning of heat exchangers.
Hydro testing of heat exchangers and plugging of tubes.
Maintenance of associated valves and pipelines of the system.
PM to be carried out as per given SMP and checklist.

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
MAINTENANCE OF AIR HANDLING UNIT
- Carry out external and internal cleaning of equipment.
- PM to be carried out as per given SMP and checklist
- Removal, shifting and cleaning of suction filter elements through compressed air
- Cleaning and replacement of fills
- Maintenance of associated valves and pipelines of the system
- Overhauling of pump, blower and replacement of damage parts as per instruction of EIC
- Overhauling to be carried out as per given SMP and checklist
- Motor decoupling and coupling to be carried out as per requirement
- Checking of blower, V belts, Pulley, Nozzle, Clamp, pumps, filters and replacement of the same if required.
- Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
- Equipment external and internal cleaning to be done during every PM.
- Equipment painting to be done during every overhauling.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF EVAPORATIVE COOLING UNIT
- Carry out external and internal cleaning of equipment.
- PM to be carried out as per given SMP and checklist
- Removal, shifting and cleaning of suction filter elements through compressed air
- Cleaning and replacement of fills
- Maintenance of associated valves and pipelines of the system
- Overhauling of pump, blower and replacement of damage parts as per instruction of EIC
- Overhauling to be carried out as per given SMP and checklist
- Motor decoupling and coupling to be carried out as per requirement
- Checking of blower, V belts, Pulley, Nozzle, Clamp, pumps, filters and replacement of the same if required.
- Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
- Equipment external and internal cleaning to be done during every PM.
- Equipment painting to be done during every overhauling.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF HVAC SYSTEM DUCTING
- Internal and external cleaning of ducts
- Identification of leakage points and correction of the same
- Inspection, repair and replacement of support and hangers
- Inspection, repair and replacement of insulation and cladding
- Inspection, repair and replacement of duct plate
Inspection, repair and replacement of duct joints and bellows.

**MAINTENANCE OF FUEL UNLOADING, HANDLING, TRANSFER AND SUPPLY SYSTEM (HFO, LDO AND DIESEL)**

**MAINTENANCE OF FOPH UNLOADING PUMPS AND ASSOCIATE SYSTEMS**

- Maintenance and overhauling all pumps and associated systems.
- Carry out external cleaning of equipment.
- Cleaning of suction strainer, replacement if required.
- Checking and Servicing of water thrower valve.
- Checking and tightening of coupling bolts/Spider, replacement if required.
- Checking and tightening of foundation bolts.
- PM to be carried out as per given SMP and checklist
- Overhauling of equipments and associated system as per given SMP and checklist.
- Maintenance of associated valves and pipelines of the system
- Overhauling of pump and replacement of damage parts as per instruction of EIC
- Overhauling to be carried out as per given SMP and checklist
- Checking of coupling alignment and required corrections to be done.
- Checking of mechanical seal, if found leaking, servicing/lapping/adjustment to be done or replacement to be done as per requirement.
- Checking and inspection of timing gears and replacement of timing gear box oil.
- Checking and tightening of all connecting flanges and joints.
- Motor decoupling and coupling to be carried out as per requirement
- Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
- Equipment external and internal cleaning to be done during every PM.
- Equipment painting to be done during every overhauling.
- Take trial run for smooth operation.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

**MAINTENANCE OF FOPH OIL SUPPLY/TRANSFER PUMPS**

- Carry out external cleaning of equipment.
- Checking of foundation blot of pumps and its tightening if required.
- Cleaning of suction strainers of HFO/LDO supply pumps and its replacement if necessary.
- Check for oil leakages through pumps, flanges seals etc and arresting the leakages by replacing/tightening seals.
- Pump and motor replacement if necessary.
- Checking spider and alignment checking of motor and pump in monthly basis.
- Cleaning/replacement of discharge filters.
- Repair/Replacing of Pressure control/regulator valves.
- Mechanical seal/oil seal leakage arresting either by replacing whole part or by replacing defective part as per instruction of EIC.
- Attending steam/oil leakages from associated pipelines and valves.
- Motor decoupling and coupling to be carried out as per requirement
- Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
- Equipment external and internal cleaning to be done during every PM.
- Equipment painting to be done during every overhauling.

**TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS**
TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS

- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF HFO, LDO AND DIESEL TANK
- Internal and external cleaning of tank
- Identification of leakage points and correction of the same
- Inspection, repair and replacement of supports and railings
- Inspection, repair and replacement of insulation and cladding
- Inspection, repair and replacement of tank body
- Inspection, repair and replacement of associated valves and piping’s
- Painting of tank body, railing, pipeline and valves as per instruction of EIC.

MAINTENANCE OF DIRTY OIL PIT
- Draining of pit by using suitable dewatering pump.
- Removal of sludge/mud from the pit.
- Cleaning of pit.
- Checking foundation of pump and its coupling.
- Checking and arresting any steam/water/oil leakages in pumps and associated pipelines and valves if any.
- Periodic cleaning of air breather.
- Replacement/repair of pumps as if needed.

MAINTENANCE OF DM PLANT AND IT’S AUXILIARIES
- Maintenance of all mechanical equipments pumps, blowers, DM water production unit and associated system.
- Preventive maintenance and overhauling of all mechanical equipments and associated systems.
- PM and overhauling to be carried out as per given SMP and checklist.

MAINTENANCE OF CENTRIFUGAL PUMPS OF DM PLANT
- Cleaning of equipment.
- Checking of foundation bolt and tightening.
- Checking and arresting any leakages from pump body/gland/valve body/pipeline flange etc by replacing packing or gaskets.
- Checking of rubber spider and alignment as per PM schedule.
- PM to be carried out as per given SMP and checklist.
- Maintenance of associated valves and pipelines of the system.
- Overhauling of pump and replacement of damage parts as per instruction of EIC.
- Overhauling to be carried out as per given SMP and checklist.
- Motor decoupling and coupling to be carried out as per requirement.
- Arresting leakages from pipelines and valves including underground piping.
- Necessary arrangements for excavation of underground piping should be done.
- Replacement of pipeline and valves as per requirement.
- Assistance to be given to C&I and electrical department as per requirement and instruction of EIC.
- Equipment external and internal cleaning to be done during every PM.
- Equipment painting to be done during every overhauling.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.
PREVENTIVE MAINTENANCE OF CHEMICAL PUMPS OF DM PLANT

- All Preventive maintenance of HCL / NaOH / H2SO4/ and misc dozing pumps of DM plant.
- Arresting any leakages from pump body/pipe line flanges/tanks gauge glass/and fittings.
- PM to be carried out as per given SMP and checklist
- Maintenance of associated valves and pipelines of the system
- Overhauling of pump and replacement of damage parts as per instruction of EIC
- Overhauling to be carried out as per given SMP and checklist
- Ensuring healthiness of accidental eye wash system.
- Replacement of pumps if required.
- Checking for gland leakages and arresting it by tightening or replacing packing.
- Protective coating /lining in pump body/valves and pipelines if required.
- Replacement of pipelines & valves if required.
- Cleaning of tanks and protective coating /lining to be done.
- Motor decoupling and coupling to be carried out as per requirement
- Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
- Equipment external and internal cleaning to be done during every PM.
- Equipment painting to be done during every overhauling.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF AERATOR

- Internal and external cleaning of aerator tank as per requirement
- Dewatering of basin by using suitable dewatering pump
- Cleaning of basin and removal of mud/sludge
- Scrapping of algae and cleaning of the same
- Maintenance of valves and associated pipelines with aerator.
- Arresting leakages from pipelines and valves including underground piping
- Necessary arrangements for excavation of underground piping should be done
- Replacement of pipeline and valves as per requirement
- Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
- Equipment external and internal cleaning to be done during every PM.
- Equipment painting to be done during every overhauling.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF CLARIFIER

- Dewatering of basin by using suitable dewatering pump.
- Cleaning of basin and removal of mud/sludge.
- Servicing/replacement of mud pumps.
- Maintenance of associated valves and pipelines of the system.
- Routine maintenance of Agitator
- Overhauling of clarifier unit as per schedule and requirement
- Overhauling to be carried out as per SMP and checklist. Instruction of EIC must be followed.
- Arresting leakages from pipelines and valves including underground piping
- Necessary arrangements for excavation of underground piping should be done
- Replacement of pipeline and valves as per requirement
- Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
- Equipment external and internal cleaning to be done during every PM.

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
➤ Equipment painting to be done during every overhauling
➤ Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF RESERVOIRS AND FILTERS
➤ Draining of reservoir/filter tank by using suitable dewatering pump.
➤ Removal of mud/sludge from the reservoir.
➤ Cleaning/replacing of screen filter element as required or instructed.
➤ Refilling of tank/reservoir.
➤ Maintenance of valves and pipelines associated with tank/reservoir

MAINTENANCE OF CIRCULATING WATER SYSTEM, ASSOCIATED PIPINGS AND VALVES

MAINTENANCE OF CW PUMP
➤ Carry out external cleaning of equipment.
➤ Check the oil level of pump motor thrust bearings if low top-up with suitable oil or equivalent grade of oil.
➤ Check the tightness of foundation bolt & take corrective action if required.
➤ Check the tightness of coupling bolt & take corrective action if required.
➤ Check the gland packing if excessive water, if found arrest it either by tightening or by replacing the glands.
➤ Check the alignment of pump & motor and take corrective action
➤ Check the flow of water through thrust bearing cooler if interruption noticed flush the water line or take corrective action.
➤ Check for any oil / water leakages from valves, flanges etc if noticed take corrective action for arresting the leakages.
➤ Clean the trash rack screen/Strainers, if found damaged, replace / repair the same.
➤ Greasing of stop log gates & associated valves in CW System.
➤ Assisting during underwater services of CW Pump, including arrangement of divers etc.
➤ Removal of grating & fixing the same.
➤ Checking, inspection and maintenance of rotary screen cleaning system.
➤ PM of CW pump and rotary screen system as per schedule.
➤ PM to be carried out as per given SMP and checklist
➤ Overhauling of CW pump screen as per given SMP and checklist
➤ Take trial run for smooth operation.
➤ Motor decoupling and coupling to be carried out as per requirement
➤ Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
➤ Equipment external and internal cleaning to be done during every PM.
➤ Equipment painting to be done during every overhauling.
➤ Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF CW PUMP’S DISCHARGE VALVE AND ITS HYDRAULIC SYSTEM
➤ PM of hydraulic system of CW Pump discharge valve
➤ Oil level checking and top up as per requirement
➤ Checking and CBM of hydraulic pump as per schedule
➤ Necessary corrections to be carried out in pump internals and it’s base as per requirement
➤ Replacement of pump and it’s parts as per requirement
➤ Overhauling of pump and associated piping’s

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
PM to be carried out as per given SMP and PM check list
Overhauling of hydraulic system as per given SMP and check list
Replacement of oil and cleaning of tank
Setting of PRVs, dump valves and flow control valves for line pressure adjustment
Replacement of hydraulic hoses and cylinder seal kit as per requirement
Trial to be taken and in case of malfunctioning or jamming of valve, necessary corrections to be done
Motor decoupling and coupling to be carried out as per requirement
Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
Equipment external and internal cleaning to be done during every PM.
Equipment painting to be done during every overhauling.
Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF SIDE STREAM FILTERS (SSF)
PM and overhauling of side stream filter units, pumps and associates accessories
PM and overhauling to be carries out as per given SMP and checklists
Replacement of fiber media and resins of side stream filters
Replacement of pumps and associated accessories
CBM of equipments and necessary corrections as per requirement
Trial to be taken and in case of malfunctioning or jamming of valve, necessary corrections to be done
Motor decoupling and coupling to be carried out as per requirement
Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
Equipment external and internal cleaning to be done during every PM.
Equipment painting to be done during every overhauling.
Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF COOLING TOWER & ITS ACCESSORIES
Carry out external cleaning of equipment.
Check the oil level of gear box if low top-up with oil.
Check the oil leakage in gear box & local level glass if leakage found then take corrective action.
Check the tightness of foundation bolt gear box & take corrective action if required.
Check the tightness of coupling bolt & take corrective action if required.
Check the tightness of U bolt in between fan blade & gear box if loose then tighten.
Check the alignment of gear shaft & motor and take corrective action
Check & adjust the pitch angle of fan blade.
Check and clean the all pipe nozzles and clean other debris inside the cooling tower cell.
Check the tightness of bolts in all flanges joint if loose then tighten and attend all leakages.
Check the riser pipe valve if jam then repair the same.
Clean the trash rack screen in cooling tower if damaged replace / repair the same.
Check the tightness of bolts in gear box cover & take corrective action if required.
Check the fill pack position if found disturbed then align it to original position.
Check the drift eliminator position if found disturbed then align it to original position.
Check the leakage from PVC pipe inside the cooling tower if so then attend & realign the same.
Removal of grating & fixing the same.
Greasing of associated valves in Cooling tower System.

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
- Assisting during underwater services of cooling tower basin etc.
- Float and backlash checking for gear sets, blue matching check for gear set, alignment reading checks for all coupling locations, in case of deviation found, necessary corrections to be done.
- PM of cooling tower shell including fan, gear box, drift eliminator inspection/replacement, fills element inspection/replacement, concrete header inspection, distribution header inspection/replacement, spray nozzle and diffuser inspection/replacement
- PM to be carried out as per given SMP and checklist
- Take trial run for smooth operation.
- Motor decoupling and coupling to be carried out as per requirement
- Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
- Equipment external and internal cleaning to be done during every PM.
- Equipment painting to be done during every overhauling.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.
- Routine Maintenance of CT fan Gearbox.

MAINTENANCE OF VALVES / NRVS / BUTTERFLY VALVES / AIR RELEASE VALVES / RUBBER EXPANSION JOINTS & ACTUATORS
- Carry out the external and internal cleaning
- Attending gland leakages either by tightening or by replacing the glands
- Attending flange / Bonnet leakages either by tightening or by replacing the gasket / seal ring
- Attending the problem of valve’s mechanical jamming
- Attending water leakage from Hydrant pipe under & above ground line either by replacement of pipe line or by repair welding
- Attending oil leakage from actuators / expansion joint and topping up oil
- Greasing of valves & oil top up in actuators of all sizes as per requirement. (Half Yearly)
- Adjust the setting of rubber expansion joints.
- Welding of handles / putting new handles to the valve.
- Replacement of valves such as Hydrant angle valve, alarm valve and deluge valve against routine defects.
- Repair and revival of damaged valves/ parts of valves such as discs, spindles, bonnets etc.
- Removal of grating & fixing the same.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.
- Equipment external and internal cleaning to be done during every PM.
- Equipment painting to be done during every overhauling.

MAINTENANCE OF FIRE FIGHTING SYSTEMS

MAINTENANCE OF FIRE WATER PUMP
- Carry out internal and external cleaning of equipment.
- Check the oil level if low top-up with oil.
- Check the tightness of foundation bolt if loose then tighten.
- Check the tightness of coupling bolt if loose then tighten.
- Check the gland packing for excessive water leakage, if found arrest it either by tightening or by replacing the glands.
- Check the alignment of pump & motor and take corrective action.
- Check the tightness of bolts in all flanges joint if loose then tighten.
➢ Check the flow of water through thrust bearing cooler if interrupt noticed flush the water line or take corrective action.
➢ Check the tightness of bolts in all flanges joint if loose then tighten and attend all leakages.
➢ Removal of grating & fixing the same.
➢ Clean the strainers if damaged replaced / replaced the same.
➢ Take trial run for smooth operation.
➢ Motor decoupling and coupling to be carried out as per requirement
➢ Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
➢ Equipment external and internal cleaning to be done during every PM.
➢ Equipment painting to be done during every overhauling.
➢ Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF JOCKEY PUMP
➢ Carry out external cleaning of equipment.
➢ Check the tightness of foundation bolt if loose then tighten.
➢ Check the tightness of coupling bolt if loose then tighten.
➢ Check the gland packing for excessive water, if found arrest it either by tightening or by replacing the glands.
➢ Check the alignment of pump & motor and take corrective action
➢ Check the tightness of bolts in all flange joints if loose then tighten and attend all leakages.
➢ Removal of grating and fixing the same.
➢ Clean the thrash rack strainer if damaged replaced / repaired the same
➢ Take trial run for smooth operation.
➢ Motor decoupling and coupling to be carried out as per requirement
➢ Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
➢ Equipment external and internal cleaning to be done during every PM.
➢ Equipment painting to be done during every overhauling.
➢ Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF DIESEL ENGINE FOR FIRE WATER PUMP
➢ Carry out external cleaning of equipment.
➢ Check the Lubricating oil level if low top-up with approve brand of oil
➢ Check the tightness of foundation bolt if loose then tighten the same.
➢ Check the coupling in between engine and pump if found damaged then replace and realignment to be done
➢ Check the radiator water level if top up with water.
➢ Check the tightness of radiator fan belt.
➢ Clean the inlet air filter element if damaged replaced the same.
➢ Check for any leakage in oil, diesel & water system if found then tighten the same.
➢ Clean / check the lube oil filter element.
➢ Change the lube oil & lube oil filter element. Thoroughly soak the density type strainer element in clean fuel oil before installing.
➢ Change the diesel filter element.
➢ Take trial run for smooth operation.
➢ Motor decoupling and coupling to be carried out as per requirement
➢ Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
Equipment external and internal cleaning to be done during every PM.
Equipment painting to be done during every overhauling.
Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF BOOSTER PUMP FOR FIRE WATER SYSTEM
- Carry out external cleaning of equipment.
- Check the condition of the coupling and spider if broken then replace the same.
- Check the gland leakage if heavy then tightens or replace the gland packing.
- Check the tightness of foundation bolt if loose then tighten the same.
- Check the coupling in between engine and pump if found damaged then replace and realignment to be done
- Carry out pump bearing greasing.
- Take trial run for smooth operation.
- Motor decoupling and coupling to be carried out as per requirement
- Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
- Equipment external and internal cleaning to be done during every PM.
- Equipment painting to be done during every overhauling.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF HYDRANT VALVES / MONITORS / ALARM VALVES / DELUGE VALVES / GATE VALVES ETC. FOR FIRE WATER SYSTEM
- Carry out the external cleaning of valves.
- Attending gland leakages either by tightening or by replacing the gland / rubber seat / hand hole cover gasket.
- Attending flange / Bonnet leakages either by tightening or by replacing the gasket / seal ring.
- Attending the problem of valve mechanical jamming.
- Welding of handles / putting new handles to the valve.
- Attending line & valve leakages by welding or replacing glands.
- All types of replacement of valve against passing & body leakages.
- Repair and revival of damaged valves/ parts of valves such as discs, spindles, bonnets etc.
- Check periodically for functioning of spray water system and repair/replace nozzle if required.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF CRANES AND HOISTS
MAINTENANCE ON EOT CRANES
- Carry out external cleaning of equipment.
- Greasing of bearings.
- Check the oil level of thruster brake, if low top-up with transformer oil.
- Lubrication of rope with cadmium compound.
- Check the brake adjustment / liner condition.
- Check the oil level in gearbox if level is low top-up.
- Take trial run for smooth operation.
- Motor decoupling and coupling to be carried out as per requirement
- Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
- Equipment external and internal cleaning to be done during every PM.
- Equipment painting to be done during every overhauling.
Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

Assisting and carrying out load test of the above as per the requirement of Load testing

**MAINTENANCE OF HOIST**

- Carry out external cleaning of equipment.
- Greasing of bearings.
- Check the oil level of thruster brake, if low top-up with transformer oil.
- Lubrication of rope with cadmium compound.
- Check the brake adjustment / liner condition.
- Check the oil level in gearbox if level is low top-up.
- Take trial run for smooth operation.
- Motor decoupling and coupling to be carried out as per requirement
- Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
- Equipment external and internal cleaning to be done during every PM.
- Equipment painting to be done during every overhauling.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.
- Assisting and carrying out load test of the above as per the requirement of Load testing

**MAINTENANCE ACTIVITIES OF S&M PUMP HOUSE AND ASSOCAITED SYSTEMS**

- PM and overhauling of all mechanical equipments and associated systems
- PM and overhauling to be carried out as per given SMP and checklists

**MAINTENANCE OF S&M PUMPS AND ASSOCIATED PIPING SYSTEMS WITH VALVES**

- Preventive maintenance and overhauling of S&M Pumps and associated piping systems.
- Internal and external cleaning of equipments and associated systems.
- Checking of foundation bolt and tightening.
- Checking and arresting any leakages from pump body/gland/valve body/pipeline flange etc by tightening or replacing packing or gaskets.
- Checking of rubber spider and alignment as per PM schedule.
- PM to be carried out as per given SMP and checklist
- Maintenance of associated valves and pipelines of the system
- Overhauling of pump and replacement of damage parts as per instruction of EIC
- Overhauling to be carried out as per given SMP and checklist
- Motor decoupling and coupling to be carried out as per requirement
- Arresting leakages from pipelines and valves including underground piping
- Necessary arrangements for excavation of underground piping should be done
- Replacement of pipeline and valves as per requirement
- Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
- Equipment external and internal cleaning to be done during every PM.
- Equipment painting to be done during every overhauling.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

**MAINTENANCE OF HEAT EXCHANGERS AND COOLERS**

- Carry out external cleaning of equipment.
- Arrest any steam/oil/water leakages if any.
- Removal and re-cladding of insulation after work completion.

**TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS**
> Checking for any tube leakages in heater/cooler.
> Plugging of tubes if required.
> Carry out hydro test of the heat exchangers and carry out repairs if any.
> Arresting leakages of associated pipelines/valves etc either by welding or replacing.
> Checking foundation of cooling water pump.
> Check coupling and alignment of cooling water pump monthly basis.
> Replace/service pump if required.
> Cleaning of suction/discharge strainer as and when required.
> Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF COAL SAMPLING UNIT AND AUGER SAMPLING UNIT
> Carry out external and internal cleaning of equipment includes jaw crusher, pulverizer (old & new both).
> PM to be carried out as per given SMP and checklist
> Overhauling of coal sampling unit and replacement of damage parts as per instruction of EIC
> Overhauling to be carried out as per given SMP and checklist
> Motor decoupling and coupling to be carried out as per requirement
> Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
> Equipment external and internal cleaning to be done during every PM.
> Equipment painting to be done during every overhauling.
> Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF EFFLUENT TREATMENT PLANT
> PM and overhauling of all pumps, blowers, piping’s and valves of effluent treatment plant.
> PM and overhauling to be carried out as per given SMP and check list.
> Motor decoupling and coupling to be carried out as per requirement
> Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
> Equipment external and internal cleaning to be done during every PM.
> Equipment painting to be done during every overhauling.
> Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF SEWAGE TREATMENT PLANT
> PM and overhauling of all pumps, blowers, piping’s and valves of sewage treatment plant.
> PM and overhauling to be carried out as per given SMP and check list.
> Motor decoupling and coupling to be carried out as per requirement
> Assistance to be given to C&I and electrical department as per requirement and instruction of EIC
> Equipment external and internal cleaning to be done during every PM.
> Equipment painting to be done during every overhauling.
> Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF ZERO DISCHARGE SYSTEM OF DM PLANT
> PM and overhauling of all pumps, blowers, piping’s and valves of zero discharge system.
> PM and overhauling to be carried out as per given SMP and check list.
> Motor decoupling and coupling to be carried out as per requirement
> Assistance to be given to C&I and electrical department as per requirement and instruction of EIC

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
 Equipment external and internal cleaning to be done during every PM.
 Equipment painting to be done during every overhauling.
 Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned as per the instructions of EIC.

MAINTENANCE OF PORTABLE WATER PIPINGS AND FIRE WATER PIPINGS

 Maintenance of portable water piping and fire water piping system is in contractor’s scope
 In case of underground leakages, service provider should arrange all necessary accessories such as excavator and manual excavating etc.
 Portable and fire water line of whole CPP-II is in contractor’s scope.
 Valves installed in these piping systems should be maintained by service provider.
 Piping supports should be checked and maintained by service provider.

SCOPE OF WORK FOR BOILER, MILLS & AUXILIARIES OF 4X135 MW POWER PLANT

Preventive & Routine Maintenance of Equipments of Boiler and Auxiliaries

1. Scope of Work for Boiler

 Visual Inspection & correction of hanger support.
 Scaffolding & small platform, temporary platforms in contractor scope for any repair & rectification work.
 Oil gun assembly Repair / replacement.
 SADC damper checking & repairing.
 Drum level gauge glass & hydra step Problem rectification will be in the scope of contractor, Material will be in balco scope.
 Boiler Drum manhole door gasket replacement.
 Expansion joints repairing & replacement will be in the scope of contractor, Material will be in balco scope.
 Coal nozzle & coal nozzle tip repairing will be in the scope of contractor, Material will be in balco scope.
 Refractory application work will be in the contractor scope & refractory will be provided by balco.
 Preventive maintenance & Problem rectification / replacement of Wall soot blower, APH Soot blower, Semi & long retractable soot blower.
 Soot blower Pressure Adjustment.
 Rope / gasket replacement of doors/gates/dampers.
 Removal & Re fixing of Insulation material & sheeting work will be in contractor scope, Material will be provided by balco.
 Online Sealing of Steam & Water Leakage in tubes, pipe & valves, flanges will be arranged by the contractors as per SMP.
 Small modifications jobs up to 10MT are in the scope of contractors and the material for the same will be supplied by BALCO.
 Painting of boiler’s hand railing, Fans, ducts, pipe lines for 5S activities, paint will be given by BALCO.
 Inspection of Hydraulic test for Boiler Pressure Parts will be in the scope of Contractor.
 Tube/Pipe bending (of any size) as per the requirement will be in the scope of contractor.
 Preventive maintenance of flushing pan & Eco Hopper leakages will be in contractor scope.
 Outside & inside Cleaning of the boiler & its auxiliaries will be in the contractor scope.
 Shifting of the scrap to specified area as per the guide lines of EIC will be in contractor scope.

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
➢ All type of Electrodes other than hard facing electrodes (must be ESAB/D&H CECHERON/ADORE make) is in contractor scope.
➢ Pressure setting of safety valve will be in contractor scope.
➢ Mother Oven & portable oven must be used during using the low hydrogen electrodes. Storage of the low hydrogen electrodes must be followed properly i.e. the same shall be stored by making the arrangement of heating, by using the halogen lights to maintain at least 50 deg Celsius in the storage place.

2. SCOPE OF WORK FOR COAL MILLS

➢ Cleaning/Replacement of the lube/Hydraulic oil filters.
➢ Replacement/top up of lube/Hydraulic Oil/Roller Oil as per requirement.
➢ Cleaning of Hydraulic Oil tanks.
➢ Maintenance of the hydraulic and lube oil station. Hydraulic or Lube oil pump repair/replacement to be done.
➢ Operation of the centrifuges and oil filtration machines supplied by BALCO.
➢ Maintenance of the centrifuges and oil filtration machines supplied by BALCO.
➢ Open the mill manhole door for inspection & adjustment of Shims of loading frame for gap setting between roller & Liner (Proper datasheet must be maintained & duly signed by BALCO’s EIC on monthly basis, as well the soft copy of the same datasheet must be sent by mail to BALCO’s EIC)
➢ Inspection of the tightness of the stuffing box bolts, classifier flange bolts & flange of coal discharge pipes
➢ Replacement of Stuffing box rope.
➢ Coal leakage points shall be less than 2 (for all four units).
➢ Inspection of the hydraulic pipeline & support properly. If needed rectification/Clamping to be done.
➢ Routine Maintenance of all the MDVs.
➢ Repair/Replacement of tie rod and gland housing.
➢ Routine maintenance of the mill gearbox. Periodic visual inspection the gearbox and adjustment.
➢ Replacement of bottom carbon seal/rope is in the scope of contractor.
➢ Inspection of the loading cylinders for any leakage. If needed rectification to be done.
➢ Repair of the Mill reject gate (Pneumatic/Hydraulic as well as manual doors).
➢ Cleaning of the coal from Primary air duct. Inspection of the duct for any leakage points if needed welding to be done on leakage points.
➢ Inspection/Repair/Replacement of the scrapers Assembly.
➢ Routine Maintenance of the cold air gate & dampers & its actuators removal and installation. Grease the bearings and If needed rectification/ replacement to be done.
➢ Routine Maintenance of the Hot air gate & dampers & its actuators removal and installation. Grease the bearings and If needed rectification/ replacement to be done.
➢ Cleaning the coal from inside of the mill & Check the clearance between the roller and Liner and it should be maintained as per instruction of EIC.
➢ Tracking of wear rate of grinding elements & maintaining proper datasheet of the same, duly signed by BALCO’s EIC on monthly basis. Mill health index to be maintained in which below mentioned objects must be covered & from the same vendor must plan the mill overhauling & send the requirement of spares list to BALCO EIC at least 3 months before for material procurement

A. WEAR RATE OF GRINDING ELEMENT
B. THROAT GAP BETWEEN GUIDE RING & TABLE NOZZLE
C. TABLE COLLAR THICKNESS
D. INTERNAL INSPECTION ALONG WITH PHOTOGRAPHS OF ROLLER ASSEMBLY, TABLE, C-CLAMP, DATASHEET OF MILL VIBRATION & ALL THREE ROLLER BEARING TEMPERATURE FOR THE MONTH
E. INSPECTION OF GEARBOX FOR ANY ABNORMAL SOUND ETC.
F. LAST BUT NOT THE LEAST THE EXISTING PM CHECKLIST MUST BE FILLED PROPERLY & THE SAME POINTS SHALL BE IN SINGLE EXCEL SHEET MONTHLY BASIS TO UNDERSTAND THE HEALTH CONDITION OF THE MILL ALONG WITH PHOTOGRAPHS.

- Checking of the tightness of all the bolts inside the mill (like loading frame, roller studs etc).
- Inspection/Repair Setting the classifier vane angle as per instruction of EIC.
- Check the movements of the rollers, i.e. check the roller bearings.
- Inspection/Replacement of Roller seal air assembly
- Checking of all type of valves (oil/inert steam/water/Seal air) associated to mill and if needed rectification/replacement to be done.
- Online leakage arresting & patch welding of mill discharge & center pipe is in contractor’s scope.
- Repair/replacement of rupture/safety diaphragm of Hot PA duct.
- Repair/Replacement of centre pipe & mill inlet gate is in the scope of contractor.
- Any kind of hard facing job is in the scope of contractor and the hardfacing electrodes will be supplied by BALCO
- Any kind of temporary arrangement for Mill isolation is in contractor’s scope.
- Any small modification is the scope of contractor for clearing coal choking from the mill.
- Painting of Mill/pipeline/duct/wall for 5S activities, paint will be given by BALCO.
- Repair/Replacement maintenance of hoist.
- Preventive maintenance of the hoist.
- Refurbishment/ reclamation of mill spare which requires minor repair.
- Material handling inside the plant and sometimes material handling outside the plant i.e. material sent for repairing to Korba.
- Replacement of Loading Cylinder or its base plate.
- Replacement of MDV
- Replacement of bearings of roller assembly
- Replacement of Mill Roller & liner segments
- Repair of Hot Air Damper / Cold air Damper
- Inspection of Grinding Track
- Inspection of Grinding Table
- Inspection of Guide Ring
- Contractor has to maintain the spare equipments/assemblies.
- All type of Electrodes (must be ESAB/D&H CECHERON/ADORE make) other than hard facing electrodes is in contractor scope.
  - Mother Oven & portable oven must be used during using the low hydrogen electrodes. Storage of the low hydrogen electrodes must followed properly i.e. the same shall be stored by making the arrangement of heating by using halogen lights to maintain at least 50 deg Celsius in the storage place.
- Mill availability must be must be 100% throughout the year. Otherwise Penalty shall be implied.
  - After 3 months of mobilizing the site, all the leakages from the mill area shall be optimized i.e. the coal leakage point shall be Zero.

3. SCOPE OF WORK FOR COAL FEEDERS
- Daily cleaning of feeder body externally.
- Checking of belt Alignment.
- Inspection& Clearing of any foreign materials stuck up between body and belts.
- Running the feeder and carry out alignment if necessary.
- Checking / maintaining oil level of gearbox (Belt Drive & Scraper Chain).

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
Greasing of bearing.
Checking / adjustment of chain tension.
Greasing of inlet & outlet gate.
Patch welding feeder & feeder inlet pipe
Spill over oil / water / cotton waste / debris etc in surrounding area and floor to be cleaned.
Repair/replacement/Maintenance of air cannon.
Opening of feeder doors for calibration.
Opening of gearbox for inspection & servicing including replacement of bearing & oil seals.
Replacement of new chain link.
Replacement of bearings and seals of DE & NDE pulley.
Servicing/ Replacement of Chain Scraper
Feeder Belt replacement
Cleaning of Choked raw coal feeder and checking of feeder internals:
Opening of feeder doors after isolation.
Removal of accumulated coal dust / coal manually outside.
Emptying of feeder area.

a. Complete checking of feeder internals for any apparent damage and submission of report to Engineer-in-charge.
b. Transportation of coal from feeder area to area as directed by Engineer-in-charge.
c. Box up and trail run of feeder.

Feeder door opening and closing for Belt calibration.
Clearing of choking of coal bunkers
Bunker inspection if as & when required.
DE & NDE pulley replacement.
Roller bearing replacement.
Roller replacement.
Replacement of belt/scrapper gearbox of feeder.
Bunker inspection from inside & outside
Painting of feeder & bunker body once in a year, paint will be providing by balco.

4. SCOPE OF WORK FOR ID/FD/PA/SEAL AIR/SCANNER AIR FANS

Cleaning of equipments by vacuum cleaner will be contractor scope.
Replacement of lubricants/top up of oil and cleaning of filters.
Repair/Replacement of cooling water line and oil line.
Routine Maintenance of Dampers/IGV’s & Gates.
Removal & Installation of actuators.
PM of fans including alignment check and minor repair of insulation.
Preventive Maintenance/repair of Hoist.
Preventive Maintenance of bearing cooling air fans.
Oil leakage arresting if any.
Bearing replacement of fans.
Inspection of bearing.
Arrangement for Balancing (Opening Manhole door, inspection of blades, welding of the blades for rectification, welding of balancing weights & box up after rectification) will be in the contractor’s scope.
Repair of Hoists.
Repair/Replacement of expansion bellow.
Impeller replacement of Fans.
Replacement of coupling.
5. **Scope of Work for APH**

- Check the oil level in support & guide bearing sump. If found low, top up and maintaining logbook of oil top up.
- Daily cleaning of gearbox and surrounding area by air and cotton waste.
- Daily check for any abnormalities of main reducing gearbox during running condition.
- Check the oil level in main drive gearbox. If found low, top up and maintaining logbook of oil top up.
- Check the air filter oil drain plug, if loose tight it up. If oil level is low, top up.
- Repair/replacement of AC & DC motor, coupling.
- Inspect sector plate bolts for looseness & breakage from outside.
- Main reducer gear box bearing greasing as and when required.
- Carry out external cleaning of soot blower gearbox.
- Check the oil level in soot blower gearbox. If low, top up, checking of coupling spider, checking of foundation bolt tightness and take corrective action if required. Check for oil leakage. If found, arrest it.
- APH Soot blower Problem rectification / replacement.
- Repair/Replacement of expansion bellow.
- Repair/Replacement of Clutch Coupling/bush coupling/fluid coupling.
- Gear box inspection/replacement.
- Arrangement of winch m/c for shifting of gear box will be contractor scope.
- Seals adjustments in opportunities.
- All seals replacement.
- Damper repairing & replacement of damage damper flaps.
- Motor Alignment.
- Leakage arresting of APH hoppers.
- Preventive Maintenance/repair of Hoist.
- Repair/replacement of flushing pan & Eco hopper line.
- High pressure cleaning of basket.
- Partial Seal Setting.
- Cooling water line maintenance.
- Painting of APH body & its gear box including cooling water pipe line, platform handling once in a year fan will be in contractor scope & paint will be provided by balco.

6. **Scope of Work for Ducts**

- Duct cleaning.
- Duct repairing, duct plate replacement.
- Duct supports Repairing/replacement.
- Expansion bellow repairing/replacement.
- Repair of duct manhole doors and provision of sealing rope.
- Painting of PA & SA duct once in a year.

7. **Scope Work for Soot Blowers**

- Clean the equipment thoroughly.

**Tender Document for Operation & Maintenance of Power Plants**
➤ Check the gasket condition at the flange position & replace if required.
➤ Check the gland packing condition & replace if required.
➤ Check for smooth rotation of the guide bar support roller bearing & lubrication.
➤ Check the oil level in gear box & top up if required.
➤ Check and lubricate the poppet valve.
➤ Check and lubricate the main bearing.
➤ Clean and lubricate the rack gear.
➤ Servicing of lance tube.
➤ Dismantle lance tube and flange coupling.
➤ Clean and check its straightness and rectify minor bends, otherwise takeout bent lance tube after providing scaffolding inside furnace if required.
➤ Fit new or repaired lance tube.
➤ Fix flange coupling.
➤ Servicing of Poppet valve
➤ Remove Poppet valve by dismantling inlet and outlet
➤ Take out spindle and disc.
➤ Check spindle and disc, if ok then assemble it after proper lapping.
➤ Replace spindles and disc if required.
➤ Assemble Poppet valve completely.
➤ Fit Poppet valve to its position with new gasket.
➤ Check for any leakage & attend.
➤ Servicing Gear Train Arrangement:
➤ Drain out oil of the gear box.
➤ Remove gear box and dismantle.
➤ Clean all components thoroughly.
➤ Replace damaged components and gears if required.
➤ Assemble all components and fit gear box at its position.
➤ Clean rack & pinion assembly and lubricate properly.
➤ Dismantle guide ring box.
➤ Takeout guide ring, check it, repair/replace if required.
➤ Assemble guide ring box and fit it to its position.
➤ Fill oil in gear box.
➤ Repair/replacement of soot blower guide stand :
➤ Takeout old guide stands, repair/replace if required.
➤ Fit guide stand to its correct position with sufficient support.
➤ Pressure setting and checking of soot blower :
➤ After completion of the work, pressure setting and checking to be done.
➤ Remove plug and air connection.
➤ Fit pressure gauge with adopter.
➤ Check pressure setting and adjust it to the correct one if required.
➤ Remove pressure gauge with adopter.
➤ Fit plug and air connection.
➤ Pressure settings & Trial
➤ Painting of soot blower body every year, paint will be provided by balco.

8. **SCOPE OF WORK FOR VALVES/NRV**

➤ Attending gland leakages either by tightening or by replacing the glands.
➤ Hot tightening of gland nuts.

**TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS**
Greasing of valves of all sizes as per requirement.

Safety valve pressure setting as per requirement.

Attending flange / Bonnet leakages either by tightening or by replacing the gasket / seal ring.

Hot tightening of flange or bonnets.

Removal / re-fixing of cladding / insulation required for completion above job.

Repair of Valves as per requirement.

Replacement of valves as per instruction of EIC.

Attending the problem valve mechanical jamming.

Welding of handles / putting new handles to the valve.

Repair and revival of damaged valves/ parts of valves such as discs, spindles, bonnets etc.

Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

Attending leakage and replacement of Gauge Glass.

Cleaning and replacement of strainers.

Inspection/ repair of control valves.

Inspection/repair/testing of Safety valves.

9. SCOPE OF WORK FOR ESP & FF

Check the rapper rod connection ( anvils) for loose, broken and bent connections.

Inspection / Replacement of Rapping mechanism bearings and gearbox.

Inspection / Replacement of Rapping mechanism shaft.

Inspection / Replacement of fastener during assembly.

Inspection / Replacement of tumbling hammer assembly.

Inspection / Replacement of Rapping mechanism Gearbox.

Reconditioning of gear box at site.

Check the alignment of collecting electrodes, shock bars, guides and support.

Inspection / Replacement of shock bars / shock pad.

Rectification of collecting electrodes.

Inspection of emitting electrodes.

Inspection / Cleaning of support insulator and housing for excessive build-up of ash.

Inspection / Cleaning of shaft insulator.

Replacement of cracked shaft & support insulator.

Inspection / Servicing / Replacement of pin wheel & its mechanism.

Preparation of scaffolding for any repair work.

Remove the insulation from the leaky area.

Arresting the leakage by welding the leakage area.

Re-fix the insulation after arresting the leakage.

Removing scaffolding and scraps after completion of job.

Inspection of ESP fields during short shutdown

Correction & Replacement of GD Screen.

Replacement of insulators.

Routine Maintenance of Seal Air Fan of Bag Filter Dampers.

Replacement of bearing of Seal air fan if required.

Replacement of Cage & Bag.

Repair & replacement of ESP hoist.

Damper checking & it’s any problem rectification.

Waster & dry washing of hoppers. (if required)
10. **MAINTENANCE OF DIESEL GENERATOR SET**

- Carry out external cleaning of equipment.
- Check the Lub oil level if low top-up with approve brand of oil.
- Check the tightness of foundation bolt & take corrective action if required.
- Check the coupling in between engine and generator if found damaged then replace and realignment to be done.
- Check the radiator water level if low top up with water.
- Check the tightness of radiator fan belt.
- Clean the inlet air filter elements if damaged replace the same.
- Check for any leakage in oil, diesel & water system if found then attend the same.
- Clean / check the lube oil filter element.
- Check the alignment of engine and generator and take corrective action.
- Change the lube oil & lube oil filter element. Thoroughly soak the density type strainer element in clean fuel oil before installing.
- Change the diesel filter element.
- Assisting for inspection / repair / servicing during expert visit as per instructions.
- Top up of diesel as and when required.
- Take trial run for smooth operation.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.
- Repair/ replacement of turbo charger, Spares will be given by balco.
- Preventive maintenance to be done as per the schedules or as per instruction of EIC.
- B-Check
- Painting of cooling tower, pipe line, DG chimney pipe & its structure once in a year paint will be given by balco.

11. **MAINTENANCE ON HOIST**

- Carry out external cleaning of equipment.
- Greasing of bearings.
- Check the oil level of thruster brake, if low top-up with transformer oil.
- Lubrication of rope with cadmium compound.
- Check the brake adjustment / liner condition.
  - Check the oil level in gearbox if level is low top-up.
  - Take trial run for smooth operation.
  - Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned.
  - Assisting and carrying out load test of the above as per the requirement of Load testing.
  - Maintain separate records to Hoists maintenance.
  - Update Testing dates and next testing dates on the Hoists and Pressure vessel.
  - Painting of Hoist & plate form body every year paint will be provided by balco.

12. **Maintenance of Ammonia System:**

- Ammonia leakage to be checked.
- Hose replacement.

**TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS**
Pipe line leakage checking & rectification.
Shower system maintenance.
Nozzle replacement.

13. **Maintenance of Boiler elevators & chimney elevator:**

- Carry out external cleaning of equipment.
- Greasing of bearings.
- Check the oil level of thruster brake, if low than top-up.
- Lubrication of rope with cadmium compound.
- Check the brake adjustment / liner condition.
- Check the oil level in gearbox if level is low top-up.
- Take trial run for smooth operation.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.
- Assisting and carrying out load test of the above as per the requirement of Load testing.
- Maintain separate records to Hoists maintenance.
- Update Testing dates and next testing dates on the Hoists.
- Cleaning & greasing of track & side wheel.
- Maintenance of its EHU unit (except electrical system).

14. **Maintenance of Boiler Hydro & filling Station:**

**Hydro Pump:**

- Clean the total system by air.
- Check the Foundation Frame/Fasteners.
- Open the suction filter and clean the cartridge by air & clean the rust also by rust remove spray.
- Checking of oil level, top-up & any leakage rectification.
- Checking of gear box & its spare condition.
- Checking of coupling.
- Its overhauling if needed.
- Pressuring valve overhauling.
- Painting of Pump body every year paint will be provided by Contractor.

**Filling Pump:**

- Check the oil level if it is top up by (tubinol-46).
- Check any leakage from fitting or flange.
- Check the coupling tightness.
- Check any leakage from mechanical seal.

15. **Maintenance of Bottom ash hydraulic gate & seal trough:**

- Oil level checking & its top up.
- Cylinder replacement.
- Gate repairing / replacement.
- Oil seals replacement.
- Seal trough filling pipe line repairing/replacement.
Valve repairing/replacement.
Seal trough expansion plate replacement.
Oil station annual overhauling.
Hose replacement.

16. **Maintenance of ECU:-**
   - Filter cleaning
   - Bearing checking & replacement (if required).
   - Cooling line maintenance.
   - Blower maintenance (repairing & maintenance).
   - Shower maintenance.
   - Monthly preventive Maintenance.
   - Annual overhauling.
   - CBM on monthly basis.

17. **HFO & LDO Oil Gun:-**
   - Cleaning of oil gun, body and nozzle.
   - Replacement of hose.
   - Replacement of oil gun assembly as per the requirement.
   - Maintenance of isolation valves.
   - Replacement & repair of isolation valves & its associated pipe lines.
   - Rebuilding of oil guns.

18. **Burners:-**
   2. Coal nozzle tip repair.
   3. SADC repair & replacement & freeness checking as per the requirement.
   4. Burner tilt checking & its adjustment.
   5. SADC cylinder decoupling & unloading.

19. **Pressure parts:**
   - Tube leakage to be identified at boiler.
   - Mobilization of Material & required man power at site within 8hrs from the intimation.
   - Tube replacement as per the specification & SMP.
   - Pre heat treatment & post heat treatment to be done as per smp.
   - Radio graphy, Stress reliving, thickness survey, DP test to b done to be
   - CAVT screen to removal & fixing to be done.
   - Refractory as per the requirement to be fixed.
   - Shielding to be fixed on tube.
   - If required bend are not available at site than maintenance contractor has to be made at site
     with the help of bending machine or hot bending.
   - Manhole door replacement to be done.
   - Refractory work on manhole doors, CAVT angles to be done.
   - Material build up to be done as per the requirement at site.
   - Insulation & its cladding work removal & fixing to be done.
   - If any requirement of ash cleaning than it has to be done by the maintenance contractor.
   - After the completion of the job generated scraps to be remove at with in 24 hrs.

**TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS**
- 24 V supply to be used in Boiler & ESP.
- Special manpower require for the 1st pass scaffolding to be arrange as per the site requirement.
- Spares keeping at site & its record to be maintained by the maintenance contractor.
- All the consumable (i.e. electrodes, filler wire, gas etc.) will be contractor scope only spares will be issued by balco.

20. IBD TANK
- Gasket replacement.
- Internal inspection & Correction to be done if required.
- Outlets vent hanger inspection.
- Thickness measurement & its record to be maintained.
- Vent pipe line replacement if required.

20 Specialized OEM/ Expert Services

<table>
<thead>
<tr>
<th>S.No</th>
<th>OEM/Expert Services</th>
<th>Routine</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vibration Monitoring (CBM) on Daily Basis</td>
<td>Daily</td>
</tr>
<tr>
<td>2</td>
<td>Atlas Copco Compressor</td>
<td>Need basis</td>
</tr>
<tr>
<td>3</td>
<td>Cummins DG Set</td>
<td>Quaterly and Need basis</td>
</tr>
<tr>
<td>4</td>
<td>IR compressor</td>
<td>Quaterly and Need basis</td>
</tr>
<tr>
<td>5</td>
<td>Boiler Feed Pump &amp; Hydraulic Coupling</td>
<td>On Need basis</td>
</tr>
<tr>
<td>6</td>
<td>Fusheng Compressor</td>
<td>On Need basis</td>
</tr>
</tbody>
</table>

COMMON SCOPE FOR MECHANICAL
ARRANGEMENT OF SCAFFOLDING AND MAINTENANCE PLATEFORMS
- Necessary scaffolding at work site with material should be arranged by contractor as per instruction of EIC.
- Maintenance platforms should be prepared by contractor as per instruction of EIC.
- Scaffolding and maintenance platforms should be certified by EIC and safety in charge of BALCO and suggested changes needs to be done by contractor.
- All safety norms should be followed strictly.

INSULATION AND CLADDING WORK
- Removal and fixing of insulation and cladding for all maintenance related activities is in service provider’s scope.
- Insulation material shall be provided by BALCO.
- Correction of insulation work as per thermal image survey report is in service provider’s scope.
- Quality of insulation work shall be monitored strictly and instructed correction should be done on immediate basis.

List of Mechanical Tools, Tackles & Consumables:
The agency shall supply tools and tackles necessary for the Service as per attached list. All tools and tackles including mobilization tools brought to the Project by agency shall be agency’s property and shall be taken away by the agency at the time of termination of the contract.

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
LIST OF CONSUMABLES

01. Kerosene, diesel, petrol and rust remover
02. CTC, Benzene etc.
03. Hacksaw blades.
04. Cotton waste.
05. Marking cloth and old cloth.
06. Asbestos cloth.
07. Prussian blue.
08. Lead wire (1.0 mm, 1.5 mm, 0.5 mm)
09. Liquid soap/soap powder.
10. Carborundum grinding paste (fine, medium and coarse)
11. Cut off wheels.
13. Sealing agents like M seal etc
14. Adhesive agents like locktite etc
15. Cleaning agents like WD-40, Terpentine oil etc
16. Oil stones.
17. Mounted wheels and rotary cutters.
18. Oxygen and D/A cylinders.
19. DP test kit and coir rope.
20. Chalks, marking pens, and thermal chalks up to 600°C
21. Insulation and medical tapes.
22. Polythene sheets.
23. Material for blast cleaning purposes.
24. Hand gloves (asbestos and rubber), manila rope.
26. Air blower (electric)
27. Electric drills of various sizes
28. Ball pen hammer of various sizes.
29. Electric switchboards and floor light arrangements.
30. Magnifying glasses.
31. Safety Helmets for labors.
32. Gas cutting and welding goggles.
33. Argon gas welding equipment.
34. Hand gloves Cotton & Leather.
35. Shims of various thickness
36. Sealant putty
37. Gland Ropes of different sizes
38. Oil/water/paper/rubber & metallic gaskets( Special high temp. spiral wound gasket is in the scope of BALCO)
39. Industrial paint (Yellow, Green, Black, Smoke grey, Red etc) , paint brush & thinner
40. LT bolts , Nuts and washers of sizes up to 36 mm
41. HT bolts , Nuts and washers of sizes up to 24 mm
42. Oil seals of all sizes
43. O-ring cords of all sizes
This list is only indicative and not exhaustive. Arrangement for any other consumables required for timely completion of the job shall be the responsibility of the Contractor.

**LIST OF T&P**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Welding Generator with Regulator</td>
<td>Standard make</td>
</tr>
<tr>
<td>2</td>
<td>Welding Transformer</td>
<td>Standard make</td>
</tr>
<tr>
<td>3</td>
<td>Chain Pulley Blocks 10T</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Chain Pulley Blocks 5T</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Chain Pulley Blocks 3T</td>
<td></td>
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<tr>
<td>6</td>
<td>Chain Pulley Blocks 2T</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Chain Pulley Blocks 1T</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Pulling Lifting M/c 3T</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Pulling Lifting M/c 1.5T</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>D/E Open Spanners Up to 75</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>D/E Ring Spanners Up to 75</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>S/E Long handle Open Spanners 50, 55, 60, 65, 70, 75</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Star Hammering Spanners 24, 30, 32, 36, 41, 46, 50, 55, 60, 65, 70, 75</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Box Spanner</td>
<td>Up to 75</td>
</tr>
<tr>
<td>15</td>
<td>T - Handle for above</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Tubular Spanner 6 x 7 to 30 x 32</td>
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<tr>
<td>17</td>
<td>Adjustable Spanner</td>
<td>12&quot;, 6&quot;</td>
</tr>
<tr>
<td>18</td>
<td>Pipe Wrench 24&quot;, 18&quot;, 12&quot;, 6&quot;</td>
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</tr>
<tr>
<td>19</td>
<td>Screw Driver 18&quot;, 12&quot;</td>
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<tr>
<td>20</td>
<td>Torque Wrench</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Combination Pliers</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Outside Circlip Pliers</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Inside Circlip Pliers</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Nose Pliers</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Hydraulic jack with pump 100T</td>
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</tr>
<tr>
<td>26</td>
<td>Hydraulic jack with pump 50T</td>
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</tr>
<tr>
<td>27</td>
<td>Button Hydraulic Jack Pump 20T, 50T</td>
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</tr>
<tr>
<td>28</td>
<td>Crow Bar 1&quot;</td>
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<tr>
<td>29</td>
<td>Temperature Gun</td>
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</tr>
<tr>
<td>30</td>
<td>Bending Machine</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Motorized Chain Block</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Sledge Hammer 20lbs, 10lbs, 4lbs</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>BP Hammer 1.5lbs</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Outside Micrometer</td>
<td>0 – 25</td>
</tr>
</tbody>
</table>

**TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS**
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>Outside Micrometer</td>
<td>0 – 150</td>
</tr>
<tr>
<td>36</td>
<td>Inside Micrometer</td>
<td>150 – 300</td>
</tr>
<tr>
<td>37</td>
<td>Inside Micrometer</td>
<td>300 – 400</td>
</tr>
<tr>
<td>38</td>
<td>Inside Micrometer</td>
<td>50 – 500</td>
</tr>
<tr>
<td>39</td>
<td>Inside Micrometer</td>
<td>50 – 1000</td>
</tr>
<tr>
<td>40</td>
<td>Vernier Caliper</td>
<td>12”</td>
</tr>
<tr>
<td>41</td>
<td>Vernier Caliper</td>
<td>6”</td>
</tr>
<tr>
<td>42</td>
<td>Dial Gauge with Magnetic Stand</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Allan Key</td>
<td>14, 16, 20, 24</td>
</tr>
<tr>
<td>44</td>
<td>Gas Cutting Set</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Argon Set</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Welding Cable</td>
<td>400 amps</td>
</tr>
<tr>
<td>47</td>
<td>Master Level</td>
<td>4”</td>
</tr>
<tr>
<td>48</td>
<td>Spirit Level</td>
<td>8”</td>
</tr>
<tr>
<td>49</td>
<td>Plum bob</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>Shim Cutter</td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>Angle Grinder</td>
<td>AG – 7</td>
</tr>
<tr>
<td>52</td>
<td>Angle Grinder</td>
<td>AG – 5</td>
</tr>
<tr>
<td>53</td>
<td>Angle Grinder</td>
<td>AG – 4</td>
</tr>
<tr>
<td>54</td>
<td>Straight Grinder</td>
<td>GQ – 4</td>
</tr>
<tr>
<td>55</td>
<td>Flexible Shaft Grinder</td>
<td>FF – 2</td>
</tr>
<tr>
<td>56</td>
<td>High Speed Grinder</td>
<td>HSG</td>
</tr>
<tr>
<td>57</td>
<td>Portable Drilling M/c</td>
<td>up to 12 mm</td>
</tr>
<tr>
<td>58</td>
<td>Drill Bit</td>
<td>Assorted Size</td>
</tr>
<tr>
<td>59</td>
<td>Wire Rope Slings</td>
<td>Assorted Size</td>
</tr>
<tr>
<td>60</td>
<td>Eye Bolt</td>
<td>Assorted Size</td>
</tr>
<tr>
<td>61</td>
<td>Wooden Sleepers</td>
<td></td>
</tr>
<tr>
<td>62</td>
<td>Scaffolding Pipes</td>
<td>6 mtrs length</td>
</tr>
<tr>
<td>63</td>
<td>Scaffolding Pipes</td>
<td>3 mtrs length</td>
</tr>
<tr>
<td>64</td>
<td>Scaffolding Clamps (Fixed type)</td>
<td></td>
</tr>
<tr>
<td>65</td>
<td>Scaffolding Clamps (Swivel Type)</td>
<td></td>
</tr>
<tr>
<td>66</td>
<td>Scaffolding Planks (Metallic)</td>
<td></td>
</tr>
<tr>
<td>67</td>
<td>Bearing Puller</td>
<td></td>
</tr>
<tr>
<td>68</td>
<td>Measuring Tape</td>
<td></td>
</tr>
<tr>
<td>69</td>
<td>Torch</td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>Bearing Heaters</td>
<td></td>
</tr>
<tr>
<td>71</td>
<td>Chop saw Machine</td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>Magnetic drill machine</td>
<td></td>
</tr>
<tr>
<td>73</td>
<td>Hand drill machine</td>
<td></td>
</tr>
<tr>
<td>74</td>
<td>Thread die (mm)</td>
<td>4 to 24</td>
</tr>
<tr>
<td>75</td>
<td>Thread die (Inches)</td>
<td>4 to 24</td>
</tr>
<tr>
<td>76</td>
<td>Valve-seat lapping machine, portable lapping machine (Motorized or pneumatic)</td>
<td></td>
</tr>
<tr>
<td>77</td>
<td>Torque wrench (Motorized or hydraulic)</td>
<td></td>
</tr>
<tr>
<td>78</td>
<td>Bench vise</td>
<td></td>
</tr>
<tr>
<td>79</td>
<td>Angle finder</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>Needle dial gauge</td>
<td></td>
</tr>
<tr>
<td>81</td>
<td>Pedestal Fan with chicken mesh covering and extension cable with plug / socket</td>
<td></td>
</tr>
</tbody>
</table>

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
84 DC lamps
85 AC to DC convertor (Portable transformer kit)
86 Laser alignment kit
87 Bearing / Coupling Puller
88 Nitrogen filling kit for accumulators
89 Portable exhaust fan with accessories
90 Slide wrench
91 Tripod stand for working in confines space
92 Public announcement system / kit/Display / Notice Board
93 Vacuum cleaner
94 Dewatering pump with accessories
95 Safety net for work at height
96 Safety belts (Double hooking)
97 Rescue kit for work at height
98 Portable welding machine with accessories

This list is only indicative and not exhaustive. Arrangement for any other T & P required for timely completion of the job shall be the responsibility of the Contractor. All T&P should be newly procured 2015 onwards, along with test certificates.

**Transportation vehicle**

<table>
<thead>
<tr>
<th>S.No</th>
<th>Vehicle</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Forklift (Daily G shift and need basis)</td>
<td>2 nos.</td>
</tr>
<tr>
<td>2</td>
<td>Hydra (1 more hydra at the time of mill overhauling).</td>
<td>1 no.</td>
</tr>
<tr>
<td>3</td>
<td>Tractor (Daily G shift and need basis)</td>
<td>1 no.</td>
</tr>
<tr>
<td>4</td>
<td>Pick Up for spare shifting (One for CHP &amp; Electrical)</td>
<td>2 No.</td>
</tr>
<tr>
<td>5</td>
<td>Trailer (As per need)</td>
<td>1 no.</td>
</tr>
<tr>
<td>6</td>
<td>Cherry Picker (Daily G shift and need basis).</td>
<td>1 no.</td>
</tr>
<tr>
<td>7</td>
<td>Standard hydraulic trolly for shift cylinder, and spare up to 2T.</td>
<td>5 no.</td>
</tr>
<tr>
<td>8</td>
<td>Cage Trolley for Drum shifting.</td>
<td>5 no.</td>
</tr>
</tbody>
</table>

Availability of above mentioned vehicles should be round the clock, except need base vehicles.

**SCOPE OF WORK FOR INSTRUMENTATION MAINTENANCE – 4x135 MW**

**C&I Maintenance**

BALCO 540MW (4X135 MW) is ready for production. The units are associated with Honeywell DCS & Invensys DEH, Field instruments for Boiler-Turbine-Generator and their auxiliary systems.

**DCS SYSTEM:**

- The DCS shall cover the entire Control / Monitoring of the plant such as Boiler Integral controls including Boiler Protection, Turbine Integral Controls including Turbine Protection, Balance of Plant controls including Feed & Condensate water, Auxiliary steam, Cooling water etc., Boiler protection shall comply to NFPA requirements.
• DCS shall have suitable, proven serial OPC links to Utility plant PLCs (of Ash Handling, Water treatment) for operation and monitoring. The controls of these plants shall be implemented in respective redundant PLCs. Each utility PLC shall be supported by one PC based station for operating / engineering during startup. Normal operation will be from control room.

• Utility plants like LDO handling and Effluent collection and forwarding system shall be operated from respective Local control panels / Boxes. For ACV plant hardwired status monitoring shall be provided in DCS.

• Control room / equipment room panels and racks.
• All primary sensors like flow elements, temperature sensors, etc.
• All field instruments – process switches, transmitters, local gauges, etc.
• All final control elements like control valves, de-super heaters and actuators.
• All gas analyzers and emission monitoring instruments.
• All Machinery monitoring instruments, vibration monitoring and temperature measurements.
• All boiler integral instrumentation including secondary air damper control system, Burner Management System (BMS), Soot blower control system, etc.
• All turbine integral controls & instrumentation like turbine supervisory instruments, Automatic Turbine Run Up System (ATRS), Electro-hydraulic Governor Control (EHG), provision for manual testing of ESV & Over speed Governor, Turbine Protection System, etc.
• All junction boxes, cubicles, enclosures, local panels, pneumatic and process hook up hardwired cables and other erection materials and accessories.
• Master and slave clock system.
• Maintenance and calibration equipment.

• Complete control monitoring and protection system of all auxiliary systems and offsite facilities like Coal Handling Plant, Ash Handling Plant, Water Treatment plant, etc., with facility to interface with main DCS.
• Sequence of event recording and annunciation system as a part of DCS.
• 6.6 kV and 415 V auxiliary power system and equipment / plant status monitoring in DCS.
• Operation & control of circuit breakers requiring synchronizing from DCS in auto mode.

2.6 Areas to be covered under Contractor’s Instrumentation scope:
C&I Maintenance contract includes DCS, PLC, Field equipment, Control & Supervisory units for BTG. Area of scope will be Main plant & BOP, AHP & CHP
including DM Plant, CWPH, RWPH, FOPS, ESP, Bag filter, SWAS, Flue Gas System, Soot Blower System, Coal Feeder, vsds associated with C&I system, Control Valves, Motorized Valve, Integrated Valves and modules associated, Compressor, Emergency DG, Main plant means BTG along with associated auxiliaries, Cooling Tower, DM Plant, RWPH, FOPS, Fire Fighting System, PA system (DADX/EPABX), Smoke Detectors, Truck tripper, AHP, GEHO, CHP, Static and In motion weigh bridges.

Maintenance, Software handling of DCS, Minor Logic modification, Minor Logic Development as and when required & incorporates in DCS, PLC for the existing I/O’s.

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.

Which includes Preventive/maintenance, Repair, Overhauling, Modifications, New Installations (For replacement & Improvement jobs), Routine/Non Routine Calibrations, Trouble Shooting, Dismantling, Fabrication, Mounting, Lubrication, Covering, Cleaning, Checking & Addition / Deletion of Instrumentation process connections, Cable Replacement, testing, removing / Laying (Whenever required) with conduit / Traying of Instruments (When ever 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’s 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.

Any maintenance/repair jobs in DCS and PLCs’ will be in Contractor scope.

Contractor using the laboratory/laboratory equipment provided by the Company 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’s scope.

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.

All maintenance/repair/overhauling etc. for the pneumatic/motorized/hydraulic actuators.

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.

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.

Maintenance, minor repair works, cleaning of computers, printers, mouse etc. involved in plant automation.

Painting of damaged, dismantled, and rusted portions etc. in field instrumentation and panels.

Applying lubricant, cleaning filters, removing chokes in the impulse line, filters, plugging leaks etc.

Attending Trouble shooting and other emergency time/jobs.

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.

Checking of cables and terminations, Laying and connecting of cables as and when required
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.
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.
All consumables including brass fittings, non-metallic & metallic tubes shall be under Contractor’s scope.
The removing, replacement, shifting of field and panel instruments and motorized valves actuator, control valves actuator as per advice of Company engineers shall be in Contractor’s scope.
Maintenance of lab instruments, provided by Company & of its own.
Calibration of Master calibrating instrument by recognized and authorized external agency.
Passivation and preservation of removed instrument A/C storage place to keep Electronic Cards shall be provided by BALCO.
Co-ordination with OEM for specialized activities on Company’s instruction.
Tools as per Company’s instruction.
29. Tagging of instruments and cables for Faulty & damaged one.
30. Instrument network maintenance including fiber optic splicing.
31. Communication tools such as laptop, cables will be Company’s scope however relevant software will be BALCO scope
32. Forcing and protection bypass, logic and graphic changes are not allowed without owners’ written permission.
33. Access to engineering stations will be restricted to previous approval from Company.
34. Requirements related to boiler inspector and environmental auditors to be fulfilled by Company
35. Material movement from store to site and site to store and managing local store.
36. Site cleaning after maintenance activity.
37. Co-ordination for AMC activities with OEM/Expert agencies for DCS,PLC and other critical equipment where criticality of equipment is more and it needs expertise.
38. Consumable 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 the approval of owner.

39. 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.

40. Earth Pit maintenance will be in contractor scope including the consumables and painting will be in its scope.

41. Chemical laboratory instrument/analyser calibration/maintenance and upkeep will be in contractor’s scope.

42. CCTV Maintenance- Maintenance and Up keeping of CCTV camera system.

43. Break Down failure & Root Cause Analysis Report: For any type of breakdown contractor must be submit a failure analysis report within 24 hours with proper justification and implementation of CAPA for the same.

44. Safety & 5S : Contractor Participation must be 100% in 5S, Quality circles & plant safety related activities like HI/HE etc. throughout the year. All employees must be wearing proper PPE as per requirement.

2.7 General Technical works:

1. All daily, Routine and corrective maintenance
2. Preventive maintenance
3. Repair of Instruments
4. Shutdown and breakdown maintenance
5. Condition based monitoring
6. Minor modification / up gradation in the existing system including cable laying, cable dressing, cable termination circuit modification, logic modification/cards addition or removal in any DCS/PLC & related jobs has to be executed by contractor as per requirement of BALCO EIC. However, cable laying & dressing done in excess of predefined limit will be covered under category of Payable Scheduled Jobs. Quantum of work will be certified by BALCO EIC prior and after job completion and EIC decision will be final.
7. Periodicity of PM & routine jobs will be as per the standard practice as agreed by BALCO EIC.
8. Preparation of maintenance history for all types of maintenance in Hard As well as soft copy & monthly submission to BALCO EIC.
9. All modification jobs are to be entered into the master drawings and modified part drawings must be pasted on the respective panel. All modifications carried to be incorporated in the existing drawings. Any drawing development of spares/equipment is in Contractor’s scope.

10. Monthly up-date of spare & consumables requirement.

11. Provide reconciliation status of spares & consumables issued by BALCO on monthly basis.

12. Responsible for security, up-keep and periodic updating of Lab equipments, spares & consumable stock at local stores. Necessary support to lab master instruments calibration party arranged by BALCO.

13. All kind of spare materials, equipments inside the plant which includes, receiving materials from central stores or directly from vendor and store the same in local stores or site as per instruction from BALCO EIC, and material shifting from site to central stores and vice versa as required. O&M contractor has to maintain vehicle for the same.


15. Any machining job, arising in course of repair, is in Contractor scope.

16. Contractor shall position an expert manpower for Laboratory works, calibration, welding and fitting processes.

17. Contractor has to extend manpower and tools support during modification job initiated by owner. Owner will consider if any job suffers due to lack of manpower during such period.

18. Contractor has to ensure data history of DCS, PLC.

2.8 AMC Clause & Co-ordination with OEM:

| 540MW |
Having AMC with OEM for above area/instrument doesn’t relieve contractor from its day to day responsibility to maintain the same by their own. Decision of calling OEM for AMC will be of BALCO.

2.9 Other Services:
1. Implementing and sustenance of Quality activities like 5S, Quality circles etc.,
2. Preparation and maintenance of all ISO documents as per BALCO’s Requirements.
3. Regular Safety and technical trainings for all contractors’ employees.
4. Annual Calibration of Lab Master Instruments and testing equipments (both contractor and BALCO equipments) from a NABL accredited agency.

2.10 Tools & Tackles provided to Contractor Team
Contractor has to keep minimum manpower (for normal maintenance 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.

**Minimum Tools maintained by the Team (but not limited to)**

1. Double end spanner all size - 1 set for 1 technician + Additional 2 Set
2. Ring spanners all size - 1 set for 1 technician + Additional 2 Set
3. Screw Drivers all size - 1 set for 1 technician + Additional 2 Set
4. Digital Millimeters - 1 set for 1 technician + Additional 2 Set (Only Fluke Make)
5. Hacksaw frame and blade - 10 Nos.
6. Allen keys - 1 set for 1 technician + Additional 2 Set.
7. Wire stripper - 1 set for 1 technician + Additional 2 Set.
8. Cable Crimping tools - 10Set + 2Set of hydraulic Crimping tools up to 1000Sqmm.
9. soldering Iron with iron and paste - 5 Nos.
11. Screw Spanners 4 to 12” - 6 set.
12. Files (flat & round) - 10 set.
13. Cutting Player - 1 set for 1 technician + Additional 2 Set
14. Nose Player - 1 set for 1 technician + Additional 2 Set
15. Circlip Player (inner & Outer) - 10 Nos.
16. Paint Brush - 10 Nos.
17. Torch Light with rechargeable battery - 6 Nos.
18. Chain Block - 5 Nos. 10ons.
19. Rope - Depends on job requirement.
20. Tongue tester - 5 Nos.
21. Megger - 5 no’s up to 5KV
22. Tester - 1 set for 1 technician + Additional 2 Set
23. Ferrule & tag printer Printer with all types of consumables : 2 sets
24. All types of Torque wrench: 2 Sets.
25. Tube Bender-1 set all size.
26. Wielding, Grinding and cutting Set: 2 Sets
27. Electrical Operated Torque wrench: 2 sets up to all size.
28. Air gun
29. Vacuum cleaner/blower/hot blower: 2 set big size
30. Extension board: as per site requirement.
31. Tools bag/box 1 set for each technician.
32. Multifunction calibrator.
33. Milli Amp/Volt Source.
34. Portable analyser (O2, Sox, Nox, CO)
35. Portable clamp on flow meter upto 2 meter dia pipe
Consumables: Following list of consumable items to be under scope of vendor (but not limited to)

1. Contact cleaners all type (crc, non crc etc.)
2. Lubricants + Paints
3. Copper tube/flexible tube only for lab purpose
4. Glass Fuse + Terminal Blocks
5. Ferrule/Tag printing consumables.
6. Teflon Tapes + Insulation tapes.
7. Gaskets for valves/flow meters/etc and O- rings
8. Pipe fittings /connectors /ferrules / screws/bolts/nuts etc
9. Buffer solution for PH calibration
10. Lugs up to 25 sqmm all type (Cu &Al) & cable ties
11. Safety gloves/goggle /masks/ear plugs/cleaning cloth etc
12. Calibration gases for analyzers.
14. Cotton waste/marking cloth
15. Ambry paper all type.
16. Yellow/black strip for 5s
17. Flexible copper cable multistrand single core for looping, panel wire, extension board etc. up to 4 sqmm.

SCOPE OF WORK FOR ELECTRICAL MAINTENANCE – 4x135 MW

2. Scope of work:

a. General Technical works:

1. All Routine, preventive, breakdowns, corrective maintenance.
2. Annual over hauling of boiler, Turbine, Generators& excitation systems, Transformers & switchgears, ESP along with their auxiliaries etc.
3. Plan and Carry out scheduled over hauling of all electrical equipment’s in BOP area depending on availability of systems/equipment’s without affecting normal operation of the plant.
4. All modification / up gradation in the existing system including cable laying & related jobs has to be executed by contractor as per requirement of BALCO EIC.
5. Periodicity of PM & routine jobs will be as per the standard practice as agreed by BALCO EIC.
6. Condition based monitoring for all electrical equipment’s as per prudent practice and schedule of BALCO.

7. Preparation of maintenance history for all types of maintenance in Hard As well as soft copy & monthly submission to Balco EIC.

8. Maintaining Equipment History cards for all equipment’s.

9. Periodic updating of spare & consumables requirement as agreed with Balco.

10. Provide reconciliation status of spares on monthly basis.

11. Responsible for security & up-keep of spares & consumable at local stores.

12. All kind of spare materials, equipment’s inside the plant which includes, receiving materials from central stores or directly from vendor and store the same in local stores or site as per instruction from BALCO EIC, and material shifting from site to central stores as required.

b. **Other Services:**

1. Arranging Liaisoning with electrical inspector during the yearly electrical inspection & as and when required. Any required Fee will be paid by BALCO.

2. Implementing and sustenance of Quality activities like 5S, Quality circles etc.,

3. Preparation and maintenance of all ISO documents as per BALCO’s Requirements.

4. Regular Safety and technical trainings for all contractors’ employees.

5. Testing and certifications of all elevators in the plant as per standards.

6. Arranging Periodic calibration (NABL accredited lab or agency approved by BALCO) of all electrical meters, testing kits, measuring equipment’s etc., as per standards both belonging to BALCO or contractor.

7. Arranging all required OEM services on routine and required basis for all critical equipment as mentioned in separate list.

3. **DETAILED SCOPE OF WORK**

i. **GENERATOR & EXCITATION SYSTEM:**

   Maintenance of 168 MVA Generator, Generator cooling system, heaters & Excitation system incl. AVR, excitation transformer, LAPT, NGT, etc.

ii. **220 KV POWER TRANSFORMERS (GT, UAT & ST), IPB DUCT, 6.6 KV BUS DUCT:**

   Maintenance of 220 kV Power Transformers (GT, UAT & ST), 220 KV L.A., Over-head transmission line between GT & ST and Switchyard, IPB Duct, 6.6 KV Bus duct & related auxiliaries.

iii. **PROTECTION SYSTEM (Relays, CT & PT):**

   Maintenance & periodic testing of protection relays, CT, PT associated with Generator, GT, UAT, ST, 6.6 kV & 415 V switchgears. All relays, protection system, power transformer, instrument transformer, VCBs associated in 6.6 kV & above level system must be tested annually and certified by authorized external party. Maintenance, troubleshooting and other rectification of protection wiring inside the plant, between plant and switchyard included in contractor scope.
iv. **6.6 KV / 0.415 kV TRANSFORMERS & RECTIFORMERS**

   Maintenance of all Dry & oil immersed transformers up to 2.5 MVA and Rectiformers of ESP up to 72 KV.

v. **HT, LT & DC MOTORS:**

   All kind of maintenance of Motor at voltage levels from 6.6 kV to 24 VAC as per the scope including all types of i.e. DC, LT & HT motors will be contractor scope. All repairing works in LT motors i) Re-winding of stator ii) Repairing of rotor iii) Repairing of stator end covers iv) Balancing of rotor. BALCO will provide only bearing for maintenance of LT motors. Other items like terminal blocks, terminal lugs, oil seal/ring, NDE side cooling fan, studs of motor stator body, slip ring, carbon brushes for DC motors, various bolts, nuts, keyway repairing, locking key, check nuts etc., and any other items required for repairing/maintenance of LT motors of various voltage levels will be arranged by service provider. Complete repairing of different types of de-watering pumps, slurry pumps used in plant and maintaining their 100% availability all the time. Repairing and fabrication of all LT motor coupling hub in case of any damage or missing of them during maintenance/running will be done by service provider. Checking of wedge tightness of all HT motors has to be done by contractor. Rewinding of Stator/rotor of HT motors, repairing of motor rotor, repairing of HT motor end covers will be done by BALCO. For any damage to any of the parts or full motor of any HT and LT motors due to negligence of electrical maintenance team, then the contractor has to repair / replace the motor/motor part for free of cost.

vi. **OVERHAULING OF HT, LT & DC MOTORS:**

   Decoupling/ Coupling/motor shifting to workshop, overhauling of motor in all respect as per standard, Corrective actions if required to be done. Painting of motors after overhauling has to be done. Contractor has to ensure the availability of all spare motors in overhauled and ready condition.

vii. **6.6KV, 0.415 kV (PCC & MCC) SWITCHGEAR PANELS AND LOCAL CONTROL PANELS**

   Routine, Preventive and breakdown maintenance of 6.6 KV and 0.4 KV switchgear panel and Low voltage panels (Load).

viii. **VFDS, PLC, UPS, DCDB, AVR, DG & Elevator :**

   Maintenance and Trouble-shooting on LV /MV Variable frequency drives, PLCs, UPS, DCDB & AVR, DG, Black Start DG & Elevators (all three i.e Boiler & chimney). Providing technical assistance and man power to any external service engineer who visits the plant as on required basis.

ix. **ESP AND ASH CONVEYING SYSTEMS:**

   Maintenance of ESP fields, related panels, rectifier transformers, all control cards, PCs of operating stations etc.

x. **COMPRESSORS:**

   **TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS**
Maintenance of HT drives of compressors, and its associated LV systems, Compressor room 6.6 KV, 415V switchgears.

xi. **DG SETS:**
Maintenance of both 415V and 6.6 KV Diesel Generator sets (LV and Black start DG sets) and its related switchgears, other electrical equipment’s and installations.

xii. **RAW WATER PUMP HOUSE:**

Maintenance of all electrical equipment’s in raw water pump house which includes all the motors, switchgears and other installations.

xiii. **OTHER SERVICES:**

Maintenance of all electrical installations, building lightings, boundary lighting, street lightings, high mask lightings and power supply systems in SEPCO gate, Gate No-2, Material Gate, weighing bridge at SEPCO gate, COSMOS office, Power plant canteen etc.,

xiv. **CHEMICAL LAB EQUIPMENTS:**

Maintenance of chemical lab electrical instruments like heaters and ovens, pH and conductivity meters, Spectrometers etc.

xv. **DRAWINGS:**

All modification jobs are to be entered in to the master drawings and modified part drawing must be pasted on the respective panel. All modifications carried to be incorporated in the existing drawings. Any drawing development of spares/equipment is in contractor’s scope for the purpose of procurement, or as per EIC requirement.

xvi. **ELECTRICAL INSTRUMENTS/TESTING EQUIPMENTS:**

1. Maintenance & Calibration of all Electrical Lab equipment's, instruments as per the scope.
2. Annual calibration of all energy meters (calibration fees in contractor's scope).

List of testing kit/equipment’s:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name Of the Testing Kit / Equipment</th>
<th>Make</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Earth Resistance Tester – Tinsley</td>
<td>Tinsley</td>
<td>1- 2000 ohm</td>
</tr>
<tr>
<td>2</td>
<td>Earth Resistance Tester - 4015 A</td>
<td>kyoritsu</td>
<td>1- 2000 ohm</td>
</tr>
<tr>
<td>3</td>
<td>AVO Meter - Analog Multimeter</td>
<td>AVO</td>
<td>AC 0.05mA - 10A, 0 - 1000V AC / DC</td>
</tr>
<tr>
<td>4</td>
<td>HV Megger - Tinsley</td>
<td>Tinsley</td>
<td>5000V DC, 0 - 100G ohm</td>
</tr>
<tr>
<td>5</td>
<td>HV Megger - AVO Megger</td>
<td>AVO</td>
<td>5000V DC, 0 - 100G ohm</td>
</tr>
<tr>
<td>6</td>
<td>HV Megger - JD2705A</td>
<td>CMC</td>
<td>5 KV</td>
</tr>
<tr>
<td>7</td>
<td>relay Current Injection Kit - PW 40A</td>
<td>PATCL</td>
<td>0 - 10A</td>
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<tr>
<td>8</td>
<td>relay Current Injection Kit –</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Brand</td>
<td>Specifications</td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------------------------</td>
<td>-----------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>9</td>
<td>Primary Current Injection Kit - 100A</td>
<td>China QLC</td>
<td>1 - 100 A</td>
</tr>
<tr>
<td>10</td>
<td>Primary Current Injection Kit - 1000A</td>
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<td>0 - 1000A</td>
</tr>
<tr>
<td>11</td>
<td>Circuit Breaker Timing Kit</td>
<td>GKC</td>
<td>0.1 - 999msec, 1 - 600mm</td>
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<tr>
<td>12</td>
<td>Circuit Breaker Timing Kit</td>
<td>Scope</td>
<td>6.6KV - 440KV</td>
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<tr>
<td>13</td>
<td>DC High Voltage Testing Kit</td>
<td>Chinese</td>
<td>0 - 50mA, 0 - 20KV DC</td>
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<tr>
<td>14</td>
<td>AC High Voltage Testing Kit- Main Kit</td>
<td>TCWJH</td>
<td>10KVA, 0 - 50kV AC</td>
</tr>
<tr>
<td>15</td>
<td>AC High Voltage Testing Kit- 50KV</td>
<td>GYD</td>
<td>0 - 50kV</td>
</tr>
<tr>
<td>16</td>
<td>AC High Voltage Testing Kit- 10KV - 10KVA</td>
<td>GYD</td>
<td>0 - 10 Kv</td>
</tr>
<tr>
<td>17</td>
<td>Transformer Voltage Ratio Test kit</td>
<td>CMC</td>
<td>0.999 – 2000</td>
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<tr>
<td>18</td>
<td>Transformer Resistance Meter</td>
<td>CMC</td>
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<td>19</td>
<td>Transformer Wdg. Resistance Meter</td>
<td>Scope</td>
<td>800 m ohm-2000 ohm, 10mA-25A</td>
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<td>20</td>
<td>TAN Delta Kit</td>
<td>JDCMC</td>
<td>0 - 10 kV</td>
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<td>21</td>
<td>CB Contact Resistance Meter</td>
<td>Scope</td>
<td>200 micro. Ohm - 20 m ohm</td>
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<td>22</td>
<td>Power Analyzer</td>
<td>CMC</td>
<td>0 - 500V, 0 - 2000V AC</td>
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<td>23</td>
<td>Power Analyzer</td>
<td>Chauvin Arnoux</td>
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<td>24</td>
<td>Multi-range AC V / A Meter</td>
<td>N/A</td>
<td>0 - 600V, 0.03 - 30A</td>
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<tr>
<td>25</td>
<td>Multi-range DC mV/ mA Meter</td>
<td>CMC</td>
<td>mA</td>
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<tr>
<td>26</td>
<td>Digital Millimeter Fluke</td>
<td>Fluke</td>
<td>0 - 600V / 1000V</td>
</tr>
<tr>
<td>27</td>
<td>Single Phase Voltage Regulator</td>
<td>HUYU</td>
<td>0 - 250V, 0 - 2KVA</td>
</tr>
<tr>
<td>28</td>
<td>3 Phase Voltage Regulator (4 Amps)</td>
<td>HUYU</td>
<td>0 - 430V, 3KVA</td>
</tr>
<tr>
<td>29</td>
<td>CB Contact Resistance Meter</td>
<td>Jindi</td>
<td>0.1 micro ohm - 60 m ohm</td>
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<tr>
<td>30</td>
<td>mA/mV Source and Calibrator</td>
<td>GOSSEN METRAWATT</td>
<td>0 - 20 mA/ 0 - 300 mV</td>
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<tr>
<td>31</td>
<td>Loop Calibrator</td>
<td>Toshanwal Industries</td>
<td>0 - 20 mA</td>
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<tr>
<td>32</td>
<td>Digital Clamp Meter</td>
<td>Motwane</td>
<td>400mV-1000V, 200 uA-1000A</td>
</tr>
<tr>
<td>33</td>
<td>Digital Multimeter</td>
<td>Motwane</td>
<td>0-10A DC, 200 mV- 1000V</td>
</tr>
<tr>
<td>34</td>
<td>High Voltage Probe</td>
<td>Motwane</td>
<td>5-25 kV DC, 10-25 kV AC</td>
</tr>
</tbody>
</table>
35  Digital Multimeter  Motwane  200 mV-1000 V, 200uA-10A,200ohm-20 Mohm
36  Digital Clamp Meter  Motwane  200 uA-10A
37  Digital Multimeter  CMC  0-10A DC, 200 mV- 1000V

xvii. CONDITION MONITORING & ASSESMENT OF ELECTRICAL EQUIPMENTS:

Condition Monitoring & health assessment of major & critical electrical Equipment’s, viz. Generator, HT motors, LT motors as per BALCO’s requirement, HV Power transformers, LV oil immersed transformers, as below –

A. Diagnostic testing on Transformers -
   1. Tan-delta
   2. Magnetizing Current Test
   3. Winding resistance
   4. Magnetic Balance
   5. Sweep Frequency Response Analysis
   6. DGA of Transformer oil
   7. BDV testing of all transformer oil
   8. Furan content test in Transformer oil
   9. Insulation Resistance

B. Diagnostic testing on Motors -
   1. Vibration Analysis
   2. Motor Current Signature Analysis

C. Earthing System-
   1. Maintenance of Earth pits of all electrical installations,
   2. Testing of above mentioned earth pits and updating the name plate details with standard colour paints ( has to be arranged by contractor),
   3. Maintaining maintenance and testing records of all earth pits.
   4. Preparation of new earth pits or treating of earth pits as on required / as per EIC of BALCO.

Other common condition monitoring activities like thermo graphic analysis has to be carried out by contractor as per requirement of BALCO EIC.

D. Relay & Protection System-
   1. Testing of relays. Instrument transformer in 6.6 KV and above voltage level system
   2. Testing of VCB for vacuum contact resistance, IR, timing tests etc.
3. Testing of 415 volt incomer breaker, bus coupler, breakers of all PCC, MCC and associated relays and CT PT
4. Testing of CT, PT, CVT etc

- Hard copy Reports of tests mentioned above is to be submitted to Balco & corrective actions is to be taken by contractor based on the reports in consent with Balco.
- Monitoring and Maintaining all parameter data of all critical equipment like Generator, GT, UAT, MV VFD, AVR, 6.6 KV PCC, Protection Panel, Energy meter etc.

xviii. Break Down failure & Root Cause Analysis Report:

For any type of breakdown contractor must be submit a failure analysis report and RCA within 24 hours with proper justification.

xix. Safety & 5S:

Contractor Participation must be 100% in 5S, Quality circles & plant safety related activities like HI/HE etc. throughout the year. All employees must be wearing proper PPE as per requirement.

xx. AUXILIARY SUPPORT:

Routine, Preventive & break down maintenance of auxiliary support equipment’s such as:
1. EOT, Monorail, Gear cranes, Hoists & Elevators.
2. Electrical Protection & control system - 220 kV, 6.6 kV and 0.415 kV.
3. Plant & boundary lighting in the area of around 3-4 Sq Km including chimney lighting.
4. Air ventilation of system for plant & offices.
5. Comprehensive maintenance of Air conditioners, water coolers and purifiers and related equipment in whole plant area including Main Plant, CHP, AHP, Material gates, canteen & offices premises which includes consumables and low value spare items up to INR 1000 of unit price up to maximum total cost of INR 5000 per month.
6. Painting of all electrical equipment, panels and other accessories as required or as per EIC requirements by arranging required colour and grade of paints with qualified painter. Paint will be provided by BALCO.
7. Service provider will ensure 24 hrs availability of vehicles required for transportation of spares like hydra, pickup/camper, tractor etc., Also they will arrange for heavy utility truck, high capacity hydra / crane etc., as on required within 2 days after intimation from EIC of BALCO.

5. TOOLS & TACKLES IN CONTRACTOR’S SCOPE:
1. Tools for all HT & LT motors shifting & overhauling like Wire Rope, Chain block, Hydraulic Jack, Bearing pullers, bearing heaters, Eye bolts etc. All lifting tools must have third party certificate for their healthiness and as per statutory requirements.
2. Tools & machine for welding & gas cutting work, Drill M/C with drill bits, Tap sets up to 8 mm, Filler gauges, screw gauges, Werner calliper etc.
3. DG set welding M/C as whenever required.
4. Adequate no of Measuring quality instruments like Digital multimeters (minimum 10 no’s to be maintained), AC & DC Clamp on meters, Insulation testers – 500V , 2.5 KV, 5 KV Motor Checker, 04 sets of Box Spanner sets, Hydraulic Crimping tool up to 1000 Sq mm., 05 no of manual Crimping tools up to 16 Sq mm, 03 Kits of Electrician tools of Everest / Taparia make, soldering iron, De-soldering pump, pipe wrench 300 mm , etc. files of all types & sizes.
5. All the electrical technician groups (Comprising of 01 technician + 01 helper) should be equipped with minimum tools e.g. Tester, Digital multimeter, Combination Pliers, Nose Pliers, Screw driver set, wrench spanner 150-250-300,Allen Key set, D & RING Spanner set, Star screw drivers etc. with a tool bag.
6. Portable EARTH discharge rods at least 06 confirming the standards & tests for 6.6 kV & 220 KV systems.
7. Other supporting electrical appliances like halogen lamps, Hand lamps, torch, extension boards to be maintained in working condition for any requirements anywhere inside the plant.

5. **CONSUMABLES IN CONTRACTOR’S SCOPE:**
   1. Cleaners & consumables related to motor overhauling & bearing replacements i.e. bearing retainers, Diesel, Red insulation varnish, Locktite.
   2. Emery roll, sand paper, Drill bits, Hack saw blades, Emery paper necessary tape (PVC/Para/Empire/Fiber-glass/Glass mica/Cotton, Teflon), cotton waste, cotton cloth, Petrol, Kerosene, Diesel, CRC-226, Rustoline, CTC, panel cutter ,lugs, HT and LT insulation tapes, soldering iron, de-soldering pump, test board, 24V hand lamp with transformer and all cleaning elements etc., shall be in the Contractor scope.
   3. Electrical Contact Cleaners, Acetone, Pen Oil, CRC, Electronic component cleaner, Polythene, Tarpaulin, Petrol, Petroleum jelly etc will be in Contractor’s scope.
   4. Welding & gas cutting consumables like electrodes, gas cylinders etc.
   5. All general type of seals, Rings, Anna bond, Locktite and related consumables will be in Contractor’s scope.
   6. All consumables including small spares like washer, small screws, bolts and nuts of size up to12 x 75 mm and all HT/LT Cu/Al. lugs , printed ferrule etc.
   7. Cooling fans of different sizes for all LT motors inside the plant to be supplied by contactor.
   8. **Terminal Blocks of all LT motors has to be supplied and maintained by contractor.**
7. **ANNUAL OPERATING PLAN:**

1. The Contractor shall maintain, make recommendations and update Spare Parts lists from time to time during the Term in consultation with the Owner.
2. Projected yearly budgetary requirements for the subject matter.
3. On or prior to thirty (30) days of each Contract Year (however within 120 days in the first Contract Year), the Contractor 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.
4. Expected operations, repairs, capital improvements, teardowns and major overhauls, Routine maintenance and overhaul schedules;
5. Data regarding other work proposed to be undertaken by the Contractor.
6. In preparing and providing the Annual Operating Plan, the Contractor shall apply the prudent standards of performance and make such plans consistent with the availability requirements in this Agreement.
7. Upon receipt of comments from the Owner on the Annual Operating Plan, the Contractor shall incorporate the Owner’s comments, discuss and resolve any differences, and on or prior to the date that is fifteen (15) Days following the receipt of Owner’s comments prepare and submit to the Owner a final Annual Operating Plan.
8. Any actions proposed under the Annual Operating Plan shall be consistent with the O&M Procedures and the Contractor's obligations set forth in this Agreement. The Contractor shall notify the Owner as soon as reasonably possible of any significant deviations or discrepancies from the projections contained in the Annual Operating Plan.
9. In reviewing, commenting upon and approving the Annual Operating Plan including the Contractor’s recommendations with respect to the procurement of Spare Parts,

**Min Tools and Tackles Requirement**

<table>
<thead>
<tr>
<th>NAME / DETAILS OF TOOLS/TACKLES</th>
<th>QTY/QLTY OF TOOLS/TACKLES AS PER CONTRACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIRE ROPE - 3T / 5T / 10T</td>
<td>2 nos in each</td>
</tr>
<tr>
<td>CHAIN BLOCK - 3T / 5T / 10T</td>
<td>1 in each</td>
</tr>
<tr>
<td>HYDRAULIC JACK - 5T</td>
<td>2 nos</td>
</tr>
<tr>
<td>BEARING PULLER - Standard Jaw / Heavy Duty Jaw type</td>
<td>1 in each</td>
</tr>
<tr>
<td>BEARING HEATER - Medium Induction - upto 120 Kg</td>
<td>1 Nos</td>
</tr>
<tr>
<td>EYE BOLTS - of all type / size</td>
<td>As per requirements. To be arranged in 1-2 days</td>
</tr>
<tr>
<td>TESTER</td>
<td>Each Technician</td>
</tr>
<tr>
<td>DIGITAL MULTIMETER</td>
<td>min 10 nos / Each technicians + Helpers</td>
</tr>
<tr>
<td>AC CLAMP METER</td>
<td>Min 2 nos</td>
</tr>
<tr>
<td>DC CLAMP METER</td>
<td>Min 2Nos</td>
</tr>
<tr>
<td>Item Description</td>
<td>Quantity</td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>INSULATION TESTER (upto 2.5 KV)</td>
<td>Min 1 Nos</td>
</tr>
<tr>
<td>INSULATION TESTER (upto 5 KV)</td>
<td>Min 1 Nos</td>
</tr>
<tr>
<td>BOX SPANNERS’ SET</td>
<td>Min 4 Sets</td>
</tr>
<tr>
<td>SCREW DRIVERS SET</td>
<td>Each Technician</td>
</tr>
<tr>
<td>WRENCH SPANNER 150 - 250 - 300</td>
<td>Each Technician</td>
</tr>
<tr>
<td>CUTTING PLIER</td>
<td>Each Technician</td>
</tr>
<tr>
<td>NOSE PLIER</td>
<td>Each Technician</td>
</tr>
<tr>
<td>D AND RING SPANNERS SET</td>
<td>Each Technician</td>
</tr>
<tr>
<td>PANEL CUTTER</td>
<td>1 Nos</td>
</tr>
<tr>
<td>WELDING MACHINE</td>
<td>1 Nos</td>
</tr>
<tr>
<td>GAS WELDING SET</td>
<td>1 Nos</td>
</tr>
<tr>
<td>HAND DRILL MACHINE</td>
<td>1 Nos</td>
</tr>
<tr>
<td>TAP SET (UP TO 8 mm)</td>
<td>1 Nos</td>
</tr>
<tr>
<td>FILLER GAUGE</td>
<td>1 Nos</td>
</tr>
<tr>
<td>SCREW GAUGE</td>
<td>1 Nos</td>
</tr>
<tr>
<td>VERNIER CALIPER</td>
<td>1 Nos</td>
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<tr>
<td>ELECTRICIANS TOOLS SET</td>
<td>3 sets</td>
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<tr>
<td>SOLDERING IRON</td>
<td>3 sets</td>
</tr>
<tr>
<td>DESOLDERING PUMP</td>
<td>3 sets</td>
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<tr>
<td>PIPE WRENCH (300 MM)</td>
<td>3 sets</td>
</tr>
<tr>
<td>FILES OF ALL TYPES / SIZE</td>
<td>3 sets</td>
</tr>
<tr>
<td>MANUAL CRIMPING TOOLS (UP TO 16 SQ MM)</td>
<td>5 nos</td>
</tr>
<tr>
<td>HYDRAULIC CRIMPING TOOLS (UP TO MIN 1000 SQ MM)</td>
<td>1 Nos</td>
</tr>
<tr>
<td>EARTH discharge rods</td>
<td>Min 6 nos with standards for 6.6 KV and 220KV</td>
</tr>
<tr>
<td>halogen lamps</td>
<td>5 sets with proper cable of 10 meter length</td>
</tr>
<tr>
<td>hand lamps</td>
<td>5 sets with proper cable of 10 meter length</td>
</tr>
<tr>
<td>torch</td>
<td>3 nos</td>
</tr>
<tr>
<td>Industrial Extension boards with ELCB / RCCB</td>
<td>5 sets with proper cable of 10 meter length</td>
</tr>
</tbody>
</table>

**Consumables – minimum stock / requirement:**

<table>
<thead>
<tr>
<th>S.No</th>
<th>NAME / DETAILS OF CONSUMABLE</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>24V hand lamps with Transformer</td>
<td>5 nos</td>
</tr>
<tr>
<td>2</td>
<td>Acetone</td>
<td>3 Lt</td>
</tr>
<tr>
<td>3</td>
<td>All General type Rings</td>
<td>Min 3 nos / to be arranged in 1-2 days</td>
</tr>
<tr>
<td>4</td>
<td>All General type Seals</td>
<td>Min 3 nos / to be arranged in 1-2 days</td>
</tr>
<tr>
<td>5</td>
<td>All HT/LT Lugs (both Al and Cu, heavy duty)</td>
<td>Min 12 nos in each size</td>
</tr>
</tbody>
</table>

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Anabond</td>
</tr>
<tr>
<td>7</td>
<td>Anti - Tracking spray</td>
</tr>
<tr>
<td>8</td>
<td>bearing retainers</td>
</tr>
<tr>
<td>9</td>
<td>Cleaners</td>
</tr>
<tr>
<td>10</td>
<td>Contact Cleaners</td>
</tr>
<tr>
<td>11</td>
<td>Cooling Fans for all LT motors</td>
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<tr>
<td>12</td>
<td>cotton cloths</td>
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<tr>
<td>13</td>
<td>cotton tapes</td>
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<tr>
<td>14</td>
<td>cotton wastes</td>
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<tr>
<td>15</td>
<td>CRC-226</td>
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<tr>
<td>16</td>
<td>CTC</td>
</tr>
<tr>
<td>17</td>
<td>Diesel</td>
</tr>
<tr>
<td>18</td>
<td>Drill bits</td>
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<tr>
<td>19</td>
<td>Electronic Component Cleaners</td>
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<tr>
<td>20</td>
<td>Emery roll</td>
</tr>
<tr>
<td>21</td>
<td>Empire Tapes</td>
</tr>
<tr>
<td>22</td>
<td>Ferrules</td>
</tr>
<tr>
<td>23</td>
<td>fibreglass tapes</td>
</tr>
<tr>
<td>24</td>
<td>Glass mica tapes</td>
</tr>
<tr>
<td>25</td>
<td>Hack saw blades</td>
</tr>
<tr>
<td>26</td>
<td>HT insulation Tapes</td>
</tr>
<tr>
<td>27</td>
<td>LT insulation Tapes</td>
</tr>
<tr>
<td>28</td>
<td>Kerosene</td>
</tr>
<tr>
<td>29</td>
<td>Locktite</td>
</tr>
<tr>
<td>30</td>
<td>Other cleaning elements</td>
</tr>
<tr>
<td>31</td>
<td>Panel cutters</td>
</tr>
<tr>
<td>32</td>
<td>Pen Oil</td>
</tr>
<tr>
<td>33</td>
<td>Petrol</td>
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<td>34</td>
<td>Petroleum Jelly</td>
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<tr>
<td>35</td>
<td>Polythene</td>
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<tr>
<td>36</td>
<td>PVC Tapes</td>
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<tr>
<td>37</td>
<td>Red insulation varnish</td>
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<tr>
<td>38</td>
<td>Rustoline</td>
</tr>
<tr>
<td>39</td>
<td>sand paper</td>
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<tr>
<td>40</td>
<td>Tarpaulin</td>
</tr>
<tr>
<td>41</td>
<td>telfon tapes</td>
</tr>
<tr>
<td>42</td>
<td>Washer, screws, Bolts, nuts</td>
</tr>
<tr>
<td>43</td>
<td>Welding Electrodes</td>
</tr>
<tr>
<td>44</td>
<td>Welding Gas</td>
</tr>
</tbody>
</table>
SCOPE OF WORK FOR O&M OF AHP/CHP – 4x135 MW

CHP/AHP Area, system and associated sub system:-

Track Hopper area top to bottom (Paddle Feeder to bunker floor) Coal Feeding systems including Stacker cum Reclaimer, screen, crusher, DE System, DS system connected with conveyor, Coal Yard, vibro feeder, vibrating screen, ILMS, ventilation system, sump pumps, sampling system, dynamic circle chain, Emergency Bin, transfer towers and conveyors, bulk remover and buffer drum system, hoist system, interconnection with 540, BOBRN Compressor house, CHP control room, plough unloader-diverter system, auto Coal Sampler etc.

Ash Handling Plant from bottom of ESP field 1,2 & Bag filter field 3,4 &5 (knife edge gate valve) vessel/isolation valve to silo to ash dyke & bottom ash scraper chain conveyor to Ash dyke including Economizer hopper/APH hopper to complete discharge point up to Ash Pond including GEHO Pumps, Dry Ash Conveying system, Silo, Bag Filter of silo, ART, screw conveyor, Submerged Scrapper Chain Conveyor, Ash Slurry Pump and system, Clinker Grinder, Dewatering Bin, Weigh feeder, Conveyor, Fresh Water, settling tank Pond and HP LP Pumps, BAWR system, AHP air Compressor, dryer, Blower, heater, Fire Fighting and PLC Monitoring system, all control room of AHP & CHP etc.

System Over view:-

Coal will come in wagons/trucks, which will be unloaded by coal unloading agency at track hopper. Coal evacuate from track hopper with four number of paddle feeder. Two streams of belt will take this coal either to bunker or yard. One stacker and reclaimer will perform stacking and reclaiming. There is an interconnection with CPP 540 also which can be used in emergency through flap gate and plough feeders

Compressors are available for BOBRN unloading.
Fly ash conveying is available from ESP/AHP/ECONOMIZER hoppers to silo through compressed air. Bottom ash will be conveying to DB through SSC and ash slurry pump.
Bottom ash and fly ash to be dispose to ash pond through HCSD system. Ash bulker or open truck ash disposal are also possible. Compressors are available for fly ash conveying.

For each activity various measuring instruments and remote PLC /HMI control system along with Local control panels are available.

CHP MV switchgear contains two 6.6kV bus sections with bus-coupler and is charged through two sections from 6.6kV station switchgear. CHP switch gear feeds 2X2MVA (6.6/0.415kV) Transformer to meet LV loads, Two numbers stacker cum reclaimers, eight numbers HT Motors and spare 6.6kV feeder.
AHP PCC is charged through two source breaker from station switchgear through 2 X 2MVA (6.6/0.415 kV) transformer carrying load of Silo MCC, HCSD MCC, FOPH MCC, Sewage MCC.
**Scope of Work for CHP (Operation) – 540 MW**

O&M Agency shall be responsible for entire Operation of Coal Handling Plant. The brief scope of work is outlined below.

- Operation of all equipment from bottom of track hopper/ Dozing point of truck hopper area BOBR Compressors/ Hoists/sprinkling systems / conveyor belt safe guard ) to Boiler Bunker for both bunkering path & Stacking/reclaiming path.
- Stacking, feeding & dozing of coal from truck hopper top to boiler bunkers/coal yards. O&M of all equipment from truck hopper top, Vibro feeders, conveyor belts, chute, CBMS (cross belt magnetic separator), ventilation fan etc.
- Stacking & Feeding of coal from coal yard to Boiler Bunkers as per the ‘Mix’ required by BALCO from time to time through stacker & reclaimer and inclusive management of all coal yards (As per EIC instructions).
- Dozers (3 nos.) required for yard management would be provided by service provider. Dozer Maintenance Shed, Fuel, will also be provided by BALCO. Operation and Maintenance of Dozer is under scope of Service Provider. 24 Hrs skilled dozer operators to be provided by service provider.
- Manual Water Injection through hose pipes in coal heaps of all coal yards to prevent fire in coal, helping fire service in case of any fire incidents in CHP will be done by Service Provider. Service provider to ensure zero incidents of fire caused by coal in all CHP area.
- Sprinkling to be done during summer for coal yards.
- Service Provider will supervise all the movement of truck inside plant for shifting of coal from one area/yard to other area/yard/ dozing point and to supervise the movement/unloading of coal received by trucks at the coal yard. Service Provider to ensure proper management of coal yard such as stacking, reclaiming and proper heap preparation as per the requirement of Balco. All Yards/Heaps/areas is to be prepared for PV by 25th of every month. All loose material to be charged, stones to be arranged as per direction of EIC
  - Service Provider will be assisting the coal PV by providing manpower, one shovel (belcha) and bucket welding as required by EIC at the time of PV.
  - All equipment in CHP area shall be operated as per the SOP and the instruction of EIC.
  - Service Provider to ensure 95% availability of all DE & DS system. Coal Dust Bag Hopper in entire CHP area is to be drained on daily basis and is to be fed on belt/to be shifted to any location inside Plant as per instruction by EIC.
  - Stone Picking from Conveyors on continuous basis in all three shifts in a day is to be done by Service Provider.
  - Service Provider has to ensure zero foreign particles in coal charged to Bunkers.
  - As and when required, continuous hammering and cleaning of paddle feeder, transfer chutes is in scope of Service Provider. Manpower of same has to be arranged by service provider as and when required for this job. All necessary tools required for this job are to be provided by Service Provider.
  - Electrical work like lighting, AC in weigh bridge which is related to coal handling plant inside the premises will be in the scope of service provider.
  - Electric work in auto sampler, coal sampling room & and worker rest room will in scope of service provider.
  - All related maintenance (Mechanical, electrical) of coal sampling preparation equipments (Jaw crusher, Pulverizer) will be in the contractor’s scope. Spares of equipment will be provided by BALCO.

**Scope of work for Operation of AHP – 540 MW**

O&M Agency shall be responsible for entire Operation of Ash Handling Plant.

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**TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS**
The brief scope of work is outlined below.

- Operation of all Mechanical, Electrical, Instrumentation equipment of dry ash system of bottom of ESP field 1, 2 & Bag filter field 3, 4 & 5 (knife edge gate valve) vessel/isolation valve (Including APH & ECO Hopper/Vessels) up to Silo and Ash dyke, wet Ash system from boiler bottom scraper chain conveyor to Ash Dyke, associated equipments such as blower, GEHO, HP-LP Pumps, slurry pumps, submerged scraper chain conveyor etc.
- O&M of level probe, fluidizing pad, vent line from vessel to hopper of ESP/Bag filter will be in the scope of service provider
- Operation of ash conveying from of bottom of ESP field 1, 2 & Bag filter field 3, 4 & 5 (knife edge gate valve) & GEHO pump PLC or local panel is in contractor’s scope.
- Silo unloading operation is in contractor’s scope.
- Periodic cleaning of Ash Silo filters bags as and when required.
- Supply of Hose pipe for water spraying & Air blowing in AHP area is in contractors scope. Cleaning frequency should be scheduled on daily basis.
- Ash should not accumulate on ESP trench, Surface water trench & storm water drain (surrounding the Ash handing plant), cleaning the same is in contractor’s scope.
- Ash evacuations from all ECO hoppers (4 Nos.), APH hoppers (8 Nos.), ESP hoppers (8 Nos.) & Bag filter hoppers (12 Nos.) in each unit are in contractor’s scope.
- During annual overhauling, cleaning of bottom Ash sump pit of all the units are in contractor’s scope.
- Yearly cleaning of fresh water tank, settling tank and GEHO mixing tank is in contractor’s scope.
- Weekly cleaning of sump pits at a) Bottom of silo, b) GEHO pump area, c) Near fresh water tank, d) Bottom of ESP area are in contractor’s scope.
- Fresh water tank level control has to be done to avoid overflow of water.
- GEHO pump discharge pipe line inspection and area cleaning (grass cutting) as per need of maintenance.
- Discharge Ash density to be controlled as instructed by EIC.
- DE System operation on silo top is in Contractor’s scope.
- Total two nos. of mobile phones should be provided by contractor (one for operation in charge & another for shift in charge) for better communications with other departments.
- Each and every equipment should be in cleaned condition.
- Only Routine maintenance of fire fighting system (fire hydrant, delude valve spray system, fire alarm & detection system) in CHP & AHP area will be in the scope of service provider.
- All ASH handling & BOBRN compressors (14 nos. for ASH conveying, 2 nos. for BOBRN, small compressors for dust extraction system).
- (If residual ASH generated due to operation problem then removed by service provider).
- O&M of 2 nos. Outside ash silo (near SEPCO gate) & their related system will be in the scope of service provider.
- Rotation of GEHO discharge pipe line of outside of the plant will be in the scope BALCO. Supervision will be in the scope of service provider.
- Regular maintenance and assistance during trial of firefighting and alarming system (in CHP/AHP area only)
Scope of Work for Mechanical Maintenance of AHP/CHP – 540 MW

O&M Agency shall be responsible for Mechanical Maintenance (Preventive, Predictive, Corrective, and Breakdown) of CHP/AHP. The brief scope of work is outlined below (but not limited to).

- Maintenance of all Mechanical equipment in AHP/CHP area of 540 MW.
- The Scope includes Cold Vulcanizing of Conveyor belts
- Additional resources / manpower if required during emergency and in major breakdown to be arranged by the contractor to complete the job on time.
- Temporary plant form/scaffolding for maintenance work except Dewatering Bin is in service provider scope.
- Contractor has to do condition based monitoring as per best maintenance practices (vibration analysis, oil analysis etc CBM activities to be carried out with proper schedule, analysis reports to be submitted. Frequency will be once in a month.)
- Healthiness of standby and spare equipment to be ensured. Spares required for repair work will be provided by BALCO. Spare forecasting is to be given by the contractor time to time.
- Supply of general Purpose O&M Consumables will be in contractor’s scope.
- Sufficient tools and tackles to be provided for Operation and Maintenance activities.
- O&M Contractor has to maintain track hopper and vibro feeder (c#3/c#9) grill & gallery repairing/ replacement job.
- Pipe line laying/replacement job in CHP/AHP area.
- Any steel fabrication/ modification job which is required to improve the availability and reliability of the system in CHP and AHP.
- Pulley lagging job in all conveyor pulleys
- Replacement of filter bags on Ash Silo as and when required and replacement of fluidizing pad of the bottom of ESP hopper & vessel.
- Service provider has run leakage prevention activity rigorously. These activities include leakage of water, coal, ash, compressed air, oil in entire CHP/AHP area and for all equipment and structures (hopper, silo, pipe lines etc)
- Regular maintenance and timely PM (preventive Maintenance) of dewatering bin with its complete maintenance such as decanter pipe replacement.
- Overhauling will be done by OEM, necessary man power support shall be given by service provider. For the equipment of GEHO, Pumps, Hydraulic System, Stacker cum reclaim, compressors, Dozers etc. OEM/EXPERT services will be required
- Boiler bottom ash trench maintenance in contractor’s scope.
- AHP related Valves minor welding work and inside the plant transportation like BALCO work shop to and fro will be in service provider scope. Inside the plant machining will be done by BALCO at their work shop. Any kind of machining of the valve outside the plant will be done by service provider.
- Geho pump discharge line replacement & rotation work inside/outside/upto ash dyke is in scope of contractor’s scope according to De-metering.
- De-metering of pipe line (Thickness measurement of GEHO discharge line) at least once in a year is in contractor’s scope (if required partial De-metering of GEHO...
or other lines of AHP to be done before plant shutdown).
In existing pipe line (fly ash, bottom ash, water line) any bends or a length of pipe to be repair/replaced due to erosion will be in the scope of service provider.
- Online sealing of any leakage (if pipeline isolation is not possible) is in contractor’s scope. ESP Hopper fluidizing pad maintenance and replacement is in contractor’s scope.
- Due to any fault in the system with respect to material failure and unavailability of spares/mechanical isolation of line (dummy) is in contractor's scope.
- Service provider has to do every maintenance job and OEM Service engineer’s visits to be organized by service provider.
- Chute repairing like patching will be in contractor scope.

Scope of Work for ELECTRICAL & C&I Maintenance of AHP/CHP - 1200MW

O&M Agency shall be responsible for Electrical and C&I Maintenance (Preventive, Predictive, Corrective, and Breakdown) of CHP/AHP. The brief scope of work is outlined below (but not limited to).
Preventive, predictive, shutdown and breakdown maintenance for entire AHP/CHP areas equipments - instruments and their internal /accessories.

Up keep of all the electrical and C&I PLC /SCADA/HMI, AB VFD, ABB VFD etc. Agency will have to tie up with OEMs (Allen Bradley, Siemens etc) for maintenance of PLC. however OEM Service engineer’s visits to be organized by service provider.
Regular collection of logic and graphics backup, upkeep of logic. Communication checking, data transfer, collection, loop and continuity check. Modification, forcing and bypassing not allowed. (Without getting it approved through Change Order note - system. In emergency if such activity if required must be done with written consent of Balco engineer. Any alteration (Hard/soft) can only be done by written consent of BALCO Engineer in charge.

- Condition monitoring of control system and instruments.
- Calibration of belt scale by external agency Quarterly.
- Upkeep of all the IT equipment provided by Balco (PC/IP phone/Network switch etc)
- Maintenance of Nucleonic density meter in GEHO Pump discharge line.
- Maintenance of Motor, pump, actuator and rewinding/ repair of the same is Contractor scope.
- Spare forecasting and consumption report, reconciliation status.
- Upkeep of indoor and outdoor panel
- Rain and dust proofing of outside instruments and panels.
- Replacement of Control & power cable laying, jointing, lugging ,termination/tray laying, dressing ferruling as and when required
- Earth Pit maintenance, Maintenance of Equipment earthing.
- Upkeep of OFC network and communication up to BTG CCR. Upkeep of HME/SCADA/Server in main BTG CCR related to CHP & AHP.OFC cable splicing if required.

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
• Maintenance of Master calibration instruments related to CHP/AHP provided by BALCO. Routine and Breakdown maintenance of lab facilities like MCB’s Sockets, Heaters and Owens, etc. LHSC cable maintenance.

• Maintenance of Public Annunciation System

• All kind of testing of existing Transformers/ HT Motors. Testing of HT Motors with Megger (Megger make HT & LT insulation tester, Fluke multi meter will be in contractor scope). Hipot test will be done by service provider ( Kit will be provided by BALCO) control and power cable laying, cable termination, cable jointing is in service provider scope as per maintenance practice/SMP.

• Vibration and Displacement Checks as per need with kit will be in service provider scope.

• CBM of HT/LT motor which includes cleaning, checking, repairing, replacement/ topping of lubricant, Bearing heating/ removal/ replacement, removal/ fixing of motor earthing, rotar removal and thread in; tightness checking of terminal connection, lugging and crumping of controle and power cables; varnishing of stator, checking of stator wedge tightness, rewedging , replacement of motor; checking, testing and replacement of winding and bearing RTDs, Circuit Breaker or starter operations, earth connections , control and power cable laying & termination, cable jointing. Jointing kit will be provided by BALCO.

• Maintenance of EOT, Monorail, Hoists along with Tightness checking of pantograph, termination of control and power cable, laying & jointing, limit switch checking and adjustment.

• 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. Same will be provided by BALCO.

• Exhaust fans Replacement in CHP/AHP area. Spares will be provided by BALCO

• Lightening arrester checking and testing of CHP/ AHP area. All type of ladders and approach to work at heights/street lights to be arranged by O&M service provider.

• Maintenance of HVAC System including window AC, split AC and Centralized air conditioners, water coolers and purifiers of CHP-AHP area and offices. Cleaning, checking, repair and replacement of Air filters/ fans/ replacement of compressor replacement and jointing of copper pipe { Copper pipe will be provided by BALCO } AC control circuit checking and replacement of cards.

• Testing of all lifting tools & tackles and certificate of fitment once in year.

• Liaisoning along with cost incurred with Electrical inspector will be under the scope of the contractor and the actual cost will be reimbursed from BALCO.

Scope of Work Common for Operation and Maintenance of AHP/CHP (Every Department)

Maintenance of all equipments for amenities like A/Cs, Water coolers, Offices,Labour Shed,etc in AHP/CHP is in contractor’s scope. All type of piping and plumber related work will come under contractor scope.

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
O&M Agency has to follow all standards for ISO systems. Service provider has to prepare documents related QMS, OHSAS, EMS, and any other data or document as required for any internal and external audits to be conducted in BALCO. Report generation and documentation ( FAR/ daily/ monthly/ safety/ history/ RCA/FMEA etc.) SAP to be used for PP, PM and MM modules. Filled logbook duly signed by the supervisor should be submitted to BALCO engineers daily. However the completed log book should be handed over to BALCO for future reference. Daily report preparation & reporting to be done to respective EIC and all HOD’s in BALCO prescribed format and methods.

At the end of all shifts, feedback for progress of work and plan for next day is to be discussed and submitted in writing. Shift wise operational reporting, Preparation of shift logbook, filling of data sheet, check list and all other relevant stationeries required for the job is to be provided by service provider.

Shifting, Loading, Unloading of materials inside the plant premises such as, movement from store/workshop to workplace, central store to local store, and vice versa, with arrangement of hydra, lifting tools and suitable vehicle will be in contractor scope. Assistance for material inspection at site/store.

Sufficient and skilled Manpower (In-charge, Engineer, Supervisor, Operator, Helper, Technician, Draftsman, Welder, Fitter, Rigger, Safety officer) to be provided for Operations/ maintenance activities to handle General and A/B/C shift to meet deliverables. Contractor should have electrical contract license (class A) from Chhattisgarh Government and license holder technicians/supervisors for working in LT and HT electrical system up to 6.6KV.

Common Mobile and Phone Number has to be provided to operation for effective, Communication and daily reporting to EIC along with sufficient number of Walkie Talkies. Any damage to Balco assets including civil structure at CHP/AHP area due to contractor mishandling will be repaired by contractor himself within 15 days.

Any minor repair work in operator’s room, cabin, workshop, stores and storage yards is in contractor’s scope. Modification jobs (outsourced by owner) supervision shall be done by agency. All modification jobs are to be entered in to the master drawings and modified part drawing must be pasted on the respective panel. One set of manual and drawings to be handed over to the contractor.

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 oil. Monthly reconciliation status of spares, lubricants, motors, bearings, consumables to be provided to owner. Defective parts only be declared as scrap with the approval of owner.

Service provider has to follow all rules related to safety (industrial, personal, vehicle, road safety etc). Any instruction by BALCO EIC regarding safety is obligatory for service provider.

Painting for safety and 5S improvement and compliance, equipment protection (excluding structural painting) along with the supply of Paints and related tools will be in service provider’s scope.

Housekeeping of Entire AHP/CHP (Including buildings, all drains of AHP & ESP area and ash bulker weighbridge, conveyor area, bunker floor, track hopper, yard, unloading area, offices, etc on daily basis or as instructed by BALCO EIC).

New Fly Ash conveying and associated system under construction common for CPP -2 and 1200MW will be in the scope of service provider.

- **SAFETY/HIHE/5S**

  O&M Agency shall appoint full time qualified safety Officer (certified diploma or degree in industrial safety) who will ensure safety aspects in all activities of CHP/AHP. Any Violation in safety will lead to penalty.

**TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS**
Contractor to ensure Safety at workplace, obey safety rules, adopt Work permit system, proper check sheets, placing of danger board, men on work board. All contract employees shall identify and report any hazard/incident/accident and shall work on to eliminate all identified/possible hazards and incidents. Strictly follow proper tagging, LOTO system.

Contractor has to supply torch light in confined areas during working. Contractor has to improve and maintain the workplace for achieving good score in 5S. 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, 33KV), helmet, earplug, safety shoe, fuse Pullers, Torch light and insulated tools etc..
Compliance of all safety norms and audit points is in Contractors scope. Service Provider to follow Safety rules regarding Safety PPEs and their usage, Rope & Sling safety rules, Technological vehicle safety rules and other BALCO safety rules as applicable in CHP/AHP area. Service Provider to follow all guidelines of Welding, Gas handling inside plant as given by Safety Dept. of BALCO. All statutory requirements to be followed by contractor.

- **HOUSEKEEPING** –

Service Provider is to ensure 100 % cleaning of all areas of CHP/AHP starting from Track Hopper, BOBRN Compressor House, Ground Hopper, Conveyor Belts area, Crusher Building, Bunker Floor, Stacker & Reclaimers, Settling Ponds, Sampler area, CHP/AHP Office Building, Dozer maintenance Sheds and any other working area in CHP/AHP. All coal spilled in Conveyor Belts, Crusher Building, Bunker Area, and Stacker & Reclaimer bay, Take up area of all belts and all other working areas, is to be charged on daily basis, if the spilled coal is not cleaned within five days, the same will be lifted and charged by deputing some other agency by BALCO and cost of same will be debited to Service Provider’s bill.
Cleaning of Coal water settling pond and rain water settling pond is to be done by service provider as per the direction of EIC.

All Drains (surface water drain, storm water drain) and drain pits of CHP/AHP area are to be cleaned on monthly basis and in Rainy Season (July-October), drains are to be cleaned on weekly basis. Coal found in cleaning of drains is to be processed and charged or shifted to any place in CHP/AHP as per the direction of EIC. Coal recovered from Coal Settling pond and rainwater settling pond will also be processed and charged or shifted to any place in CHP/AHP as per the direction of EIC and other materials found from drains, Coal Settling pond and rainwater settling pond will be disposed to a location inside BALCO Plant as per the direction of EIC. ( Except High stock/ stocking of excess quantity in the yard )

All Panels of CHP/AHP area is to be cleaned by domestic Vacuum cleaner.
Service Provider to depute one full time Housekeeping Supervisor to ensure complete housekeeping in entire CHP/AHP area.
Charging of coal in belts coming out of Bulk Remover and Collection and shifting of stones coming out of Bulk remover to any place in CHP area as per direction of EIC is to be done by Service Provider.
Cleaning of all Sump Pits in entire CHP/AHP area on Monthly basis is to be done by Service Provider. And in rainy season Cleaning of all Sump Pits in entire CHP/AHP area on weekly basis is to be done by Service Provider. Shifting of All foreign material removed while cleaning of sump pits to any place inside CHP/AHP area as per direction of EIC is to be done by Service Provider.
Collection and Removal of tramp Iron coming through Magnetic Separator in CHP area ,iron pieces lying in conveyor gallery, transfer towers and shifting of same to any place inside plant as per direction of EIC is to be done by Service Provider.
Collection and Removal of all debris coming while cleaning of entire CHP/AHP area and
shifting of same to any place inside BALCO Plant as per direction of EIC is to be done by Service Provider.

**SCOPE OF VEHICLES FOR CHP/AHP round the clock Available.**

<table>
<thead>
<tr>
<th>No</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dozer</td>
</tr>
<tr>
<td>2</td>
<td>Hywa</td>
</tr>
<tr>
<td>3</td>
<td>Pocklain (2 more at the time of rainy season for about 4 months)</td>
</tr>
<tr>
<td>4</td>
<td>Loader (1 more at the time of rainy season for about 4 Months)</td>
</tr>
<tr>
<td>5</td>
<td>JCB</td>
</tr>
<tr>
<td>6</td>
<td>Bobcat</td>
</tr>
</tbody>
</table>

Contractor has to ensure round the clock availability of the equipment,

**Tools, Tackles & Consumables for AHP/CHP:**

The agency shall supply tools and tackles necessary for the Service as per attached Annexure -1. All tools and tackles including mobilization tools brought to the Project by agency shall be agency’s property and shall be taken away by the agency at the time of termination of the contract.

**LIST OF CONSUMABLES**

1. Kerosene, diesel, petrol and rust remover
2. CTC, Benzene etc.
3. Hacksaw blades.
5. Marking cloth and old cloth.
6. Asbestos cloth.
7. Prussian blue.
8. Lead wire (1.0 mm, 1.5 mm, 0.5 mm)
9. Liquid soap/soap powder.
10. Carborundum grinding paste (fine, medium and coarse)
11. Cut off wheels.
13. Sealing agents like M seal etc
14. Adhesive agents like locktite etc
15. Cleaning agents like WD-40, Terpentine oil etc
16. Oil stones.
17. Mounted wheels and rotary cutters.
18. Oxygen and D/A cylinders.
19. DP test kit and coir rope.
20. Chalks, marking pens, and thermal chalks up to 600°C
21. Insulation and medical tapes.
22. Polythene sheets.
23. Material for blast cleaning purposes.
24. Hand gloves (asbestos and rubber), manila rope.
26. Air blower (electric)
27 Electric drills of various sizes
28 Ball pen hammer of various sizes.
29 Electric switchboards and floor light arrangements.
30 Magnifying glasses.
31 Safety Helmets for labors.
32 Gas cutting and welding goggles.
33 Argon gas welding equipment.
34 Hand gloves Cotton & Leather.
35 Shims of various thickness
36 Sealant putty
37 Gland Ropes of different sizes
38 Oil/water/paper/rubber & metallic gaskets( Special high temp. spiral wound gasket is in the scope of BALCO)
39 Industrial paint (Yellow, Green, Black, Smoke grey, Red etc) , paint brush & thinner
40 LT bolts , Nuts and washers of sizes up to 36 mm
41 HT bolts , Nuts and washers of sizes up to 24 mm
42 Oil seals of all sizes
43 O-ring cords of all sizes
44 Silastic sealant
45 Anabond gasket sealant
46 Nitrogen cylinders
47 Fire suit
48 Steam suit
49 Graphite tape
50 Graphite powder
51 Thejo solution for belt joint
52 Holding liquid sealant
53 Jointing sheets
54 Insulation screw
55 Insulation Tape
56 Kerosene
57 Lead wire
58 Lugs( Aluminum)
59 PVC solution
60 Paintbrush
61 Pendent holder
62 Petrol, diesel
63 Petroleum jelly
64 Precision blue paste
65 Raval plugs
66 Rustolene
67 Sand paper
68 All kind of washers
69 Shellac
70 shims
71 sholdering paste
72 Sholdring rod
73 Spark lighter
74 Steam gasket sheets
75 Teflon tape
76 Twine
77 Varnish
78 Welding glasses german/white
79 Welding welders
80 Safety belts
81 Drill Bits
82 Emery sheet(Coarse & finr)
83 F.G tap varnished roll
84 Fevicol
85 Fevifold
86 Fibre glass sheet
87 Gouch screws
88 Grinding paste(coarse & Fine)
89 Holdite Graphite compound
90 Wood screws
91 Thejo hardner
92 Nipple grease gun

This list is only indicative and not exhaustive. Arrangement for any other consumables required for timely completion of the job shall be the responsibility of the Contractor

**LIST OF T&P**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Welding Generator with Regulator</td>
<td>Standard make</td>
</tr>
<tr>
<td>2</td>
<td>Welding Transformer</td>
<td>Standard make</td>
</tr>
<tr>
<td>3</td>
<td>Chain Pulley Blocks</td>
<td>10T</td>
</tr>
<tr>
<td>4</td>
<td>Chain Pulley Blocks</td>
<td>5T</td>
</tr>
<tr>
<td>5</td>
<td>Chain Pulley Blocks</td>
<td>3T</td>
</tr>
<tr>
<td>6</td>
<td>Chain Pulley Blocks</td>
<td>2T</td>
</tr>
<tr>
<td>7</td>
<td>Chain Pulley Blocks</td>
<td>1T</td>
</tr>
<tr>
<td>8</td>
<td>Pulling Lifting M/c</td>
<td>3T</td>
</tr>
<tr>
<td>9</td>
<td>Pulling Lifting M/c</td>
<td>1.5T</td>
</tr>
<tr>
<td>10</td>
<td>D/E Open Spanners</td>
<td>Up to 75</td>
</tr>
<tr>
<td>11</td>
<td>D/E Ring Spanners</td>
<td>Up to 75</td>
</tr>
<tr>
<td>12</td>
<td>S/E Long handle Open Spanners</td>
<td>50, 55, 60, 65, 70, 75</td>
</tr>
<tr>
<td>13</td>
<td>Star Hammering Spanners</td>
<td>24, 30, 32, 36, 41, 46, 50, 55, 60, 65, 70, 75</td>
</tr>
<tr>
<td>14</td>
<td>Box Spanner</td>
<td>Up to 75</td>
</tr>
<tr>
<td>15</td>
<td>T - Handle for above</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Tubular Spanner</td>
<td>6 x 7 to 30 x 32</td>
</tr>
<tr>
<td>17</td>
<td>Adjustable Spanner</td>
<td>12&quot;, 6&quot;</td>
</tr>
<tr>
<td>18</td>
<td>Pipe Wrench</td>
<td>24&quot;, 18&quot;, 12&quot;, 6&quot;</td>
</tr>
<tr>
<td>19</td>
<td>Screw Driver</td>
<td>18&quot;, 12&quot;</td>
</tr>
<tr>
<td>No.</td>
<td>Item Description</td>
<td>Specifications</td>
</tr>
<tr>
<td>-----</td>
<td>---------------------------------------------</td>
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</tr>
<tr>
<td>20</td>
<td>Torque Wrench</td>
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</tr>
<tr>
<td>21</td>
<td>Combination Pliers</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Outside Circlip Pliers</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Inside Circlip Pliers</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Nose Pliers</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Hydraulic jack with pump</td>
<td>100T</td>
</tr>
<tr>
<td>26</td>
<td>Hydraulic jack with pump</td>
<td>50T</td>
</tr>
<tr>
<td>27</td>
<td>Button Hydraulic Jack Pump</td>
<td>20T, 50T</td>
</tr>
<tr>
<td>28</td>
<td>Crow Bar</td>
<td>1&quot;</td>
</tr>
<tr>
<td>29</td>
<td>Temperature Gun</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Bending Machine</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Motorized Chain Block</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Sledge Hammer</td>
<td>20lbs, 10lbs, 4lbs</td>
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<tr>
<td>33</td>
<td>BP Hammer</td>
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<tr>
<td>34</td>
<td>Outside Micrometer</td>
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<tr>
<td>36</td>
<td>Outside Micrometer</td>
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<td>37</td>
<td>Outside Micrometer</td>
<td>300 - 400</td>
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<td>38</td>
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<tr>
<td>39</td>
<td>Inside Micrometer</td>
<td>50 - 1000</td>
</tr>
<tr>
<td>40</td>
<td>Vernier Caliper</td>
<td>12&quot;</td>
</tr>
<tr>
<td>41</td>
<td>Vernier Caliper</td>
<td>6&quot;</td>
</tr>
<tr>
<td>42</td>
<td>Dial Gauge with Magnetic Stand</td>
<td></td>
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<tr>
<td>43</td>
<td>Allan Key</td>
<td>14, 16, 20, 24</td>
</tr>
<tr>
<td>44</td>
<td>Allan Key</td>
<td>14, 16, 20, 24</td>
</tr>
<tr>
<td>45</td>
<td>Gas Cutting Set</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Argon Set</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>Welding Cable</td>
<td>400 amps</td>
</tr>
<tr>
<td>48</td>
<td>Master Level</td>
<td>4&quot;</td>
</tr>
<tr>
<td>49</td>
<td>Spirit Level</td>
<td>8&quot;</td>
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<tr>
<td>50</td>
<td>Plum bob</td>
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<tr>
<td>51</td>
<td>Shim Cutter</td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>Angle Grinder</td>
<td>AG - 7</td>
</tr>
<tr>
<td>53</td>
<td>Angle Grinder</td>
<td>AG - 5</td>
</tr>
<tr>
<td>54</td>
<td>Angle Grinder</td>
<td>AG - 4</td>
</tr>
<tr>
<td>55</td>
<td>Straight Grinder</td>
<td>GQ - 4</td>
</tr>
<tr>
<td>56</td>
<td>Flexible Shaft Grinder</td>
<td>FF - 2</td>
</tr>
<tr>
<td>57</td>
<td>High Speed Grinder</td>
<td>HSG</td>
</tr>
<tr>
<td>58</td>
<td>Portable Drilling M/c</td>
<td>up to 12 mm</td>
</tr>
<tr>
<td>59</td>
<td>Hole Punch</td>
<td>Assorted Size</td>
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<tr>
<td>60</td>
<td>Drill Bit</td>
<td>Assorted Size</td>
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<tr>
<td>61</td>
<td>Wire Rope Slings</td>
<td>Assorted Size</td>
</tr>
<tr>
<td>62</td>
<td>Eye Bolt</td>
<td>Assorted Size</td>
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<tr>
<td>63</td>
<td>Wooden Sleepers</td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>Scaffolding Pipes</td>
<td>6 mtrs length</td>
</tr>
<tr>
<td>65</td>
<td>Scaffolding Pipes</td>
<td>3 mtrs length</td>
</tr>
<tr>
<td>66</td>
<td>Scaffolding Clamps (Fixed type)</td>
<td></td>
</tr>
<tr>
<td>67</td>
<td>Scaffolding Clamps (Swivel Type)</td>
<td></td>
</tr>
<tr>
<td>68</td>
<td>Scaffolding Planks (Metallic)</td>
<td></td>
</tr>
<tr>
<td>69</td>
<td>Bearing Puller</td>
<td></td>
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<tr>
<td>70</td>
<td>Measuring Tape</td>
<td></td>
</tr>
<tr>
<td>71</td>
<td>Torch</td>
<td></td>
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</tbody>
</table>

**TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS**
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>72</td>
<td>Bearing Heaters</td>
</tr>
<tr>
<td>73</td>
<td>Chop saw Machine</td>
</tr>
<tr>
<td>74</td>
<td>Magnetic drill machine</td>
</tr>
<tr>
<td>75</td>
<td>Hand drill machine</td>
</tr>
<tr>
<td>76</td>
<td>Thread die (mm)</td>
</tr>
<tr>
<td>77</td>
<td>Thread die (Inches)</td>
</tr>
<tr>
<td>78</td>
<td>Valve-seat lapping machine, portable lapping machine (Motorized or pneumatic)</td>
</tr>
<tr>
<td>79</td>
<td>Torque wrench (Motorized or hydraulic)</td>
</tr>
<tr>
<td>80</td>
<td>Bench vise</td>
</tr>
<tr>
<td>81</td>
<td>Angle finder</td>
</tr>
<tr>
<td>82</td>
<td>Needle dial gauge</td>
</tr>
<tr>
<td>83</td>
<td>Pedestal Fan with chicken mesh covering and extension cable with plug / socket</td>
</tr>
<tr>
<td>84</td>
<td>DC lamps</td>
</tr>
<tr>
<td>85</td>
<td>AC to DC converter (Portable transformer kit)</td>
</tr>
<tr>
<td>86</td>
<td>Laser alignment kit</td>
</tr>
<tr>
<td>87</td>
<td>Bearing / Coupling Puller</td>
</tr>
<tr>
<td>88</td>
<td>Nitrogen filling kit for accumulators</td>
</tr>
<tr>
<td>89</td>
<td>Portable exhaust fan with accessories</td>
</tr>
<tr>
<td>90</td>
<td>Slide wrench</td>
</tr>
<tr>
<td>91</td>
<td>Tripod stand for working in confines space</td>
</tr>
<tr>
<td>92</td>
<td>Public announcement system / kit</td>
</tr>
<tr>
<td>93</td>
<td>White boards</td>
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<tr>
<td>94</td>
<td>Display / Notice boards</td>
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<tr>
<td>95</td>
<td>Vacuum cleaner</td>
</tr>
<tr>
<td>96</td>
<td>Dewatering pump with accessories</td>
</tr>
<tr>
<td>97</td>
<td>Safety net for work at height</td>
</tr>
<tr>
<td>98</td>
<td>Safety belts (Double hooking)</td>
</tr>
<tr>
<td>99</td>
<td>Rescue kit for work at height</td>
</tr>
<tr>
<td>100</td>
<td>Portable welding machine with accessories</td>
</tr>
</tbody>
</table>

This list is only indicative and not exhaustive. Arrangement for any other T & P required for timely completion of the job shall be the responsibility of the Contractor.
SCOPE OF WORK TPP 1200 MW
SCOPE OF WORK FOR MECHANICAL MAINTENANCE – 4x300 MW

Areas to be covered under Service Provider’s scope:
The entire power plant area as follows:
1. Boilers and Auxiliaries
2. Steam Turbine and Auxiliaries - 04
3. Balance of Plant (Raw Water treatment plant, DM plant, Cooling Towers, CW system, Air Compressors and air handling units, Fuel oil unloading/loading, Transfer and handling system, Hydrogen generation system, Service and firefighting system, fire alarm system, return water system, Chiller system, Dosing system, Diesel Generators)

Equipment list for all the areas is attached for reference.

SCOPE OF WORK FOR BOILER

- Visual Inspection & correction of hanger support.
- Scaffolding & small platform, temporary platforms in Service Provider scope for any repair & rectification work.
- Oil gun assembly Repair / replacement. Oil valves repair and replacement.
- SADC damper repairing.
- Wall soot blower, APH Soot blower, Semi & long retractable soot blower Problem rectification / replacement
- Soot blower Pressure Adjustment.
- Rope / gasket replacement of doors/gates/dampers.
- Repair of Insulation & sheeting work.
- Online Sealing of Steam & Water Leakage in tube, pipe & valves will be arranged by the Service Providers.
- Repair and replacement of HP and LP valves as per requirement.
- Small modifications are in the scope of Service Providers and the material for the same will be supplied by BALCO.
- Painting of boiler structure, Fans, ducts, pipe lines for 5S activities, paint will be given by BALCO.
- Inspection of Hydraulic test for Boiler Pressure Parts and inspection of drum internals and Gauge glass repair will be in the scope of Service Provider.
- Tube/ Pipe bending as per the requirement will be in the scope of Service Provider.
- Scaffolding required any will be in service providers scope.
- Preventive Maintenance and Daily Checklist filling of Boiler area Equipments as per given list and Instruction of EIC
- Safety valve pressure setting and travy test will be in service providers scope.
- Burner tilt and Burner Adjustment system
• Inspection and Maintenance of All electrical hoists and Boiler Elevators.
• Inspection and repair of bottom seal truff area and fixing of refractory where ever required.
• Bottom ash chain conveyor top hydraulic gates inspection, repair and replacement as per preventive maintenance list.
• Bottom Ash Chain Conveyor maintenance – inspection repair and replacement of components as per requirement.

SCOPE OF WORK FOR COAL MILLS

A) Routine Maintenance Activities of Mill

2. Replacement/top up of lube/Hydraulic Oil/Roller Oil as per requirement.
3. Cleaning of Hydraulic Oil tanks.
4. Hydraulic or Lube oil station all equipment repair/replacement to be done.
5. Open the mill manhole door for inspection & adjustment of Shims of loading frame for gap setting between roller & Liner
6. Inspection of the tightness of the stuffing box bolts, classifier flange bolts & flange of coal discharge pipes
7. Replacement of Stuffing box rope.
8. Inspection of the hydraulic pipeline & support properly. If needed rectification/Clamping to be done.
9. Routine Maintenance of all the MDVs. Patch welding of leakages form coal pipes and mill body and other areas.
10. Repair/Replacement of tie rod.
11. Replacement of bottom carbon seal/rope is in the scope of Service Provider.
12. Inspection of the loading cylinders for any leakage. If needed rectification to be done.
13. Repair of the Mill reject gate (Pneumatic/Hydraulic as well as manual doors).
14. Cleaning of the coal from Primary air duct. Inspection of the duct for any leakage points if needed welding to be done on leakage points.
15. Inspection/Repair/Replacement of the scrappers Assembly.
16. Routine Maintenance of the cold air gate & dampers & its actuators removal and installation. Grease the bearings and If needed rectification/ replacement to be done.
17. Routine Maintenance of the Hot air gate & dampers & its actuators removal and installation. Grease the bearings and If needed rectification/ replacement to be done.
18. Cleaning the coal from inside of the mill & Check the clearance between the roller and Liner and it should be maintained as per instruction of EIC.
19. Tracking of wear rate of crushing elements and thereby planning mill overhauling is in Service Provider’s scope.
20. Checking of the tightness of all the bolts inside the mill (like loading frame, roller studs etc).
21. Inspection/Repair/Setting the classifier vane angle as per instruction of EIC.
22. Check the movements of the rollers, i.e. check the roller bearings.
23. Inspection/Replacement of Roller seal air assembly
24. Checking of all type of valves (oil/inert steam/water/Seal air) associated to mill and if needed rectification/replacement to be done.
25. Online leakage arresting & patch welding of mill discharge & center pipe is in Service Provider’s scope.
27. Repair/Replacement of centre pipe & mill inlet gate is in the scope of Service Provider.
28. Any kind of hard facing job is in the scope of Service Provider and the special electrodes will be supplied by BALCO.
29. Any kind of temporary arrangement for Mill isolation is in Service Provider’s scope.
30. Any small modification is the scope of Service Provider for clearing coal choking from the mill.
31. Painting of Mill/pipeline/duct/wall for 5S activities.
32. Repair/Replacement maintenance of hoist.
33. Replacement of Loading Cylinder or its base plate.
34. Replacement of MDV.
35. Replacement of bearings of roller assembly.
36. Repair of Hot Air Damper / Cold air Damper.
37. Repair of all gearboxes in Mill area.
38. Attending leakages of coal/air/oil/water by online method in service provider’s scope.
39. Removal and Fixing of insulation as per requirement.
40. Preventive Maintenance and filling of check list for all equipment of Coal mill area as per given list.
41. Auxiliary Steam system and SCAPH system.

**Mill reject system:-**
- Monthly Preventive maintenance of the system.
- Cleaning & chocking clearing of the system.
- Any line replacement & valve replacement will be under vendor scope.
- Vessel cleaning & repair will under vendor scope.
- HP LP Pump maintenance will under vendor scope.
- Dewatering bin maintenance will be under vendor’s scope.

**MAINTENANCE OF PORTABLE CENTRIFUGE**
- Carry out external cleaning of equipment.
- Check all joints for leakages if any arrest it.
- Attend all leakages.
- Cleaning of bowls to be done.
- If required replacement of Gear box oil.
- Arresting leakage from view glass & servicing the same.
- Complete servicing of Centrifuge that includes servicing of oil pump, booster pump, main pump, three way valve, and replacement of worm gear.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.
Scope of work for Coal feeders

A) Routine maintenance of coal feeder

1. Daily cleaning of feeder body externally.
2. Inspection, Adjustment, Repair, Replacement of Coal Feeder Belt as per requirement.
3. Inspection & Clearing of any foreign materials stuck up between body and belts.
4. Running the feeder and carry out alignment if necessary.
5. Checking / maintaining oil level of gearbox (Belt Drive & Scraper Chain).
7. Checking / adjustment of chain tension.
9. Patch welding feeder & feeder inlet pipe
10. Spill over oil / water / cotton waste / debris etc in surrounding area and floor to be cleaned up to satisfaction of EIC.
11. Repair/ replacement/ Maintenance of air cannon.
12. Opening of feeder doors for calibration.
13. Opening of gearbox for inspection & servicing including replacement of bearing & oil seals. Replacement of gearbox if required.
15. Replacement of bearings and seals of take-up pulley.
16. Servicing/ Replacement of Chain Scraper
17. Feeder discharge pipe, Chute, Expansion Bellow repair and replacement as per requirement.
18. Cleaning of Choked raw coal feeder and checking of feeder internals:
   1. Opening of feeder doors after isolation.
   2. Removal of accumulated coal dust / coal manually outside.
   3. Emptying of feeder area.
   4. Complete checking of feeder internals for any apparent damage and submission of report to Engineer-in-charge.
   5. Box up and trail run of feeder.
19. Feeder door opening and closing for Belt calibration.
20. Clearing of choking of coal bunkers

SCOPE OF WORK FOR ESP

1. INTERNAL CLEANING OF ESP:
   a. Ensure the PTW.
   b. Open the hatches door.
   c. Empty the accumulated ash and remove any residual buildup of ash on internal parts from ESP hopper.
   d. Cleaning of internal with water jet/air.

2. SERVICING OF RAPPING MECHANISM OF ESP:
   a. Check the rapper rod connection (anvils) for loose, broken and bent connections.

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
b. Inspection / Replacement of bearings.
c. Inspection / Replacement of shaft.
d. Inspection / Replacement of fastener during assembly.
e. Inspection / Replacement of tumbling hammer assembly.

3. **SERVICING OF COLLECTING ELECTRODE SYSTEM:**
   a. Check the alignment of collecting electrodes, shock bars and guides.
   b. Inspection / Replacement of shock bars / shock pad.
   c. Rectification / replacement of collecting electrodes.

4. **SERVICING OF EMITTING ELECTRODE SYSTEM:**
   a. Inspection / Replacement of emitting electrodes.
   b. Inspection / Cleaning of support insulator and housing for excessive build-up of ash.
   c. Inspection / Cleaning of shaft insulator.
   d. Replacement of cracked shaft & support insulator.
   e. Inspection / Servicing / Replacement of pin wheel & its mechanism.
   f. Epoxy coating of support insulator housing.

5. **ATTENDING WELDING LEAKAGE FROM HOPPER AND ESP:**
   a. Preparation of scaffolding.
   b. Remove the insulation from the leaky area.
   c. Arresting the leakage by welding the leakage area.
   d. Re-fix the insulation after arresting the leakage.
   e. Removing scaffolding and scraps after completion of job

6. **SERVICING OF FABRIC FILTER HOUSE:**
   a. Inspection for filter bag & cage condition.
   b. Replacement of filter bags as per requirement.
   d. Leakage arresting of fabric filter hopper.
   e. Damper correction & replacement.
   f. Pneumatic cylinder replacement & correction work.
   g. Seal air fan maintenance.
   h. Hoist maintenance.

7. Inspection of all ESP fields during short shutdown
8. Replacement of insulators
9. Replacement of emitting electrodes

**Scope of work for ID / FD / PA / Seal Air / Scanner Air FANS & APH:**

A) **Routine Maintenance**

1. Cleaning of equipments.
2. Replacement of lubricants/top up of oil and cleaning of filters.
3. Repair/Replacement of cooling water line and oil line.
4. Routine Maintenance of Dampers/IGV’s & Gates.
5. Removal & Installation of actuators.
6. PM of fans including alignment check and minor repair of insulation
7. Preventive Maintenance of Hoist
8. Preventive Maintenance of Hydraulic/Lube oil Station including repair/replacement of pump and motor.
10. Preventive Maintenance of oil cooler/filter cleaning, oil leakage arresting if any
11. Bearing replacement of all the Fans as per requirement.
12. Inspection of bearing.
13. Arrangement for Balancing (Opening Manhole door, inspection of blades, welding of balancing weights & box up after rectification) will be in the Service Provider’s scope.
15. Repair/Replacement of expansion bellow
16. Replacement of Blade Pitch Control Assembly if required
17. Bearing inspection & replacement if required
18. Preventive Maintenance and daily checklist filling of all fans as per given list.
19. Alignment and Balancing of fans as per requirement and instructions of EIC.

**MOTORS**
Coupling, fixing, alignment of the motor with drive equipments is with the service providers scope. Providing hydra operator round the clock for shifting heavy motors will be in service provider’s scope.

**Scope of work for APH**
1. Check the oil level in support & guide bearing sump. If found low, top up and maintaining logbook of oil top up.
2. Daily cleaning of gearbox and surrounding area by air and cotton waste.
3. Daily check for any abnormalities of main reducing gearbox during running condition.
4. Check the oil level in main drive gearbox. If found low, top up and maintaining logbook of oil top up.
5. Patching of inlet and outlet ducts and body of APH as per requirement.
6. Repair and replacement of inlet and outlet dampers as per requirement.
7. Fixing and removal of Insulation as per requirement.
8. Check the Air filter oil drain plug, if loose tight it up. If oil level is low, top up
9. Repair/replacement of Air Motor
10. Inspect sector plate bolts for looseness & breakage from outside
11. Main reducer gear box bearing greasing as and when required
12. Carry out external cleaning of soot blower gearbox.
13. Check the oil level in soot blower gearbox. If low, top up, checking of coupling spider, checking of foundation bolt tightness and take corrective action if required. Check for oil leakage. If found, arrest it.
15. APH Soot blower Problem rectification / replacement
16. Repair/Replacement of expansion bellow
17. Repair replacement of APH seals as per requirement.
18. Repair/Replacement of Clutch Coupling
19. Gear box inspection.
20. Partial seals setting and replacement.
22. Motor Alignment

**Duct:**
1. Duct repairing, duct plate replacement.
2. Duct supports repairing/replacement.
3. Expansion bellow repairing/replacement.
4. Insulation removal and replacement.

**Scope of work for soot blowers**

**A) Routine Maintenance**-

- Clean the equipment thoroughly.
- Check the gasket condition at the flange position & replace if required.
- Check the gland packing condition & replace if required.
- Check for smooth rotation of the guide bar support roller bearing & lubrication.
- Check the oil level in gear box & top up if required.
- Check and lubricate the poppet valve.
- Check and lubricate the main bearing.
- Clean and lubricate the rack gear.
- Servicing of lance tube.
- Dismantle lance tube and flange coupling.
- Clean and check its straightness and rectify if minor bend is there, otherwise takeout bend lance tube after providing scaffolding inside furnace if required.
- Fit new or repaired lance tube.
- Fix flange coupling.
- Servicing of Poppet valve
- Remove Poppet valve by dismantling inlet and outlet
- Take out spindle and disc.
- Check spindle and disc, if ok then assemble it after proper lapping.
- Replace spindles and disc if required.
- Assemble Poppet valve completely.
- Fit Poppet valve to its position with new gasket.
- Check for any leakage & attend.
- Servicing Gear Train Arrangement:
- Drain out oil of the gear box.
- Remove gear box and dismantle.
- Clean all components thoroughly.
- Replace damaged components and gears if required.
- Assemble all components and fit gear box at its position.
- Clean rack & pinion assembly and lubricate properly.
- Dismantle guide ring box.
• Takeout guide ring, check it, repair/replace if required.
• Assemble guide ring box and fit it to its position.
• Fill oil in gear box.
• Repair/replacement of soot blower guide stand
• Takeout old guide stands, repair/replace if required.
• Fit guide stand to its correct position with sufficient support.
• Pressure setting and checking of soot blower
• After completion of the work, pressure setting and checking to be done.
• Remove plug and air connection.
• Fit pressure gauge with adopter.
• Check pressure setting and adjust it to the correct one if required.
• Remove pressure gauge with adopter.
• Fit plug and air connection.
• Pressure settings & Trial
• Preventive Maintenance and filling of PM check list of all soot blowers as per given list.

Scope of work for VALVES / NRV’S
1. Attending gland leakages either by tightening or by replacing the glands.
3. Greasing of valves of all sizes as per requirement.
4. Safety valve pressure setting as per the requirement. Travey test to be done by service provider
5. Attending flange / Bonnet leakages either by tightening or by replacing the gasket / seal ring.
6. Hot tightening of flange or bonnets.
8. Repair of Valves as per requirement.
9. Replacement of valves as per instruction of EIC.
10. Attending the problem valve mechanical jamming.
11. Welding of handles / putting new handles to the valve.
12. Repair and revival of damaged valves/ parts of valves such as discs, spindles, bonnets etc.
13. Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.
15. Cleaning and replacement of strainers.

PREVENTIVE & ROUTINE MAINTENANCE OF EQUIPEMENTS OF TG & AUXILLIARIES

MAINTENANCE OF LUBE / GOVERNING OIL SYSTEM
• Checking of any leakage from MOT, if possible attend it.
• Attending any leakage from valves.
• Arresting any leakage from AOP, JOP or EOP.
• Replacement of AC/DC LOP/JOP/EOP/EOCP and eh oil pumps as per required.

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
• Repairing or servicing of EH system main pump and recirculation pump
• Oil top up in MOT, as and when required.
• Removing of all waste oil drums and shifting to central stores, either empty or filled from
  MOT or any other area inside the Turbine house.
• Removal & re-fixing of gratings for assisting housekeeping personnel for cleaning of MOT.
• Cleaning of heat exchangers, tanks and tank internals
• Checking, repair and replacement of accumulators and its parts.
• Replacement of filters in the EH oil system
• Servicing of Test valves/3 way valves/Emergency shut-off valves/Temp. Control valves/Fire
  protection valves.
• Cleaning of Duplex Strainer / basket strainers & Control oil line filters.
• Providing assistance for taking of oil sample from MOT, Centrifuge & BFP as and when
  required.
• Cleaning of all pipe line of the lube oil and EH oil
• Replacement of fitting, o rings in eh oil lines
• Servicing the hydraulic block of both EH oil system, Lube oil systems and associated blocks
  of turbine steam valves actuator.
• Servicing the turbine over speed tripping and latching device, only if any problem occurred.
• Repair and replacement of hydraulic blocks of EH oil system
• Attending gland leakage of all Valves inside the MOT.
• Attending flange leakage of all flanges inside the MOT.
• Replacement of oil, pump glands, bearings and couplings of Dirty oil, Drain oil, Clean oil &
  Leakage oil Pumps.
• Maintenance of JOP pumps ,blocks, filters and PRVs.
• Replacement of bearings, gland packing and coupling of oil vapour extraction fan.
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned
  up to the satisfaction of EIC.

MAINTENANCE OF LUBE OIL SYSTEM DIRTY / CLEAN OIL TANK, ITS VALVES, LINES AND PUMPS.

• Carry out external cleaning of equipment.
• Check all joints for leakages if any arrest it.
• Cleaning of all pipe lines
• Cleaning of COT and DOT of lube oil system
• Check all holding down bolts for tightness and take corrective action if required
• Check gland leakages if leakage is to be observed, same to be attended either by replacing
  the glands or by tightening it.
• Check coupling spider for damage, if necessary replace it.
• Attend all leakages.
• Checking of alignment of Pump with Motor and do the necessary correction if required.
• Inspection / Replacement of bearings of Clean / Dirty / Leakage Oil Pumps.
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE OF DEARETOR AND CONDENSER

• Carry out external and internal cleaning of condenser and deaerator.
• Check all leakage and arrest if found.
• Cleaning and inspection of all associated pipe lines
• Cleaning of spray nozzles, perforated pipes present inside the deaerator and condenser
• Check all holding down bolts for tightness and take corrective action if required
• Check gland leakages if leakage is to be observed, same to be attended either by replacing the glands or by tightening it.
• Check the condition of the baffles and supports and repair it if required
• Check the condition of the condenser bellow and replace if required.
• Fix the temporary support on the condenser and remove it when ever required
• Cleaning of condenser tubes when ever required
• Inspection and cleaning of water box when ever required.
• Replacement and repair of rupture disc.
• Identified the damaged tubes in the condenser and plug the same if required.
• Replacement of anode in water box
• Removal and Fixing of insulation in the deaerator when ever required
• Check the air ingress point on the condenser with the help of advanced systems like helium leak detection or florescent method or any other advance methods and arrest the ingress point.
• Provide the assistance during the flood test of condenser

MAINTENANCE OF HP and LP HEATERS

• Carry out external and internal cleaning heaters.
• Check all leakage and arrest if found.
• Cleaning and inspection of all associated pipe lines
• Cleaning of heater tubes whenever required
• Check all holding down bolts for tightness and take corrective action if required
• Check gland leakages if leakage is to be observed, same to be attended either by replacing the glands or by tightening it.
• Inspection and replacement of water box separation flange gasket and replace if required.
• Removal and refit of heater tube bank when ever required
• Inspection and setting of safety valve and maintenance associated pipe lines.
• Inspection and cleaning of water box when ever required.
• Identified the damaged tubes in the heater and plug the same if required

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
• Provide the assistance during the flood test.
• Carried out hydro test of the heater when ever required.

PREVENTIVE MAINTENANCE ON OIL VAPOUR EXTRACTION (ON MOT VAPOUR EXTRACTION FANS)

• Carry out external cleaning of equipment.
• Check all joints for leakages if any arrest it.
• Check all holding down bolts for tightness and take corrective action if required
• Check gland leakages if any arrest it if leakage is to be observed, same to be attended either by replacing the glands or by tightening it.
• Attend all leakages
• Replacement of Impeller.
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE OF CENTRIFUGE / PORTABLE OIL PURIFIER

• Carry out external cleaning of equipment.
• Check all joints for leakages if any arrest it.
• Attend all leakages.
• Cleaning of bowls to be done.
• If required replacement of Gear box oil.
• Arresting leakage from view glass & servicing the same.
• Complete servicing of Centrifuge/Oil purifier that includes servicing of oil pump, booster pump, main pump, three way valve, and replacement of worm gear.
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE OF SEAL OIL & HYDROGEN GAS SYSTEM
• Cleaning and replacement of seal oil Duplex filters on need basis or during short shutdown.
• Attending any oil leakages in seal oil unit.
• Cleaning of seal oil tank when required
• Setting and inspection of the seal oil tank float valve and spray nozzles and replace if required
• Replacement and repair of all associated valves of seal oil system when required
• Checking Hydrogen leakage from Generator to gas filling station (Plant) and attending the same.
• Inspection ,cleaning ,repair and replacement of Differential pressure regulator and pressure relief valve when required
• Inspection and cleaning of float trap, enlargement tank and air detraining tank of seal oil system
• Replacement ,repair or cleaning of hydrogen gas cooler seals and hydrogen gas valves

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
- Replacement of molecular sieves /silica gel in Hydrogen dryer and blowers.
- Filling of hydrogen/CO2/N2/refrigerant gas in the respective equipment/container and monitoring the level/pressure of the same.
- Inspection, repair and replacement of all valves in the Hydrogen lines.
- Preventive maintenance of hydrogen Blower and drier.
- Transportation & Shifting of Full / empty Hydrogen / CO2 / N2 cylinder.
- Routine maintenance of Dryer / Blower
- Cleaning of generator hydrogen cooler.
- Replacement of generator hydrogen cooler whenever required.
- Hydro test of generator hydrogen cooler.
- Routine maintenance of H2 & CO2 filling station valves / pressure regulators etc
- Maintenance of CO2 Vaporizer.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned upto the satisfaction of EIC.
- Filling of oil in MOT tank and maintaining its oil level by monitoring and oil top up if and when required.

MAINTENANCE OF AC / DC SEAL OIL PUMP and SEAL OIL RECIRCULATION PUMP

- Carry out external cleaning of equipment.
- Check all joints for leakages if any arrest it.
- Check all holding down bolts for tightness and take corrective action if required.
- Check mechanical seal/oil seal leakages, if found replace the same.
- Check coupling spider for damage, if necessary replace it.
- Attend all leakages and maintenance of seal oil vapor exhaust fan.
- Checking of alignment of Pump with Motor and do the necessary correction if required.
- Routine maintenance of AC / DC Seal oil Pumps/Replacement of bearings of Seal oil Pumps.
- Replacement of motors and pump of seal oil pumps if required .
- Attending leakages of mechanical seals by replacement as and when reported.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE OF GENERATOR SEAL OIL VACCUM PUMP

- Carry out external cleaning of equipment.
- Check all joints for leakages if any arrest it.
- Check all holding down bolts for tightness and take corrective action if required.
- Check gland leakages if any arrest it.
- Check coupling spider for damage, if necessary replace it.
- Check the oil level, if level is low top-up.
- Attend all leakages.
- Preventive maintenance of Seal oil Vacuum Pumps/Replacement of bearings of Seal oil Vacuum Pumps.
- Replacement of motors or seal oil pump if required .

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE ON HP (Phosphate dosing pump) / LP (Hydrazine / Ammonia) DOZING PUMPS AND NaOH DOSING SYSTEM

• Carry out external cleaning of equipment.
• Check all joints for leakages if any arrest it.
• Check all holding down bolts for tightness and take corrective action if required.
• Check gland leakages if any arrest it if leakage is to be observed, same to be attended either by replacing the glands or by tightening it.
• Check coupling spider for damage, if necessary replace it.
• Check the tightness of coupling bolts.
• Attend all leakages either by welding or replacement of gland/gaskets.
• Installation of new HP / AMMONIA / HYDRAZINE dosing pumps and servicing of removed / old HP / AMMONIA / HYDRAZINE dosing pumps and keeping it ready for future use.
• Routine Maintenance of mixing tank agitators & greasing of agitator shaft coupling.
• Routine Maintenance of NaOH dosing system & greasing of agitator shaft coupling.
• Replacement of bearings, Gland packings, Internal of pumps / Agitator, etc.
• Check for any leakage in NaOH dosing system, if leakage is to be observed, same to be attended.
• Minor modification of NaOH dozing system.
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE OF LP BYPASS SYSTEM

• Carry out external cleaning of equipment.
• Check all joints for leakages if any arrest it.
• Check all holding down bolts for tightness and take corrective action if required.
• Check for air leakages if any arrest it.
• Gland leakage to be arrested if any either by tightening or by replacing packings.
• Actuator/valve bush to be replaced if necessary.
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.
• LP BP Steam CV servicing.
• LP BP spray CV and block servicing.

MAINTENANCE OF HP BYPASS SYSTEM

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
- Carry out external cleaning of equipment.
- Check all joints for leakages if any arrest it.
- Check all holding down bolts for tightness and take corrective action if required.
- Check for any air leakages if any and arrest it as and when required.
- Gland leakage to be arrested if any either by tightening or by replacing packings.
- Actuator/valve bush to be replaced if necessary.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned upto the satisfaction of EIC.
- HP BP Steam CV servicing.
- HP/LP BP spray CV servicing.

MAINTENANCE OF MDBFP, TDBFP, BOOSTER, HYDRAULIC COUPLING

- Carry out external cleaning of equipment.
- Replacement of BFP cartridge
- Repair the damaged Boiler feed pump cartridge ,BFP cartridge shell.
- Replacement and repair all type of damaged parts in the BFP cartridge and its assembly.
- Check all holding down bolts for tightness and take corrective action if required.
- Check lube oil level, if low top-up with Turbinol-32.
- Cleaning of suction strainer of BFP and Booster pump.
- Removal, replacement, repositioning and alignments of Booster pump and MDBFP motors whenever required.
- Check for oil leakages if any arrest it either by welding/replacement of gland/gaskets.
- Check for mechanical seal leakage, if it is beyond permissible limit, take equipment isolation and attend the leakage.
- Attending leakage of Booster Pump Mechanical seals either by complete replacement of mechanical seal or by replacing the defective part.
- Inspection / Replacement / Servicing of Booster Pump DE/NDE bearings and thrust pads.
- Inspection / Servicing of Lub Oil Pump.
- Inspection and N2 filling in Accumulator
- Replacement of bladder in accumulator.
- Clean and replacement of lube oil filter and valves in oil system.
- Clean the magnetic filters.
- Check for lubricating oil is flowing freely through the boosters pump DE and NDE bearing drain flow.
- Check for lubricating oil is flowing freely through the BP side and HC side driven motor bearing drain flow.
- Check for lubricating oil is flowing freely through the feed pump/Motor/Booster Pump DE and NDE bearing drain flow.
- Check that the cooling water from the booster pump mechanical seals is flowing freely through the flow indicators
- Check for joints and valve glands for leakages, if any arrest it either by tightening or by replacing the glands.
- Attend all oil & water leakages
- Removal of coupling guards of all BFP to hydraulic coupling, Hydraulic coupling to Motor and Motor to Booster Pump and tightness checking of coupling bolts.
- Checking of alignment of BFP to Hydraulic coupling, Hydraulic coupling to Motor and Motor to Booster Pump and do the necessary correction if required.
- Cleaning of BFP & Booster pump suction strainer against routine defects and replacement of its drain valve
- Top up of oil in BFP Hydraulic coupling as and when required.
- Inspection and cleaning of TDBFP lube oil tanks
- Transferring, purifying and restoring of oil in the TDBFP oil tanks.
- Replacement of Hydraulic Coupling fusible plugs.
- Inspection / Replacement of Hydraulic Coupling journal bearings and BFP main pump.
- Cleaning of Duplex filters.
- Cleaning of Mechanical seal coolers of BFP.
- Cleaning of lube oil coolers / working oil coolers.
- Centrifuging of Hydraulic coupling oil as and when required.
- Attending of flange leakage and all union leakages.
- Attending any impulse line leakage either by welding or by tightening.
- Attending of gland leakages of Booster Pump suction valve, BFP discharge valve, Balancing valve, recirculation valve, Discharge NRV, Recirculation isolation valve, attending leakage from orifice flange and Recirculation NRV.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.
- Cooler repair/replacement.
- Gear replacement.
- Mechanical seal replacement of BFPs and booster pump.

MAINTENANCE OF VALVES / NRV'S
- Attending gland leakages either by tightening or by replacing the glands.
- Hot tightening of gland nuts.
- Removal and refixing of valve actuators of all type.
- Greasing of valves of all sizes as per requirement.
- Attending flange / Bonnet leakages either by tightening or by replacing the gasket / seal ring.
- Hot tightening of flange or bonnets.
- Removal / refixing of cladding / insulation required for completion above job.
- Repair/Replacement of Valves as per requirement.
- Replacement of valves as per instruction of EIC.
- Attending the problem valve mechanical jamming.
- Welding of handles / putting new handles to the valve.
- Repair and revival of damaged valves/ parts of valves such as discs, spindles, bonnets etc.
- Leakage attending of Gauge glasses of Deaerator, HP Heaters, LP Heaters & Tubular gauge Glasses.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE ON CRANE / MONORAIL TROLLEYS / CHAIN PULLEY BLOCKS
- Lubricate the bearing with grease EP2.
- Check the condition of coupling bushes.

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
• Check the break adjustment / liner condition.
• Lubricate the wire rope with cardium compound.
• Check the foundation bolt tightness.
• Check the oil level if level is low top-up.
• Assisting and carrying out load test of the above as per the requirement of Load testing
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

ELEVATOR
Preventive, routine maintenance of elevator and its subassemblies (gearboxes, transmission shaft, couplings, rollers, hoist drum, ropes, Doors etc..) and providing assistance to the expert. However Capital overhauling of Lifts & its accessories is excluded.

MAINTENANCE ON EOT OF TURBINE HALL
• Greasing of bearings.
• Check the oil level of thruster brake, if low top-up with transformer oil.
• Lubrication of rope with cardium compound/servo coat.
• Check the brake adjustment / liner condition and replacement of brake in if required.
• Check the foundation bolt tightness.
• Check the rail alignment and holding down bolts of rail.
• Repair/Replacement/Routine Maintenance of LT/CT Gearbox
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.
• Assisting and carrying out load test of the above as per the requirement of Load testing

MAINTENANCE OF CONDENSATE EXTRACTION PUMP
• Carry out external cleaning of equipment.
• Removal of platforms/grid plate above the CEP for the approach of the EOT
• Removal of CEP motor and coupling
• Check all joints & Valve Glands for leakages, if leakage is to be observed, same to be attended either by replacing the glands or by tightening it.
• Check all holding down bolts for tightness and take corrective action if required.
• Check thrust bearing oil level in the thrust bearing gauge glass, if level is low top-up with oil.
• Check the tightness of coupling bolts.
• Attend all leakages/air ingress either by welding/replacement of gland/gaskets.
• Check for pump mechanical seal, if leakage is to be observed, same to be attended either by replacing the seal or servicing it.
• Checks the alignment of Pump with respect to Motor, and do the necessary correction if required.
• Cleaning of suction strainers
• Replacement of pump inlet line bellow
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.
• Replacement of Mechanical Seal
MAINTENANCE OF CONDENSER VACUUM PUMP

- Carry out external cleaning of equipment.
- Check all valves for gland leakage if leakage is to be observed, same to be attended either by replacing the glands or by tightening it.
- Check the foundation bolt tightness and take corrective action if required.
- Check for pump gland leakage, if leakage is observed, same to be attended either by replacing the glands or by tightening it.
- Inspection of bearings of Pump.
- Clean strainers for makeup water & seal liquid line.
- Bearing and coupling greasing to be done.
- Attend all leakages either by welding/replacement of gland/gaskets.
- Cleaning of seal water coolers and PHE of the vacuum pump.
- Checking of coupling spider and replacement if required.
- Checking of alignment of Pump with Motor and do the necessary correction if required.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE OF OCCW, CCCW, CONDENSER MAKE UP WATER AND SLUCE PUMP SYSTEMS

- Carry out external cleaning of equipment.
- Carry out the inspection /replacement of strainer mesh in the OCCW electric strainer.
- Check all valves for gland leakage, if leakage is to be observed, same to be attended either by replacing the glands or mechanical seal or by adjusting it.
- Check the foundation bolt tightness and take corrective action if required.
- Repair/Replacement of Booster Pumps.
- Inspection / Replacement of bearings of Pumps.
- Inspection / Replacement of coupling of Pumps.
- Inspection / Replacement of gland seal/sleeve of Booster Pumps.
- Carry out bearing greasing.
- Removal of coupling guards and checking the tightness of coupling bolts.
- Attend all leakages
- Check the freeness of discharge NRV, if required attending gland leakage of the NRV.
- Check the condition of discharge valve, if there is any leakage in flanges or gland same to be attended.
- Cleaning of Plate Heat Exchanger as and when required.
- Checking of alignment of Pump with Motor and do the necessary correction if required.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE OF CONDENSER ON LINE TUBE CLEANING SYSTEM

- Carry out external cleaning of equipment.
- Check all joints for leakages if any arrest it either by tightening or by replacing the glands.
- Check all holding down bolts for tightness & take corrective action if required.
- Check coupling spider for damage, if necessary replace it.
- Check the recirculation pump oil level, if level is low top-up.
- Attend all leakages either by welding/replacement of gland/gaskets.
- Repair/Replacement of Pump/ Replacement of bearings.
- Maintenance of DP flushing line/ Ball separator screens/Suction / Discharge valves of ball vessels and ball collecting strainer of CW line
- Loading, sorting and replacement of balls
- Check gland leakages if any arrest it if leakage is to be observed, same to be attended either by replacing the glands or by tightening it.
- Checking of alignment of Pump with Motor and do the necessary correction if required.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE ON GSC FANS

- Carry out external cleaning of equipment.
- Check all joints for leakages if any arrest it.
- Check all holding down bolts for tightness and take corrective action if required
- Attend all leakages either by welding/replacement of gland/gaskets.
- Repair/Replacement of fans/Replacement of Impeller.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MISCELLANEOUS MAINTENANCE

- Maintaining and upkeepment of site stores, which includes fabrication of racks, almirahs, shifting of material required for stores from Central stores to Site stores, etc.
- Removal, replacement / rectification of gratings, hand rails, staircases, etc.
- Preparation of scaffolding required for on line leak sealing and other misc work.
- Identification of leakages by removal of insulation and refixing of the insulation when ever required.
- Assistance in taking oil samples from Turbine bearing pedestals / MOT / HP Bypass Oil unit / LP bypass oil unit / hydraulic Coupling / Fresh oil drum.
- Centrifuging / filtration of BFP / HP Bypass/ LP Bypass system oil by portable centrifuge / filtration unit.
- Maintaining the cleanliness of the maintenance /lifting bay.
- Drafting drawing with the dimension for reverse engineering or development or for procurement of spares.
- Shifting of all type of spares and consumables from the main stores to maintenance field.
- Shifting of all types of scraps to the scrap yard
- Removal and shifting of waste insulation and castables of turbine and turbine auxiliaries from plant.
- Inspection ,testing and setting of all safety valves in the turbine and turbine auxiliaries and its associated pipe line
- Repair / revival of damaged assemblies such as mechanical seal assemblies, valves, Dosing pumps, Dewatering pumps & its actuators, seal oil /leak oil /clean oil pumps etc.

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
Any type of minor modification & repair work such as provision of hand rails, minor fabrication, platform fabrication work will be treated as routine work.

Replacement of rupture diaphragms of LPT & TDBFPs diaphragm at the time of black out and attending oil leakages if any and when required from TG and TDBFP proper oil lines.

All pipelines and its fittings leakages to be arrested either by replacing it or by doing online sealing.

Assisting for the effective implementation of various quality systems and other advance systems.

Cleaning of all pipe lines, valves, condenser external surface, enclosers, tanks, all equipment.

Cleaning of TDBFP turbine and main turbine casings, pipe lines and valves

Sealing the dust ingress points in the turbine and its auxiliaries area.

Service Provider will perform online sealing either by on its own or by giving further subcontracting whose cost shall be borne by Service Provider itself.

Decoupling, Shifting to maintenance bay and reinstall with alignment of all HT and LT Motors

Packing of damaged equipments or its spares for sending to external parties if required.

Cleaning and maintaining of emergency oil pit

Decoupling of all LT Motors

Cooler cleaning of all Motors

Repair of insulation and sheet.

Replacement of HP/LP Heaters Gasket

Replacement, repair and hydro testing of all type of drain valves

PREVENTIVE & ROUTINE MAINTENANCE OF BALANCE OF PLANT EQUIPMENTS

MAINTENANCE OF CW PUMP

- Carry out external cleaning of equipment.
- Check the oil level of pump thrust bearings if low top-up with suitable oil or equivalent grade of oil.
- Check the tightness of foundation bolt & take corrective action if required.
- Check the tightness of coupling bolt & take corrective action if required.
- Check the gland packing if excessive water, if found arrest it either by tightening or by replacing the glands.
- Check the alignment of pump & motor and take corrective action
- Check the flow of water through thrust bearing cooler if interruption noticed flush the water line or take corrective action.
- Check for any oil / water leakages from valves, flanges etc if noticed take corrective action for arresting the leakages.
- Clean the trash rack screen/ Strainers, if found damaged replace / repair the same.
- Greasing of stop log gates & associated valves in CW System.
- Preventive maintenance of hydraulic system of CW discharge valve.
- Assisting during underwater services of CW Pump, including arrangement of divers etc.
- Removal of grating & fixing the same.
- Take trial run for smooth operation.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

**MAINTENANCE OF COOLING TOWER & ITS ACCESSORIES**

- Carry out external cleaning of equipment.
- Check the oil level of gear box if low top-up with oil.
- Check the oil leakage in gear box & local level glass if leakage found then take corrective action.
- Check the tightness of foundation bolt gear box & take corrective action if required.
- Check the tightness of coupling bolt & take corrective action if required.
- Check the tightness of U bolt in between fan blade & gear box if loose then tighten.
- Check the alignment of gear shaft & motor and take corrective action.
- Check & adjust the pitch angle of fan blade.
- Check and clean the all pipe nozzles and clean other debris inside the cooling tower cell.
- Check the tightness of bolts in all flange joint if loose then tighten and attend all leakages.
- Check the riser pipe valve if jam then repair the same.
- Clean the trash rack screen in cooling tower if damaged replace / repair the same.
- Check the tightness of bolts in gear box cover & take corrective action if required.
- Check the fill pack position if found disturbed then align it to original position.
- Check the leakage from PVC pipe inside the cooling tower if so then attend & realign the same.
- Removal of grating & fixing the same.
- Greasing of associated valves in Cooling tower System.
- Assisting during underwater services of cooling tower basin etc.
- Take trial run for smooth operation.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.
- Routine Maintenance of CT fan Gearbox

**MAINTENANCE OF VALVES / NRVS / BUTTERFLY VALVES / AIR RELEASE VALVES / RUBBER EXPANSION JOINTS & ACTUATORS**

**TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS**
• Carry out the external cleaning of equipment.
• Attending gland leakages either by tightening or by replacing the glands.
• Attending flange / Bonnet leakages either by tightening or by replacing the gasket / seal ring.
• Attending the problem of valve mechanical jamming.
• Attending water leakage from Hydrant pipe under & above ground line either by replacement of pipe line or by repair welding.
• Attending oil leakage from actuators / expansion joint and topping up oil.
• Greasing of valves & oil top up in actuators of all sizes as per requirement.
• Attending flange / Bonnet leakages either by tightening or by replacing the gasket etc.
• Adjust the setting of rubber expansion joints.
• Welding of handles / putting new handles to the valve.
• Replacement of valves such as Hydrant angle valve, alarm valve and deluge valve against routine defects.
• Repair and revival of damaged valves / parts of valves such as discs, spindles, bonnets etc.
• Removal of grating & fixing the same.
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE OF DIESEL GENERATOR SET

• Carry out external cleaning of equipment.
• Check the Lub oil level if low top up with approve brand of oil
• Check the tightness of foundation bolt & take corrective action if required.
• Check the coupling in between engine and generator if found damaged then replace and realignment to be done
• Check the radiator water level if low top up with water.
• Check the tightness of radiator fan belt.
• Clean the inlet air filter elements if damaged replace the same.
• Check for any leakage in oil, diesel & water system if found then attend the same.
• Clean / check the lube oil filter element.
• Check the alignment of engine and generator and take corrective action
• Change the lube oil & lube oil filter element. Thoroughly soak the density type strainer element in clean fuel oil before installing.
• Change the diesel filter element.
• Assisting for inspection / repair / servicing during expert visit as per instructions.
• Top up of diesel as and when required.
• Take trial run for smooth operation.
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE OF COMPRESSOR AND CHILLER, HVAC
• Carry out external cleaning of equipment.

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
• Check the oil level in the tank if low top-up with oil.
• Change the lube oil & lube oil filter element. Thoroughly soak the density type strainer element in clean fuel oil before installing.
• Check the tightness of foundation bolt & take corrective action if required.
• Check the coupling in between compressor and motor if found damaged then replace and realignment to be done.
• Check & clean the air breather in oil tank.
• Clean the inlet air filter element primary and secondary and replacement on need basis.
• Check / Replace the inlet air filter element primary and secondary.
• Check / clean the internal tube in all cooler.
• Check the leakage in oil line, water line and air line if found then tighten the same.
• Assisting for inspection / repair / servicing during expert visit as per instructions.
• Take trial run for smooth operation.
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

**MAINTENANCE OF AIR DRIER**
• Carry out external cleaning of equipment.
• Clean the suction filter/ moisture strainer.
• Check the tightness of foundation bolts & take corrective action if required.
• Assisting for inspection / repair / servicing during expert visit as per instructions.
• Inspection of rectification of refrigerant leakage in the system.
• Filling of refrigerant gas/alumina balls as per requirement.
• Take trial run for smooth operation.
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

**MAINTENANCE OF SUBMERSIBLE PUMP**
• Carry out external cleaning of equipment.
• Check & clean the strainer of submersible pump.
• Shifting of pump from one pit to another pit including discharge pipe, electric cable etc
• Dismantle the discharge pipe, electric cable from panel.
• Assemble the discharge pipe, termination of cable in panel as well as pump.
• Dismantling & refitting the gratings / cover in the pit for erection and dismantle of pump.
• Take trial run for smooth operation.
• Complete servicing of Submersible pump
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

**MAINTENANCE OF RAW WATER PUMP**
• Carry out external cleaning of equipment.
• Check the oil level of pump thrust bearings if low top-up oil.
• Check the tightness of foundation bolt if loose then tighten.
• Check the tightness of coupling bolt if loose then tighten.

**TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS**
- Check the gland packing for excessive water leakage, if found arrest it either by tightening or by replacing the glands.
- Check the alignment of pump & motor and take corrective action.
- Check the flow of water through thrust bearing cooler if interrupt noticed flush the water line or take corrective action.
- Check the tightness of bolts in all flanges joint if loose then tighten and attend all leakages.
- Removal of grating & fixing the same.
- Clean the thrash rack strainer if damaged replaced / repaired the same.
- Take trial run for smooth operation.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE OF FIRE WATER PUMP

- Carry out external cleaning of equipment.
- Check the oil level of pump thrust bearings if low top-up with oil.
- Check the tightness of foundation bolt if loose then tighten.
- Check the tightness of coupling bolt if loose then tighten.
- Check the gland packing for excessive water leakage, if found arrest it either by tightening or by replacing the glands.
- Check the alignment of pump & motor and take corrective action.
- Check the tightness of bolts in all flange joint if loose then tighten.
- Check the flow of water through thrust bearing cooler if interrupt noticed flush the water line or take corrective action.
- Check the tightness of bolts in all flange joint if loose then tighten and attend all leakages.
- Removal of grating & fixing the same.
- Clean the strainers if damaged replaced / replaced the same.
- Take trial run for smooth operation.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE OF JOCKEY PUMP

- Carry out external cleaning of equipment.
- Check the tightness of foundation bolt if loose then tighten.
- Check the tightness of coupling bolt if loose then tighten.
- Check the gland packing for excessive water, if found arrest it either by tightening or by replacing the glands.
- Check the alignment of pump & motor and take corrective action.
- Check the tightness of bolts in all flange joint if loose then tighten and attend all leakages.
- Removal of grating and fixing the same.
- Clean the thrash rack strainer if damaged replaced / repaired the same
- Take trial run for smooth operation.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE OF DIESEL ENGINE FOR FIRE WATER PUMP
- Carry out external cleaning of equipment.
- Check the Lub oil level if low top-up with approve brand of oil
- Check the tightness of foundation bolt if loose then tighten the same.
- Check the coupling in between engine and pump if found damaged then replace and realignment to be done
- Clean the radiator water level if top up with water.
- Check the tightness of radiator fan belt.
- Clean the inlet air filter element if damaged replaced the same.
- Check for any leakage in oil, diesel & water system if found then tighten the same.
- Clean / check the lube oil filter element.
- Change the lube oil & lube oil filter element. Thoroughly soak the density type strainer element in clean fuel oil before installing.
- Change the diesel filter element.
- Take trial run for smooth operation.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE OF BOOSTER PUMP FOR FIRE WATER SYSTEM
- Carry out external cleaning of equipment.
- Check the condition of the coupling and spider if broken then replace the same.
- Check the gland leakage if heavy then tightens or replace the gland packing.
- Check the tightness of foundation bolt if loose then tighten the same.
- Check the coupling in between engine and pump if found damaged then replace and realignment to be done
- Carry out pump bearing greasing.
- Take trial run for smooth operation.
- Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE OF HYDRANT VALVES / MONITORS / ALARM VALVES / DELUGE VALVES / GATE VALVES ETC. FOR FIRE WATER SYSTEM
- Carry out the external cleaning of valves.
- Attending gland leakages either by tightening or by replacing the gland / rubber seat / hand hole cover gasket.
- Attending flange / Bonnet leakages either by tightening or by replacing the gasket / seal ring.
- Attending the problem of valve mechanical jamming.
- Welding of handles / putting new handles to the valve.
- Attending line & valve leakages by welding or replacing glands.
- All types of replacement of valve against passing & body leakages.
• Repair and revival of damaged valves/ parts of valves such as discs, spindles, bonnets etc.
• Check periodically for functioning of spray water system and repair/replace nozzle if required.
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE ON EOT CRANE
• Carry out external cleaning of equipment.
• Greasing of bearings.
• Check the oil level of thruster brake, if low top-up with transformer oil.
• Lubrication of rope with cadmium compound.
• Check the brake adjustment / liner condition.
• Check the oil level in gearbox if level is low top-up.
• Take trial run for smooth operation.
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.
• Assisting and carrying out load test of the above as per the requirement of Load testing

MAINTENANCE ON HOIST
Carry out external cleaning of equipment.
• Greasing of bearings.
• Check the oil level of thruster brake, if low top-up with transformer oil.
• Lubrication of rope with cadmium compound.
• Check the brake adjustment / liner condition.
• Check the oil level in gearbox if level is low top-up.
• Take trial run for smooth operation.
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.
• Assisting and carrying out load test of the above as per the requirement of Load testing

PREVENTIVE MAINTAINENCE OF CHEMICAL PUMPS OF DM PLANT/CONDENSATE POLISHING UNIT AND SWAS SYSTEM
• All Preventive maintenance of HCL / NaOH/H2SO4/ and misc dozing pumps of DM plant.
• Arresting any leakages from pup body/pipe line flanges/tanks guage glass/and fittings.
• Ensuring healthiness of accidental eye wash system.
• Replacement of pumps if required.
• Motor replacement to be done if required.
• Checking for gland leakages and arresting it by tightening/replacing packing.
• Protective coating /lining in pump body/valves and pipelines if required.
• Cleaning of tanks and protective coating /lining to be done.
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE OF AERATOR:

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
• Maintenance of valves and associated pipelines with aerator.
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE OF INCLINED FILTER BASIN/CLARIFIER:
• Dewatering of basin by using suitable dewatering pump.
• Cleaning of basing and removal of mud/sludge.
• Replacing/cleaning of inclined screen filter elements.
• Servicing/replacement of mud pumps.
• Maintenance of associated valves and pipelines of the system.
• Routine maintenance of Agitator
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE OF S&M PUMP:
• Cleaning of equipment.
• Checking of foundation bolt and tightening.
• Checking and arresting any leakages from pump body/gland/valve body/pipeline flange etc by replacing packings or gaskets.
• Replacement of motor after alignment checking.
• Checking of rubber spider and alignment on monthly basis.
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE OF CENTRIFUGAL PUMPS OF DM PLANT:
• Cleaning of equipment.
• Checking of foundation bolt and tightening.
• Checking and arresting any leakages from pump body/gland/valve body/pipeline flange etc by replacing packings or gaskets.
• Replacement of motor after alignment checking.
• Checking of rubber spider and alignment on monthly basis.
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE OF RESERVIORS AND FILTERS:
• Draining of reservoir/filter tank by using suitable dewatering pump.
• Removal of mud/sludge from the reservoir.
• Cleaning/replacing of screen filter element as required or instructed.
• Refilling of tank/reservoir.

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
• Maintenance of valves and pipelines associated with tank/reservoir

MAINTENANCE OF FUEL OIL PUMP HOUSE OIL SUPPLY/TRANSFER PUMPS:
• Carry out external cleaning of equipment.
• Checking of foundation blots of pumps and its tightening if required.
• Cleaning of suction strainers of HFO/LDO supply pumps and its replacement if necessary.
• Check for oil leakages through pumps, flanges seals etc and arresting the leakages by replacing/tightening seals.
• Pump and motor replacement if necessary.
• Checking spider and alignment checking of motor and pump in monthly basis.
• Cleaning/replacement of discharge filters.
• Repair/Replacing of Pressure control/regulator valves.
• Mechanical seal/oil seal leakage arresting either by replacing whole part or by replacing defective part as per instruction of EIC.
• Attending steam/oil leakages from associated pipelines and valves.
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE OF HEATER/COOLER:
• Carry out external cleaning of equipment.
• Arrest any steam/oil/water leakages if any.
• Removal and recladding of insulation after work completion.
• Checking for any tube leakages in heater/cooler.
• Plugging of tubes if required.
• Carry out hydro test of the heat exchangers and carry out repairs if any.
• Arresting leakages of associated pipelines/valves etc either by welding or replacing.
• Checking foundation of cooling water pump.
• Check coupling and alignment of cooling water pump monthly basis.
• Replace/service pump if required.
• Cleaning of suction/discharge strainer as and when required.
• Spill over oil / water / grease / cotton waste / etc in surrounding area and floor to be cleaned up to the satisfaction of EIC.

MAINTENANCE OF DIRTY OIL PIT:
• Draining of pit by using suitable dewatering pump.
• Removal of sludge/mud from the pit.
• Cleaning of pit.
• Checking foundation of pump and its coupling.
• Checking and arresting any steam/water/oil leakages in pumps and associated pipelines and valves if any.
• Periodic cleaning of air breather.
• Replacement/repair of pumps as if needed.

HYDROGEN GENERATION PLANT

• Maintenance all Mechanical equipment of Hydrogen Generation Plant which include Frame of Hydrogen Production, Frame of Hydrogen Distribution, Frame of water tank & alkali tank, Rectifying device, Distribution Device, De mineralized water cooling device.
• Maintenance of Oxygen Separator, Hydrogen Separator, Hydrogen Launder or syringe, De oxygenating Equipment, Receiver Tank & Dryer are in contractor’s scope.
• Hydrogen transfer from Hydrogen Generation Plant to Hydrogen Manifold from where Hydrogen will be distributed to different units will in contractor’s scope.
• Leakages detection and rectifications of leakage detectors in all Hydrogen Plant Area will be in the scope of contractor.
• Shifting of spares & other materials to the working location is in the contractor’s scope (from Stores, work shop etc.). Shifting vehicle is to be provided by contractor for shifting of materials from stores, workshop and other department within plant premises.
• Replacement of KOH (or NAOH) as and when required will be in the scope of contractor.
• Receiver Safety Valve setting yearly will be in contractor’s scope.
• Yearly once makeup of dry desiccators of all driers.
• Yearly replacements of filters & gas water separator cartridge.
• Nitrogen cylinder under the scope of contractor.
• Hose pipe for water spraying & Air blowing in Hydrogen Generation Plant will be in contractor’s scope.
• Drain Water should not accumulate on Hydrogen Generation Plant trench, Surface water trench & storm water drain (surrounding the Hydrogen Generation Plant), cleaning the same is in contractor’s scope.
• Contractor has to follow all standards of ISO systems (like check lists implementations, training record, training schedule & SOP preparation and implementations etc).
• Repair of underground pipelines at Hydrogen Generation Plant area is in Contractors scope, any excavation required to be done by contractor.
• During annual overhauling, cleaning of all area will be in contractor’s scope.
• Hydrogen Generation discharge line tracing and Detection will be in contractor’s scope.
• Maintenance of fire system in Hydrogen Generation Plant will be in contractor’s scope.
• Excavation work required for all underground pipes related to Hydrogen Generation Plant is in contractor’s scope.

General/Routine Activities

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
1. Any other miscellaneous work not mentioned above but required for routine maintenance is included in the scope of Service Provider.
2. The Service Provider has to follow the BALCO work permit system.
3. House-keeping, equipment cleaning and area cleaning of the whole maintenance bay after maintenance shall be in scope of Service Provider.
4. All HT Motors decoupling, removal and Shifting to maintenance bay & back to its position, installation & alignment will be in the Service Provider’s scope.
5. All LT Motors Decoupling and alignments is in the Scope of Service Provider’s.
6. Central Material Management shall be part of BALCO scope. Service Provider will draw Material / spare parts from there. Handling & transportation of materials / spare parts to work place for temporary storage / usage shall be in Service Provider's scope. Segregation and Disposal of scrap to the scrap yard shown by the BALCO Engineer In-Charge is in the scope of the Service Provider.
7. Loading & Unloading of the materials sending outside/receiving inside the plant premises for repair is in the scope of Service Providers.
8. Only those Special T&P's which were provided by OEM shall be handed over to Service Provider. All other T&P irrespective of its nature being either special or general are in the scope of Service Provider.
9. Operation and Maintenance of (BTG+BOP) EOT crane & hoist shall be in Service Provider’s scope.
10. Service Provider shall indicate manpower strength-category wise. Qualification and experience shall also be mentioned.
11. Online sealing of pipes, bends, reducers, pipe fittings, instruments and its fittings, valve bonnets, flanges, glands will all come in Service Provider’s scope.
12. Insulation removal and fixing before and after work completion will come under Service Provider’s scope.
13. All consumables like all type of rope & all types of gaskets except Spiral wound Gasket etc are in Service Provider scope.
14. Timely Preventive Maintenance of equipments as per the Schedule provided by BALCO’s EIC is in Service Provider’s scope.
15. Maintenance report, spare reconciliation reports have to be provided on Daily/Monthly/Yearly basis by the Service Provider.
16. Any metal built up or hard facing of any equipment will be in Service Provider’s scope. Special electrode will be provided by owner.
17. Welding and cutting required to perform the maintenance activities is in Service Provider’s scope. Availability of the welding machines and cutting sets and its maintenance shall be in Service Provider’s scope along with gas.
18. Activity required for underground pipeline leakage arresting will be in the scope of Service Provider.
19. Service Provider can use existing workshop facility available at BALCO for machining & repair work and for any job which is required to be done at outside workshop Service Provider has to arrange for the same at BALCO’s cost.
20. Liaison & coordination with Boiler Inspector will be in Service Provider’s scope.
21 Any other routine preventive Maintenance activity/minor breakdown activities which are not list above will also be a part of Service Provider scope.

22 Safety - Ensuring usage of appropriate PPEs during work;

1. Service Provider has to strictly follow the safety work permit system and safety rules of BALCO.
2. All the Service Provider persons working in site are required to have proper PPEs. Failure to comply with it will attract the penalty of Rs 50 per person per day.
3. For works to be executed at height Service Provider has to make proper scaffolding and approach to satisfaction of engineer in-charge before start of execution of any job. The job cannot be started without consent of engineer in-charge in such cases.
4. The Service Provider has to provide safety belt, safety harness and safety net where ever applicable and get is certified by the engineer in-charge before start of the job.
5. Permits to be taken before starting any work, hot work permit is compulsory for any welding or cutting job. Job safety analysis is to be done
   a. Reporting of near miss incident.
   b. Hazard identification and elimination on daily basis.
   c. Ensuring Maintenance of fire fighting pipe lines and spray valves.

**Break Down failure & Root Cause Analysis Report:**
For any type of breakdown Service Provider must be submit a failure analysis report within 72 hours with proper justification.

**LIST OF CONSUMABLES**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Kerosene, diesel, petrol, liquid adhesive, grease and rustolene.</td>
</tr>
<tr>
<td>02</td>
<td>CTC, molycoat, graphite powder</td>
</tr>
<tr>
<td>03</td>
<td>Hacksaw blades.</td>
</tr>
<tr>
<td>04</td>
<td>Cotton waste.</td>
</tr>
<tr>
<td>05</td>
<td>Marking cloth and old cloth.</td>
</tr>
<tr>
<td>06</td>
<td>Asbestos cloth.</td>
</tr>
<tr>
<td>07</td>
<td>Prussian blue.</td>
</tr>
<tr>
<td>08</td>
<td>Lead wire (1.0 mm, 1.5 mm, 0.5 mm)</td>
</tr>
<tr>
<td>09</td>
<td>Liquid soap/soap powder.</td>
</tr>
<tr>
<td>10</td>
<td>Carborundum grinding paste (fine, medium and coarse)</td>
</tr>
<tr>
<td>11</td>
<td>Cut off wheels.</td>
</tr>
<tr>
<td>12</td>
<td>Grinding wheels.</td>
</tr>
<tr>
<td>13</td>
<td>Sealing agents like M seal etc</td>
</tr>
<tr>
<td>14</td>
<td>Adhesive agents like loctite, Silastic etc</td>
</tr>
<tr>
<td>15</td>
<td>Cleaning agents like WD-40, Terpentine oil etc</td>
</tr>
<tr>
<td>16</td>
<td>Oil stones.</td>
</tr>
</tbody>
</table>
17. Mounted wheels and rotary cutters.
18. Oxygen and D/A cylinders.
19. DP test kit and coir rope.
20. Chalks, marking pens, and thermal chalks up to 600°C
21. Insulation and medical tapes.
22. Polythene sheets.
23. Material for blast cleaning purposes.
24. Hand gloves (asbestos and rubber), manila rope.
26. Gum boots, face shield, high temperature suits, gloves.
27. Electric drills of various sizes
28. Ball pen hammer of various sizes.
29. Electric switchboards and floor light arrangements.
30. Magnifying glasses.
31. Safety Helmets for labors.
32. Gas cutting and welding goggles.
33. Argon gas welding equipment.
34. Hand gloves Cotton & Leather.
35. Shims of various thickness and material.
36. Fastner (bolts, nuts, screw excluding HT)
37. Plastic bucket / drum.
38. Air hose up to 1”.
39. Drilling bits of different sizes.
40. Welding electrode and fillers.
41. Sealant putty
42. Gland Ropes of different sizes and capacity. rope, graphite, metallic high temp and pressure application
43. Scrotch brite, plastic and wire brushes
44. Gas cutting set equipment
45. Detergents.
46. Oil/water/paper/rubber & metallic gaskets (Special high temp and high pressure)

<table>
<thead>
<tr>
<th>S.No</th>
<th>Item</th>
<th>Spec.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Welding Generator with Regulator DC and rectifomer type</td>
<td>Standard make</td>
</tr>
<tr>
<td>2</td>
<td>Welding Transformer</td>
<td>Standard make</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Capacity</td>
</tr>
<tr>
<td>---</td>
<td>------------------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>3</td>
<td>Chain Pulley Blocks</td>
<td>10T</td>
</tr>
<tr>
<td>4</td>
<td>Chain Pulley Blocks</td>
<td>5T</td>
</tr>
<tr>
<td>5</td>
<td>Chain Pulley Blocks</td>
<td>3T</td>
</tr>
<tr>
<td>6</td>
<td>Chain Pulley Blocks</td>
<td>2T</td>
</tr>
<tr>
<td>7</td>
<td>Chain Pulley Blocks</td>
<td>1T</td>
</tr>
<tr>
<td>8</td>
<td>Pulling Lifting M/c</td>
<td>3T</td>
</tr>
<tr>
<td>9</td>
<td>Pulling Lifting M/c</td>
<td>1.5T</td>
</tr>
<tr>
<td>10</td>
<td>D/E Open Spanners</td>
<td>Up to 60</td>
</tr>
<tr>
<td>11</td>
<td>D/E Ring Spanners</td>
<td>Up to 60</td>
</tr>
<tr>
<td>12</td>
<td>S/E Long handle Open Spanners</td>
<td>50, 55, 60, 65, 70, 75</td>
</tr>
<tr>
<td>13</td>
<td>Star Hammering Spanners</td>
<td>24, 30, 32, 36, 41, 46, 50, 55, 60, 65, 70, 75</td>
</tr>
<tr>
<td>14</td>
<td>Box Spanner</td>
<td>6 to 50</td>
</tr>
<tr>
<td>15</td>
<td>T - Handle for above</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Tubular Spanner</td>
<td>6 x 7 to 30 x 32</td>
</tr>
<tr>
<td>17</td>
<td>Adjustable Spanner</td>
<td>12&quot;, 6&quot;</td>
</tr>
<tr>
<td>18</td>
<td>Pipe Wrench</td>
<td>24&quot;, 18&quot;, 12&quot;, 6&quot;</td>
</tr>
<tr>
<td>19</td>
<td>Screw Driver</td>
<td>18&quot;, 12&quot;</td>
</tr>
<tr>
<td>20</td>
<td>Torque Wrench</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Combination Pliers</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Outside Circlip Pliers</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Inside Circlip Pliers</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Nose Pliers</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Hydraulic jack with pump</td>
<td>100 T</td>
</tr>
<tr>
<td>26</td>
<td>Hydraulic jack with pump</td>
<td>50T</td>
</tr>
<tr>
<td>27</td>
<td>Button Hydraulic Jack Pump</td>
<td>20T</td>
</tr>
<tr>
<td>28</td>
<td>Crow Bar</td>
<td>1&quot;</td>
</tr>
<tr>
<td>29</td>
<td>Temperature Gun</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Pipe Bending Machine</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Motorized Chain Block</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Sledge Hammer</td>
<td>20lbs, 10lbs, 4lbs</td>
</tr>
<tr>
<td>33</td>
<td>BP Hammer</td>
<td>1.5lbs</td>
</tr>
<tr>
<td>34</td>
<td>Outside Micrometer</td>
<td>0 - 25</td>
</tr>
<tr>
<td>35</td>
<td>Outside Micrometer</td>
<td>0 - 150</td>
</tr>
<tr>
<td>36</td>
<td>Outside Micrometer</td>
<td>150 - 300</td>
</tr>
<tr>
<td>37</td>
<td>Outside Micrometer</td>
<td>300 - 400</td>
</tr>
</tbody>
</table>

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>38</td>
<td>Inside Micrometer</td>
<td>50 - 500</td>
</tr>
<tr>
<td>39</td>
<td>Inside Micrometer</td>
<td>50 - 1000</td>
</tr>
<tr>
<td>40</td>
<td>Vernier Caliper</td>
<td>12”</td>
</tr>
<tr>
<td>41</td>
<td>Vernier Caliper</td>
<td>6”</td>
</tr>
<tr>
<td>42</td>
<td>Dial Gauge with Magnetic Stand</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Allen Key</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Allen Key</td>
<td>14, 16, 20, 24</td>
</tr>
<tr>
<td>45</td>
<td>Gas Cutting Set</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Argon Set</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>Welding Cable</td>
<td>400 amps</td>
</tr>
<tr>
<td>48</td>
<td>Master Level</td>
<td>4”</td>
</tr>
<tr>
<td>49</td>
<td>Spirit Level</td>
<td>8”</td>
</tr>
<tr>
<td>50</td>
<td>Plum bob</td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>Shim Cutter</td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>Angle Grinder</td>
<td>AG - 7</td>
</tr>
<tr>
<td>53</td>
<td>Angle Grinder</td>
<td>AG - 5</td>
</tr>
<tr>
<td>54</td>
<td>Angle Grinder</td>
<td>AG - 4</td>
</tr>
<tr>
<td>55</td>
<td>Straight Grinder</td>
<td>GQ - 4</td>
</tr>
<tr>
<td>56</td>
<td>Flexible Shaft Grinder</td>
<td>FF - 2</td>
</tr>
<tr>
<td>57</td>
<td>High Speed Grinder</td>
<td>HSG</td>
</tr>
<tr>
<td>58</td>
<td>Portable Drilling M/c</td>
<td>upto 12 mm</td>
</tr>
<tr>
<td>59</td>
<td>Hole Punch</td>
<td>Assorted Size</td>
</tr>
<tr>
<td>60</td>
<td>Drill machine magnetic type</td>
<td>Assorted Size</td>
</tr>
<tr>
<td>61</td>
<td>Wire Rope Slings</td>
<td>Assorted Size</td>
</tr>
<tr>
<td>62</td>
<td>Eye Bolt</td>
<td>Assorted Size</td>
</tr>
<tr>
<td>63</td>
<td>Wooden Sleepers</td>
<td></td>
</tr>
<tr>
<td>64</td>
<td>Scaffolding Pipes cupp lock type</td>
<td>6 mtrs length</td>
</tr>
<tr>
<td>65</td>
<td>Scaffolding Pipes cupp lock type</td>
<td>3 mtrs length</td>
</tr>
<tr>
<td>66</td>
<td>Scaffolding Clamps (Fixed type)</td>
<td></td>
</tr>
<tr>
<td>67</td>
<td>Scaffolding Clamps (Swivel Type)</td>
<td></td>
</tr>
<tr>
<td>68</td>
<td>Scaffolding Planks (Metallic)</td>
<td></td>
</tr>
<tr>
<td>69</td>
<td>Puller for removal of bearing and coupling.</td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>Measuring Tape</td>
<td></td>
</tr>
<tr>
<td>71</td>
<td>Non sparking tool kit spanner slide wrench</td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>Electric bolt tightening machine.</td>
<td></td>
</tr>
<tr>
<td>73</td>
<td>Aluminium Ladder A type</td>
<td></td>
</tr>
<tr>
<td>S.No</td>
<td>Description</td>
<td>Routine</td>
</tr>
<tr>
<td>------</td>
<td>-------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Expert services for compressors</td>
<td>Quaterly and Need basis</td>
</tr>
<tr>
<td>2</td>
<td>Expert services for DG sets</td>
<td>Quaterly and Need basis</td>
</tr>
<tr>
<td>3</td>
<td>HP line online sealing</td>
<td>Need basis</td>
</tr>
<tr>
<td>4</td>
<td>Steel structure erection &amp; fabrication</td>
<td>Daily</td>
</tr>
<tr>
<td>5</td>
<td>Oil filtration &amp; analysis (analysis quarterly)</td>
<td>Daily</td>
</tr>
<tr>
<td>6</td>
<td>CBM(Vibration)</td>
<td>Daily</td>
</tr>
<tr>
<td>7</td>
<td>Reverse engineering services(Drawing development)</td>
<td>Daily</td>
</tr>
<tr>
<td>8</td>
<td>Turbine expert services</td>
<td>Need Basis</td>
</tr>
<tr>
<td>9</td>
<td>Condenser bullet &amp; jet cleaning</td>
<td>Need Basis</td>
</tr>
<tr>
<td>10</td>
<td>PHE cleaning</td>
<td>Need Basis</td>
</tr>
</tbody>
</table>

Note: The above list of Tools and Consumables are tentative any additional tools/consumables required to carry out the work effectively can be included.
<table>
<thead>
<tr>
<th></th>
<th>Safety valve repair &amp; testing</th>
<th>Need Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>services for Statutory compliance of IBR/hydrogen plant</td>
<td>Need Basis</td>
</tr>
<tr>
<td>13</td>
<td>Elevator (OEM/Competent party)</td>
<td>Quarterly and Need basis</td>
</tr>
<tr>
<td>14</td>
<td>Clean air/dirty air test</td>
<td>Quarterly and Need basis</td>
</tr>
</tbody>
</table>

**SCOPE OF WORK FOR ELECTRICAL MAINTENANCE – 4x300 MW**

BALCO 1200MW (4x300MW) is under construction, erection & commissioning. Each unit is having 300MW 20KV water & hydrogen cooled Generator with static excitation, AVR is of double Auto & double manual channel from ABB Unitrol-5000. 370MVA Generator Transformer stepping up 20KV generation voltage to 220KV, 35MVA 20/6.9KV Unit Transformer is tapped off from Generator Bus duct and carries the load of unit switchgear. Unit switchgear supplies 2X2MVA Unit Transformer, 2X1.25MVA ESP Transformer & One Lighting Transformer. 6.6 KV station (Common) switchgear connected through two numbers of station transformer each of 50MVA 220/6.9KV. Common 6.6KV Switchgear supplies 2X2MVA Chemical T/F, 4X2.5MVA common T/F, 2X0.63MVA Maintenance T/F, 2X0.63 CW system T/F, 2X1.6MVA AHP T/F, @X1.25MVA HCSID T/F. There are 8numbers of 72KV DC-800ma ESP rectifier transformers per unit. 6.6KV switchgear have Vacuum circuit Breaker & Fuses. Vacuum contactor, Each unit is having 30numbers of 6.6KV motors (excluding CHP & AHP) (5.8MW BFP is the highest capacity motor), 14numbers of 6.6KV compressor motors are installed for instrument and service air, good quantity of LT motors, 220KV switchyard with 18 Bays, 400KV GIS with three ICT of 315MVA 220/400KV to export power to 400KV Grid through double circuit.

**Areas to be covered under Electrical scope:**

<table>
<thead>
<tr>
<th>Area</th>
<th>Scope</th>
<th>Under the Main Plant equipments those coming under BTG, Transmission line , Switchyard, GIS, DM Plant, RWPH, CWP, CT, ESP, FOPS, Emergency system with DG, H2 Generation Plant, Control, Protection, Metering system &amp; Office. Scope Excludes electrical part involved in AHP &amp; CHP (AHP starts from ash vessel).</th>
</tr>
</thead>
<tbody>
<tr>
<td>400KV GIS &amp; ICT</td>
<td>Siemens make GIS connected with 220KV switchyard through 3X315MVA icts.</td>
<td></td>
</tr>
<tr>
<td>400KV Double Ckt TL</td>
<td>Length of 17KM, 50 No’s Towers with twin ACSS curlew conductors.</td>
<td></td>
</tr>
<tr>
<td>400KV Bays in Urga pooling station</td>
<td>2 No’s of 400KV Bays in URGA Pooling Station.</td>
<td></td>
</tr>
<tr>
<td>220KV Switchyard</td>
<td>Double bus with two sectionalized &amp; bus coupler for each section. Total 18 Bays.</td>
<td></td>
</tr>
<tr>
<td>Generator Transformer</td>
<td>370MVA, 235/20KV, OFAF, ynd11, One GT for Each Unit.</td>
<td></td>
</tr>
<tr>
<td>Component</td>
<td>Details</td>
<td></td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Generator</td>
<td>300MW, 20KV, Make: DFEM, Water cooled starter winding and Hydrogen Cooled stator core n rotor.</td>
<td></td>
</tr>
<tr>
<td>Unit Transformer</td>
<td>35/23-23MVA, 20/6.9-6.9KV, ONAF, Split winding transformer with OLTC, Tapped off from Generator bus duct. One UT per Unit. UT supplies two Different sections of 6.6KV unit switch board. Fast change over scheme is Implemented for C/O from Unit to station in auto as well as manual.</td>
<td></td>
</tr>
<tr>
<td>Station Transformer</td>
<td>There are two station transformers to meet the common load, 50/35-35MVA, 220/6.9KV-6.9KV, OFAF, Split winding transformer with OLTC</td>
<td></td>
</tr>
<tr>
<td>Excitation Transformer</td>
<td>4 MVA dry type</td>
<td></td>
</tr>
<tr>
<td>AVR</td>
<td>2Auto 2Manual Channel from ABB’s Unitrol5000</td>
<td></td>
</tr>
<tr>
<td>6.6KV Switchgear</td>
<td>Unit Supplies power to all pumps &amp; fans related to boiler &amp; turbine.</td>
<td></td>
</tr>
<tr>
<td>6.6KV Station Switchgear</td>
<td>Two different sections &amp; each having two connections, one each from the Secondary windings of the sets. Station to Unit tie has breakers at either end.</td>
<td></td>
</tr>
<tr>
<td>6.6KV HT Motors</td>
<td>6.6KV Motors above 1000KW fed from VCB and between 200KW to 1000KW By fuse vacuum contactor. Total 30 numbers of 6.6KV motors per unit. Total 14numbers of compressors to meet the air requirement of all four units.</td>
<td></td>
</tr>
<tr>
<td>6.6/0.415KV Dry type T/F</td>
<td>2X2MVA Unit TF/Unit, 2X1.25MVA ESP TF/Unit, 1X1.25Lighting TF/Unit, 2X2MVA DMP TF for all units, 2X2.5MVA common TF for two units, 1X0.63MVA maint TF for two units, 2X0.63MVA CW TF for all units.</td>
<td></td>
</tr>
<tr>
<td>415V pccs &amp; mccs and LT Motors</td>
<td>Acbs are provided for rating more than 400A. Mccbs are provided for &lt;=400A. Motors above 75KW fed from PCC &amp; &lt;=75KW are fed from mccs.</td>
<td></td>
</tr>
<tr>
<td>Emergency DG 415Volt</td>
<td>Three numbers of DG sets for complete station; DG1 for U1+U2 emergency load, DG2 for U3 &amp; U4 emergency loads and DG3 will be standby. Each rating is 1200KW.</td>
<td></td>
</tr>
<tr>
<td>UPS</td>
<td>Each unit has 2X80KVA UPS for main plant, UPS for NCCB, GIS</td>
<td></td>
</tr>
<tr>
<td>DCDB</td>
<td>Main Plant Unit DC system has two independent sections at 220V. Each unit will have 2X100% 1850Ah VRLA battery &amp; 2X100% floats cum boost charger. Each set has 110 batteries. Network control building DC system has two independent sections. Switchyard has 2X100% 300Ah VRLA battery. There are DC systems for coal handling and water system; each of 2X100% 200Ah VRLA battery with float cum boost charger.</td>
<td></td>
</tr>
<tr>
<td>ESCADA for Main Plant &amp; BOP, ESCADA for switchyard &amp; GIS.</td>
<td>Protections, Breaker status, feedback, controls, logics for Generator, Transformer, 6.6KV Swgr, 415V Swgr system, Emergency system are hooked to ESCADA. Switchyard system is hooked in another ESCADA. Siemens SCADA for GIS</td>
<td></td>
</tr>
<tr>
<td>Lighting/AC/Ventilation/ E CU</td>
<td>Crane, Hoist, Elevator, Lighting, Window/Split/Tower AC, HVAC, Ventilation AC, Chiller</td>
<td></td>
</tr>
<tr>
<td>ESP</td>
<td>Hybrid ESP has first two fields consisting of Rectifier Transformers and the rest three fields are of fabric bag filter type. Each unit has 8nos of 415V/72KV, 0.8Amp ESP TF.</td>
<td></td>
</tr>
<tr>
<td>GILMS</td>
<td>GILMS for the whole plant.</td>
<td></td>
</tr>
</tbody>
</table>

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
General Technical works:

1. All Routine, preventive, breakdowns, corrective maintenance.
2. Plan and carry out scheduled overhauling of all electrical equipments in the above said area depending on availability of systems/equipment without affecting normal operation of the plant.
3. Minor modification/ upgradation in the existing system including cable laying & related jobs shall be executed by Contractor as per requirement of BALCO EIC with existing manpower of Bidder & required material shall be provide by BALCO.
4. Periodicity of PM & routine jobs will be as per the standard practice as agreed by BALCO EIC.
5. Condition based monitoring for all electrical equipments as per prudent practice and schedule of BALCO.
6. Preparation of maintenance history for all types of maintenance in Hard As well as soft copy & monthly submission to BALCO EIC.
7. Maintaining Equipment History cards for all equipment.
8. Periodic updating of spare & consumables requirement as agreed with BALCO.
9. Provide reconciliation status of spares on monthly basis.
10. Responsible for security & up-keep of spares & consumable at local stores.
11. All kind of spare materials, equipment inside the plant which includes, receiving materials from central stores or directly from vendor and store the same in local stores or site as per instruction from BALCO EIC, and material shifting from site to central stores as required.
12. Necessary Maintenance Support from OEM to be arranged by BALCO as required.

Other Services:

1. Co-ordination with electrical inspector (CEA & CEIG) during the yearly electrical inspection & as and when required.
2. Implementing and sustenance of Quality activities like 5S, Quality circles etc.,
3. Preparation and maintenance of all ISO documents as per BALCO’s Requirements.
4. Regular Safety and technical trainings for all resources in the Electrical Team.
5. Testing and certifications of all elevators & hoist in the plant as per standards.
6. Necessary support for Periodic calibration (NABL accredited lab or agency approved by BALCO) of all electrical meters, testing kits, measuring equipments etc., as per standards both belonging to BALCO or contractor.
7. Annual Testing of all protection relays of Generator, Power transformer (above 4MVA), 220KV Switchyard equipment, and 400KV Switchyard equipment.
8. Testing of Generator, Power transformer (above 4MVA), 220KV Switchyard, 400KV Switchyard equipments as per Indian Standard / CBIP/ PGCIL standards, however frequency shall be every 1 year.
9. Liaisoning with local public, Forest department & other government department related to tree trimming & transmission line maintenance work and other service which came during the contract period.
10. Transformer oil filtration (filtration machine & Oil tank will be provide by BALCO). However Bidder to mobiles tank, machine & other works required to perform oil filtration. If vacuum pulling is required same shall be arrange by Bidder.
11. Painting of name in Electrical equipment for 5S work/ name identification work, BALCO shall provide paint, Bidder to arrange painter as per requirement.
12. Repairing works for Power Transformer (above 4MVA), LV Dry type Power transformer
6.6KV/433, Oil Cooled transformer – MV voltage level, 6.6KV Motors, 220KV Switchyard Equipments and 400KV Switchyard Equipments.

14. 6.6KV Cable & 20KV Cable – end termination & straight through termination work. Required expertise manpower and tools is under contractor scope.
15. Transmission line conductor – jointing & end clamps crimping work.
17. Arrangement of Hydra & trailer – on need basis - for shifting of spares from store, shifting of scrap to scrap yard, Transformer oil filtration work.
18. Housekeeping (weekly cleaning of panel room floor with soft broom, wet mop & cleaning of spider webs from wall in all electrical panel room.
20. In case of breakdown / failure of equipment – Bidder to remove equipment from working place to repairing & shifting of new equipment from store to working place include its transportation from store, to scrap yard, to repairing place. Also installation of equipment on its place, testing & commissioning of equipment.
21. Arrangement of portable Diesel Generator and other tools for transmission line tower maintenance work.

8. Detailed Scope of Work

2.2.1 400KV TRANSMISSION LINE:
Minimum weekly once patrolling of transmission line. CBM (Thermography minimum once in a week) and as per observations during patrolling; however the thermocam will be provided by BALCO, Routine, Preventive, Predictive and Corrective maintenance, cleaning of insulators, replacement of faulty/defective parts, tightness check, trimming of trees unto 10 meter of tower line periphery (on the basis of patrolling observation & as and when required) & liasoning related to it will be in contractor scope. Maintenance & troubleshooting of PLCC. Making of pathway for each tower. At present BALCO is connected with Grid through LILO connection on Korba-Birsingpur line and shortly BALCO will connect to URG&A pooling station through 22 KM transmission line.

(i) 400 KV SWITCH YARD:
Operation and maintenance of switchyard. Supervisor and technicians must come in shifts and shall be available round the clock. Shift parameters record, handling logbook, safety permit system and operation of switchyard as per the need to be handled. Preventive, Predictive, Breakdown maintenance of GIS, Line, Relay & Control Panel, SCADA system, Interconnectivity to 220KV through ICTs, Gas Leakage check/filling/dew point test of SF6 gas, system, Insulators, Duct, Circuit Breaker, Isolator. Repair, Replacement of equipments/parts/defectives along with shifting-lifting-Loading-Unloading of material. Thermograph, General Testing of equipments like CT, PT/CVT, LA, Cleaning, Tightness checking. Maintenance of ICT, oil filtration, reconditioning/replacement of silica gel. De-vegetation. Housekeeping up to 5 meter periphery of fencing and painting work.

8.2 220 KV SWITCH YARD
Operation and maintenance of switchyard. Supervisor and technicians must come in shifts and shall be available round the clock. Shift parameters record, handling logbook, safety permit system and operation
of switchyard as per the need to be handled. Preventive, scheduled predictive, Breakdown maintenance of switch gears and replacement of insulators/SF6 & air pressure check, refill/Megger values of the equipment/oil level in CT & PT/CVT/ICT/LA/Insulators/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, replacement of CT, PTS, Replace/Repair of any part of the above yard, replacement of clamps/jumpers/conductors. Thermography of OH line once in a month. Checking and maintenance of Fire fighting system. Prepare and maintenance of check list daily and maintenance done during the shutdowns. De-vegetation & chemical treatment will be in contractor scope. Testing of all switchyard equipment CT/CVT/Breaker/LA/Insulator once in a year.Houskeeping up to 5 meter periphery of switchyard fencing. Maintenance /repairing /painting/new installation of switchyard fencing.

(a) 220 KV TRANSFORMERS/ICT TRANSFORMER 220KV/400KV
Routine, preventive, predictive, Breakdown maintenance and testing of Power transformers, Cleaning, Checking, repair and replacement of gaskets/oil seals/fasteners/bushings/fans & pumps/LA/Insulators/radiators/valve /OLT/C/OLTC/oil level in conservator, oil top up, oil filtration /silica gel and breather/temperature controller/pressure relief diaphragm/testing of control and power connections/safety requirements, earth pits/NGR/Temperature measurements/meggering of earth pits/Checking and maintenance of Fire fighting system. Collection of sample and get the testing done for Transformer Oil as per IS1866 – Table 1 & 2 for transformer 1MVA & above from sampling valve or bottom valve at least - once in a year from standard testing lab (NABL accredited laboratory) will be carried by the contractor.

8.4 TRANSFORMERS
Routine, preventive, predictive, Breakdown maintenance and testing of Power transformers: Cleaning, Checking, repair and replacement of gaskets/oil seals/ fasteners/bushings/OLTC/oil level in conservator and bushings /silica gel and breather/testing of control & power circuits/meggering/ 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 (oil filtration machine will be provided by BALCO). Arresting oil leakages. Routine, preventive, predictive, Breakdown maintenance of Dry Type Transformers 6.6/0.415KV. Painting & shifting of Transformer, Bus-duct and Structure.

9. HT MOTORS
Preventive, routine, predictive, Breakdown maintenance of HT motors: Cleaning, Checking, minor repair and replacement of bushing, CT, Lug, end-termination kit, lubricating oil/bearings/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/and bearing temperature/Circuit Breaker operations/earth connections/ control and power cable laying/RTD/cooperation with Vibration measurement team, Cleaning of water cooler, air cooler. Overhauling of HT motors as per pre-decided frequency and as per CBM demand. CBM of Motors (Vibration Analysis will be excluded from the contractor scope as is a part of mechanical scope). CSA of motors will be done by the contractor, however the instrument for CSA and the SOP to use will be provided by BALCO. HT motor rewinding, re-insulation will be in BALCO scope; however shifting, loading painting and unloading
inside plant will be in contractor scope.

(a) **LT MOTORS**
Preventive, routine, predictive, Breakdown & overhauling maintenance of LT motors: Cleaning, Checking, repair and replacement of lubricating oil or grease/bearings/ fasteners/ terminal connection/control and power circuits/tightness of power cable terminations/insulation/winding resistance and inductance/interlock and trip contacts/cooling system and ribs /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. Overhauling of LT motors will be done on the basis of CBM report and overhauling of all the critical motors and DC motors in unit overhauling. Rewinding of LT motors, loading, unloading, gate pass formalities will be taken care by the contractor.

(a) **DC MOTORS**
Preventive, Scheduled, predictive, Breakdown & overhauling maintenance of DC motors. Cleaning, Checking, repair and replacement of carbon brushes holders’ air filter. IR value load and no load trials, repair/replacements of motors, machining work for rotor shaft-housing-end covers. DC panel power & control checking, clamping, repair and replacement of components. Rewinding of DC motors, loading, unloading, gate pass formalities will be taken care by the contractor. All DC motors will be overhauled in unit overhauling.

1 **SWITCHGEAR PANELS AND LOCAL CONTROL PANELS**
Preventive, routine, predictive, breakdown & overhauling maintenance of all switch gear panels and Low voltage panels. 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/ /transducers/ammeters/energy meters/relays/CT/PT/ control transformer/earthing connections/control and power cable laying & jointing/safety requirements/bus duct, Laying/Removing of Power and control cables as and when any modification, safety, maintenance requirement jobs are being done. During unit overhauling all HT switchgear, LT PCC & MCC busbar tightness, control circuit tightness, cleaning, maintenance of HT & LT breakers/vacuum contactors.

2.2.10 **CRANES & ELEVATORS**
Preventive, routine, predictive and breakdown maintenance of EOT, Monorail, Hoists & Elevators in Boiler, Main Power House & in Chimneys: 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/Maintenance, repairing, alignment of Railing Bus bar/ replacement of carbon brush/ 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. Testing and certification of all EOT crane.

2.2.11 **PROTECTION SYSTEM**
Cleaning, checking testing and field simulation of all the relay and protective panels of 400KV, 220 KV, 6.6 KV systems and 0.4 KV 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 all Energy meters
TENDER DOCUMENT FOR
OPERATION & MAINTENANCE OF POWER PLANTS

installed as per PGCIL guidelines. BALCO will bear the actual cost incurred in testing and calibration of equipments/instruments. Routine checking cleaning and testing of GILMS system installed at 1200MW premises.

2.2.12 ESCADA, CILMS, NCCS
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. Checking and Cleaning of ESCADA/CILMS/ NCCS panels, continuity/tightness checking of termination/feedback checking/software uploading/data transfer/communication.

2.2.13 UPS, DCDB, ACDB, BATTERY AND INVERTER
Periodical maintenance of Battery, Charger, UPS and Inverter, Cleaning, checking of specific gravity/level of distilled water/individual battery voltages/Battery Load test/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. Battery Discharging & Charging test to done all Battery Bank sets once in a year.

2.2.14 ESP
Periodical cleaning and checking of all the HV and LV panels/rectifier transformers/Oil testing/compressors/tightness of control and power circuits/Rapping system/relays and contactors/insulator, porcelain and hopper heaters/interlocks/Micro computer controller and settings/insulation of fields/earthing/operation of ACB and contactors. Replacement shifting and testing work of transformer.

2.2.15 CHIMNEY LIGHTING, PLANT & OFFICE LIGHTING & EXHAUST FANS
Periodical replacement of fused bulbs, chokes, ballasts, starters, battery of entire lighting system includes Chimney Aviation Lighting system. Cleaning and checking of fixtures/tightness of control circuits/photo lighting system/sockets,
LDDB/SLDB/Testing of ELCB and other portable equipment’s regularly. Repair, replacement, rewinding of plant & office Exhaust fans (entire power plant area including Coal yard, street light, Boundary wall, security gate, raw water pump house, chimney, towers, offices, security office in 1200MW Plant, Gate lighting work). Plant area, buildings, 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 contractor.

2.2.16 AIR CONDITIONERS, WATER COOLERS AND PURIFIERS
Preventive, Predictive and Routine Maintenance of HVAC System including window type, split type, tower AC and Centralized air conditioners, HVAC, water coolers and purifiers, Cleaning, checking, repair and replacement of air filters/fans, replacement of electrical and electronic component, repairing & replacement of compressor in the scope of contactor. Spares, compressor and Gas for AC will be provided by BALCO.

1. GENERATOR AND EXCITATION SYSTEM + 20KV IPB+ 6.9KV SPB+ 20KV LA& PT
Cubicle+ High Pressure system for 20KV IPB:
Preventive, predictive and routine maintenance of Generator, Generator Bushing, NGT, Generator bus duct, dehumidifier, LAPT, CT and Excitation system including troubleshooting, cleaning, checking, testing, repair and replacement of carbon brushes/holders/exciter/lubrication of bearings/winding and
bearing temperatures/meggering/exciter connections/earthing. Cleaning, checking, repair and replacement of control fuses in the excitation and AVR panels/contactors/control transformers and exciter transformers.

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

2.2.19  **LAB EQUIPMENTS, MAINTENANCE BOARDS, MANUALS AND DRAWINGS**
Routine, Preventive maintenance of lab instruments, 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. One set of manual and drawings to be handed over to the contractor; contractor has to convert it to multiset for day to day use.

2.2.20  **DIESEL GENERATORS**
Preventive, predictive, routine and Breakdown maintenance of DG and Diesel engine, 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.

10.  **LIFTING TOOLS & TACKLES**
Testing Certificate and annual testing of all lifting tools & tackles

2.2.22  **TESTING AND CALIBRATION**
Testing certificate of all lifting tools and tackles will be submitted as and when required from contractor. Calibration of all master testing/measuring instruments provided by BALCO will be under BALCO’s scope. Calibration of all master testing/measuring instruments provided by Contractor will be under Contractor’s scope. Annual testing of relays/breakers, calibration of measuring & testing equipments as per standard to be carried by the contractor

2.2.23  **SHUTDOWN JOB and OVERHAULING:**
Contractor will carry out shut down jobs and overhauling job (other than special overhauling jobs; such as Annual Testing of equipments where test kits are not available with BALCO like Generator Testing & Generator Major Overhauling, GIS major overhauling which will be in BALCO scope) for the unit. Contractor will carry out Cleaning & Tightness of all equipments, HT motor overhauling once in a year, LT motor Overhauling for all critical & emergency motors & DC motors, battery Charge & Discharge test, breaker testing, relay testing. Additional manpower for short term during shutdown and during overhauling to be taken by the contractor to meet the quality and timely completion of job. Contractor has arrange the required addition manpower during and overhauling and any major breakdown job.

2.2.24  **SHIFTING/LOADING/UNLOADING**
Shifting, Loading, Unloading of materials, motors, spare parts from store to workplace, work place to store, central store to local store, local store to central store, inside the plant movement like movement between plant to BALCO workshop and within BALCO premises with arrangement of hydra and suitable vehicle in contractor scope.

2.2.25  **EARTHING, LIGHTING PROTECTION, CABLE TRAY & CABLE GALLERY:**
Maintenance of plan earthing system, lightening protection equipment, repairing and new installation of cable tray.

2.2.26 **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 the 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

2.2.27 **SAFETY/HIHE/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. Contractor has to maintain the BALCO safety norms and achieve the required level as per EIC in charge.

2.2.28 **SCHEDULED MAINTENANCE /TESTING JOB:**

Contractor has to arrange manpower and resource in order to perform the following equipment testing as per EIC in charge. Payment will be done on the basis of executed job. The detailed scope and equipment will be as:

**Diagnostic testing of 400KV 220KV, 20KV, 6.6KV switchyard equipment’s and Generator of 1200MW Equipment (Annexure-1) cover the following test:** Diagnostic tests of 400KV, 220KV, 20KV, 6.6KV Equipment as per the scope defined below to be carried out minimum once in a year/as &when required as per the situation of the equipment’s. Diagnostic tests proposed for the various switchyard equipment’s are given below. The diagnostic testing will be done as per mutually agreed schedule / or as and when required.

**CIRCUIT BREAKERS:**
- **Timing test:**
  - a. Close time
  - b. Trip time
  - c. C-O time
- **Contact resistance test:**
- **Pole discrepancy test**
- **Insulation resistance**

**POWER TRANSFORMERS**
- **C and Tan Delta test:** To detect insulation condition
- **Recovery Voltage measurement:** To detect polar impurities in insulation condition
- **Sweep Frequency Response analysis:** To detect any winding movement.
- **Winding resistance measurement:** To check winding condition.
- **Magnetic balance test:** To check core condition
- **Magnetizing current test:** To check core condition.
- **Turns ratio measurement:** To check inter turn fault

**CURRENT TRANSFORMERS**
C and Tan Delta test: To check insulation condition
Checking of Secondary Terminal box: To check oil leakage, terminal connections.
Insulation resistance measurement on primary and secondary insulation.

**CVT**

C and Tan Delta test: To check insulation condition of all stacks.
Checking of Secondary Terminal box: To check oil leakage, terminal connections.
Ratio Test: To check the proper induced secondary voltage

**ISOLATORS**

Contact Resistance / Milivolt: To check contact alignment, resistance
Measurement: and pressure
Checking of alignment: To check ON/OFF operations
Checking of marshaling box: checking of interlocks

**SURGE ARRESTER**

On line Measurement of Third harmonic Resistive leakage current: To check the condition of metal oxide blocks minimum once in a year or as required. The contract agency must have the testing equipment of duly calibrated good make (acceptable to Balco) or hire the services from famous testing house like ERDA, VOLTTECH, and SHAN etc.

This is online test and can be done only when switchyard is in charged condition.

**Generator 20KV ,300MW**

Contractor has performed the complete LIFE EXPANGENCY PROGRAM ANALYSYS of 300MW Generator unit during the overhauling or any breakdown or as per EIC in charge instruction. The minimum testing has to perform under this are:

- VISUAL INSPECTION (Contamination, Insulation Resistance, Core Condition, Stress Grad Condition, Wedge Condition, Main Rotor & Stator)
- TESTING OF STATOR AND ROTOR
- POLARISATION-DEPOLARISATION CURRENT ANALYSIS (PDCA)
- TAN DELTA AND CAPACITANCE ANALYSIS (TDCA)
- NON-LINEAR INSULATION BEHAVIOUR ANALYSIS (NLIBA)
- PARTIAL DISCHARGE ANALYSIS
- COUPLING RESISTANCE
- DIGITAL ELCID TEST
- STRESS CALCULATIONS AND REMAINING LIFE ESTIMATION
- RECURRENT SURGE OSCILLOGRAPH
- TEST ON EXCITER
- RECOMDATION AND ANALYSIS.

**RELAY TESTING**

The relay testing of 1200MW plant cover the complete testing of 400KV, 220KV, 20KV 6.6KV System related protection system.
Contract Agency has to arrange necessary Test Bench / Kit for testing of all the relays falling under Battery Limit at site as per mutually agreed schedule or as and when required.

Contract Agency has to arrange expert for Relay testing specially for Areva, Alstom, SIEMENS & other relays installed in Transmission Lines and Generator, stations, stations etc. once in a year or as & when required within battery limit.

Contract agency has to submit the test report of individual equipments mentioned in the Annexure-2 above within 2 days from the date of testing & within 1 month from the date of testing with expert recommendation & at the end of the year in the compiled from area & equipment wise.

List of equipment and Quantity for Testing on scheduled basis:

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Equipment</th>
<th>UOM</th>
<th>Installed Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Complete Testing of 400KV CT,2000-1000/1A</td>
<td>NO</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>Complete Testing of 400KV CVT,400000/V3</td>
<td>NO</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>Complete Testing of 390KV LA</td>
<td>NO</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>Complete Testing of 220KV LA</td>
<td>NO</td>
<td>54</td>
</tr>
<tr>
<td>5</td>
<td>Complete Testing of 220KV CT</td>
<td>NO</td>
<td>63</td>
</tr>
<tr>
<td>6</td>
<td>Complete Testing of 220KV CVT</td>
<td>NO</td>
<td>29</td>
</tr>
<tr>
<td>7</td>
<td>Complete Testing of 400/220KV ICT,315MVA</td>
<td>NO</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>Complete Testing of GT Transformer 370MVA 20/235KV,YN,D11,</td>
<td>NO</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>Complete Testing of ST Transformer 50/35-35 MVA,YN,yn0-yn0,220/6.6KV</td>
<td>NO</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>Complete Testing of UT Transformer 35/23-23 MVA,YN,yn0-yn0,20/6.6KV</td>
<td>NO</td>
<td>4</td>
</tr>
<tr>
<td>11</td>
<td>Complete Testing of Excitation Transformer,4MVA,20/0.9KV</td>
<td>NO</td>
<td>4</td>
</tr>
<tr>
<td>12</td>
<td>Complete Testing of 220KV SF6 Circuit Breaker</td>
<td>NO</td>
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<td>13</td>
<td>Complete Testing of Generator 20KV, 300MW</td>
<td>NO</td>
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<tr>
<td>14</td>
<td>Complete testing Generator Unit Protection System</td>
<td>AU</td>
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</tr>
<tr>
<td>15</td>
<td>Complete Testing of 220KV Switchyard Bay Protection System</td>
<td>AU</td>
<td>18</td>
</tr>
<tr>
<td>16</td>
<td>Complete Testing of 400KV GIS Bay Protection System</td>
<td>AU</td>
<td>6</td>
</tr>
</tbody>
</table>

2.3 **CONTRACTOR ELECTRICAL SCOPE:**

- Providing necessary manpower, extension board with cable & top, halogen, hand lamp, tools and tackles for overhauling of motors, transformers and generators and auxiliaries as and when required and when experts come from outside.

- **TOOLS & TACKLES:** The contractor shall keep necessary tools, tackles, measuring instruments for day to day activities. Contractor shall keep Megger (3numbers HT & 5numbers LT), 8 good quality Multi meters for all area and each master technician shall have separate multi meter in their tool bag, Tong tester (5AC and 3 DC), 1 Earth Megger etc. for routing, preventive and breakdown maintenance. All technicians must be provided with tool kit and multi meter. Welding machine, cutter, all types of Fibre Glass ladder for work at height mainly light/ street light maintenance, Hydra, Chain block, pulley, rope, trolley required for shifting of equipments/motors/spares/damaged parts within the plant premises/ workshop, Telescopic Rod.
Earth Rod.

- **CONSUMABLES:** For regular maintenance work consumables like silicon sealant, putty, lugs up to 25 sqmm cu & al, hex blade, nut bolts, 1.5v-9v battery, 100w bulb, bulb holder, hand lamp frame holder, extension board with cable, petroleum jelly, battery clamp, distilled water, capacitors for AC/Fan, emery roll, sand paper, electronic component cleaner, necessary Insulation tape (PVC/Para/Empire/Fibre-glass/Glass mica/Cotton), polythene, tarpaulins, cotton waste, Petrol, Kerosene, Diesel, CRC-226, Rustolene, CTC, soldering iron, test board, 24 V hand lamps with transformer and all cleaning elements will be under Contractor’s 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, 33KV), helmet, earplug, safety shoe, fuse Pullers, Torch light and insulated tools etc.,
- Supervisor, electricians shall be arranged in three shifts along with one group in general shift.
- 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.
- **CEA & 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 indigenization 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 BALCO engineers daily.
- Filled logbook duly signed by the supervisor should be submitted to BALCO engineers daily. However the completed log book should be handed over to BALCO 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 (B & C), 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 and CEIG requirement. Filing of history cards in regular basis.

**Contractor Scope/OEM services/ Expert Services**

<table>
<thead>
<tr>
<th>SN</th>
<th>Description</th>
<th>Vendor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ECI Maintenance</td>
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</tr>
<tr>
<td>2</td>
<td>High Mast Repairing</td>
<td>In the scope of the contractor</td>
</tr>
<tr>
<td>3</td>
<td>Nomenclature Painting work</td>
<td>In the scope of the contractor</td>
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</table>

**TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS**
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Scope of Contractor/OEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>LV DG Expert Service for 1200MW</td>
<td>In the scope of the contractor/OEM-Garuda Power</td>
</tr>
<tr>
<td>5</td>
<td>Repairing of VFD</td>
<td>In the scope of the contractor/OEM-ABB</td>
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<tr>
<td>6</td>
<td>AMC of Elevator</td>
<td>In the scope of the contractor/OEM-Thyssenkrupp</td>
</tr>
<tr>
<td>7</td>
<td>AMC of UPS</td>
<td>In the scope of the contractor/OEM-Donvey</td>
</tr>
<tr>
<td>8</td>
<td>AMC For AVR</td>
<td>In the scope of the contractor/OEM-ABB</td>
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<td>9</td>
<td>AMC for VFD</td>
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<tr>
<td>10</td>
<td>AMC for Relay Repairing</td>
<td>In the scope of the contractor/OEM-Schneider</td>
</tr>
<tr>
<td>11</td>
<td>AMC for Relay Testing</td>
<td>In the scope of the contractor/3rd Party</td>
</tr>
<tr>
<td>12</td>
<td>AMC for Transformer Testing</td>
<td>In the scope of the contractor/3rd Party</td>
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<td>AMC for Generator Testing</td>
<td>In the scope of the contractor/3rd Party</td>
</tr>
<tr>
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<td>AMC for Generator OH</td>
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</tr>
<tr>
<td>15</td>
<td>AMC for LT Motor Repairing</td>
<td>In the scope of the contractor/3rd Party</td>
</tr>
<tr>
<td>16</td>
<td>AMC for Energy Meter Calibration</td>
<td>In the scope of the contractor/3rd Party</td>
</tr>
<tr>
<td>17</td>
<td>AMC for DGA &amp; Furan Gas analysis</td>
<td>In the scope of the contractor/3rd Party</td>
</tr>
<tr>
<td>18</td>
<td>AMC for HT Cable laying &amp; Cable jointing work</td>
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</tr>
<tr>
<td>19</td>
<td>AMC for GIS &amp; Expert Services</td>
<td>In the scope of the contractor/OEM-SIEMENS</td>
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<td>AMC of Plant Hoists</td>
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</tr>
<tr>
<td>21</td>
<td>AMC for Transmission Line</td>
<td>In the scope of the contractor</td>
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</tbody>
</table>

**List of Tools & Tackles**

Minimum Tools maintained by the contractor are as provided below (but not limited to). Before mobilising all tools & tackles contractor is required to submit list of tools & tackles with make & model number for approval of BALCO.

1. Double end spanner all size - 1 set for 1 technician + Additional 2 Set
2. Ring spanners all size - 1 set for 1 technician + Additional 2 Set
3. Screw Drivers all size (Insulated type for electrical works) - 1 set for 1 technician + Additional 2 Set
4. Hacksaw frame and blade - 10 Nos.
5. Allen keys - 1 set for 1 technician + Additional 2 Set
6. Wire stripper - 1 set for 1 technician + Additional 2 Set
7. Cable Crimping tools - 10 Set + 2 Set of hydraulic Crimping tools up to 1000Sqmm.
8. Tools for Cable end termination & Straight through termination.
10. Hammer - 10 Nos
11. Screw Spanners 4 to 12" - 6 set
12. Files (flat & round) - 10 set
13. Cutting Pliers - 1 set for 1 technician + Additional 2 Set
14. Nose Pliers - 1 set for 1 technician + Additional 2 Set
15. Circlip Pliers (inner & Outer) - 10 Nos.
16. Paint Brush - 10 Nos.
17. Torch Light with rechargeable battery - 6 Nos.
18. Chain Block - 5 Nos. 10ons
19. Rope - Depends on job requirement such as EHV tower maintenance, Switchyard maintenance & other electrical maintenance work
20. Digital Millimeters - 1 set for 1 technician +Additional 2 Set(Only Fluke Make)
21. Tongue tester - 5 Nos AC and 3 No’s DC with milliamps range & amps range.
22. Digital Insulation Resistance Measuring Instrument (Megger) - 3numbers HT & 5 numbers LT of renowned make (Fluke/Megger)
24. Infrared temperature gun – 1 number.
25. Phase Sequence Meter – 1 number.
26. Lux meter – 1 number.
27. Tachometer -1 number.
28. Motor Checker – 1 number.
29. Tester - 1 set for 1 technician + Additional 2 Set
30. Ferrule & tag printer with all types of consumables: 2 sets
31. Label printer (along with inks and paper) for printing of label for lighting DB, Local Operation box, Push button station, Documentation purpose etc.,
32. All types of Torque wrench: 2 Sets.
33. Tube Bender-1 set all size.
34. Wielding, Grinding and cutting Set: 2 Sets
35. Electrical Operated Torque wrench: 2 sets up to all size.
36. Air gun
37. Vacuum cleaner, blower & hot blower: 2 set big size (each)
38. Extension board: as per site requirement.
39. Tools bag/box 1 set for each technician.
40. Discharging Rod for earthing purposes for maintenance / safety of person working in 415V panel, 6.6KV panel, EHV Switchyard & EHV Transmission line.
41. FRP ladders of different height & different type for maintenance work in EHV Switchyard, Lighting maintenance, Hoist Maintenance/any maintenance at height.
42. Grease Gun for lubrication of Motor (415V & 6.6KV)
43. Fuse Puller
44. Full body safety harness with double lanyard for height work - as per job requirement.
45. Discharge rod suitable for 400kV – 12 nos
46. Life line/vertical fall arrester rope - 2 Nos (minimum 60 mtrs)
47. Vertical fall arrester – 8 Nos
48. 12 mm to 16 mm PP rope – as per site requirement.
49. 8 mm to 16 mm steel rope/sling – as per site requirement.
50. 4.5 MT to 12 MT D-shackle - as per site requirement.
51. Single/double sheaves rope pulley (Open/close type) – as per site requirement.
The Following Tools 7 tackles shall be mobilise as & when required for schedule job work
52. Man basket/jhula for spacer fixing – 2 Nos.
53. Portable hydraulics press machine – 2 Nos along with 2 sets of die for Moose, Zebra, Tarantula and earth wire. SAG board/plate – 6 nos. (as & when required for schedule job work)
54. Aerial roller for conductor – 30 Nos.
55. Electrically insulated platina rope – 1000 mtr.
56. Lifty with four sheave pulley – 6 sets.
57. Come-along clamp for conductor (Moose, Zebra and Tarantula) – 12 Nos for zebra, 24 Nos for moose and tarantula
58. Come-along clamp for earth wire – 4 Nos

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
59. 3 sheave suspended roller for conductor – 12 Nos.
60. Single sheave suspended roller for conductor – 6 Nos.
61. Single sheave suspended roller for earth wire – 8 Nos.
62. Socks with eye for conductor pulling
63. Ground roller – 20 Nos.
64. Portable hydraulic cutter – 2 Nos.
65. Safety clamp – 6 Nos.
67. Turn table for drum – 2 Nos.
68. Vertical drum lifting jack - 2 Nos.
69. Cushioned open/close pulley suitable for laying OPGW/ADSS cable – As per site requirement.
70. Armour grip and chain pulley block for OPGW/ADSS cable – 2 sets.
71. Cushioned suspended rollers suitable for OPGW/ADSS cable – As per site requirement.
72. OTDR suitable for locating fault in OPGW/ADSS cable.
73. 3 cylinder type tractor – 2 Nos.
74. 12 MT, tripple boom Hydra – 1 No.

List of Consumables
19. Contact cleaners all type (CRC, NON CRC etc.)
20. Lubricants + Paints
21. Copper tube/flexible tube only for lab purpose
22. Glass Fuse + Terminal Blocks
23. Ferrule/Tag printing consumables.
24. Teflon Tapes + Insulation tapes.
25. Gaskets for valves/flow meters/etc and O- rings
26. Pipe fittings /connectors /ferrules / screws/bolts/nuts etc
27. Buffer solution for PH calibration
28. Lugs up to 25 sqmm all type (Cu &Al) & cable ties
29. Safety gloves/goggle /masks/ear plugs/cleaning cloth etc
30. Calibration gases for analyzers.
31. Batteries for instruments.
32. Cotton waste/marketing cloth
33. Ambry paper all type.
34. Yellow/black strip for 5s
35. Flexible copper cable multistrand single core for looping, panel wire, extension board etc. up to 4 sqmm.
36. Hydraulic oil for dead weight tester.
37. Silicon Sealant.
38. Putty
39. Hex blade
40. Nuts & Bolts
41. Extension Board with Cable
42. Switch, Socket & its Boards

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
43. Petroleum Jelly  
44. 100W Bulb, its holder  
45. Battery Clamps  
46. Distilled water  
47. Petrol/Diesel/ Spirit for cleaning purpose.  
49. Miscellaneous spares items of Air conditioner cost not more than 3000/-Rs  
50. Emery roll, sand paper.  
51. Electronic component cleaner.  
52. Insulation tape (PVC/Para/Empire/Fibreglass/Glassmica/ cotton) for 415V, 11KV & 32KV voltage level.  
53. Polythene, Taurpaulin, Cotton waster.  
54. 24V Hand lamps with transformer.  
55. Soldering iron  
56. Test Board  
57. All Consumable/ Miscellaneous items not mention above (but its unit price is less than 3000/-Rs), however required for maintenance work shall be in Contractor Scope.

**SCOPE OF WORK FOR INSTRUMENTATION MAINTENANCE – 4x300 MW**

The Scope of Work under this proposal covers C & I assets of PP-1200 (4 X 300 MW Power Plant) at B ALCO, Korba (excluding AHP/CHP).

<table>
<thead>
<tr>
<th>SCOPE</th>
<th>Description</th>
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<tr>
<td>E/C&amp;I</td>
<td>Annual Maintenance Contract for Foxboro IA DCS</td>
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<tr>
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<td>3&lt;sup&gt;rd&lt;/sup&gt; Party Maintenance as listed</td>
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<tr>
<td></td>
<td>Field Instruments Maintenance</td>
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</tbody>
</table>

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
C&I Maintenance
BALCO 1200MW (4X300MW) is ready for production. The units are associated with FOXBRO DCS, Field instruments for Boiler-Turbine-Generator and their auxiliary systems.

DCS SYSTEM:
- The DCS shall cover the entire Control / Monitoring of the plant such as Boiler Integral controls including Boiler Protection, Turbine Integral Controls including Turbine Protection, Balance of Plant controls including Feed & Condensate water, Auxiliary steam, Cooling water etc., Boiler protection shall comply to NFPA requirements.
- DCS shall have suitable, proven serial OPC links to Utility plant PLCs (of Ash Handling, Water treatment) for operation and monitoring. The controls of these plants shall be implemented in respective redundant PLCs. Each utility PLC shall be supported by one PC based station for operating / engineering during startup. Normal operation will be from control room.
- Utility plants like LDO handling and Effluent collection and forwarding system shall be operated from respective Local control panels / Boxes. For ACV plant hardwired status monitoring shall be provided in DCS.
- MODBUS LINKS shall also be provided for Turbovisory equipment.
- Protocol interface for common Management Information System (MIS). (MIS in Owner’s Scope)
- Control room / equipment room panels and racks.
- All primary sensors like flow elements, temperature sensors, etc.
- All field instruments – process switches, transmitters, local gauges, etc.
- All final control elements like control valves, de-super heaters and actuators.
- All gas analyzers and emission monitoring instruments.
- All Machinery monitoring instruments, vibration monitoring and temperature
measurements.
- All boiler integral instrumentation including secondary air damper control system, Burner Management System (BMS), Soot blower control system, etc.
- All turbine integral controls & instrumentation like turbine supervisory instruments, Automatic Turbine Run Up System (ATRS), Electro-hydraulic Governor Control (EHG), provision for manual testing of ESV & Over speed Governor, Turbine Protection System, etc.
- All junction boxes, cubicles, enclosures, local panels, pneumatic and process hook up hardwires cables and other erection materials and accessories.
- Master and slave clock system.
- Maintenance and calibration equipment.
- Complete control monitoring and protection system of all auxiliary systems and offsite facilities like Coal Handling Plant, Ash Handling Plant, Water Treatment plant, etc., with facility to interface with main DCS.
- Sequence of event recording and annunciation system as a part of DCS.
- 6.6 kV and 415 V auxiliary power system and equipment / plant status monitoring in DCS.
- Operation & control of circuit breakers requiring synchronizing from DCS in auto mode.

Areas to be covered under Contractor’s Instrumentation scope:
C&I Maintenance contract includes DCS, PLC, Field equipments, Control & Supervisory units for BTG. Area of scope will be Main plant & BOP ,AHP & CHP including DM Plant, CWPH, RWPH, FOPS, ESP, Bag filter, SWAS, Flue Gas System, Soot Blower System, Coal Feeder, vfds associated with C&I system, Control Valves, Motorized Valve, Integrated Valves and modules associated, Compressor, Emergency DG, Main plant means BTG along with associated auxiliaries, Cooling Tower, DM Plant, RWPH, FOPS, Fire Fighting System, PA system (DADX/EPABX), Smoke Detectors, Truck tripper.
Maintenance, Software handling of DCS, Minor Logic modification, Minor Logic Development as and when required & incorporates in DCS, PLC for the existing I/O’s.
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.

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

- Overhauling of all the Control and instrumentation equipment in the entire power plant, replacing the damaged items with the spares.
- 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.
- Spares like washers, small screws, bolts and nuts etc. will be in Contractor’s scope and should be replaced as and when required.
- 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.
- 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.

- 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.
- 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.
- Any maintenance/repair jobs in DCS and PLCs’ will be in Contractor scope.
- Contractor using the laboratory/laboratory equipment provided by the Company 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’s scope.
- 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.
- All maintenance/repair/overhauling etc. for the pneumatic/motorized/hydraulic actuators.
- 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.
- 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.
- Maintenance, minor repair works, cleaning of computers, printers, mouse etc. involved in plant automation.
- Painting of damaged, dismantled, and rusted portions etc. in field instrumentation and panels.
- Applying lubricant, cleaning filters, removing chokes in the impulse line, filters, plugging leaks etc.
- Attending Trouble shooting and other emergency time/jobs.
- 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.
- Checking of cables and terminations, Laying and connecting of cables as and when required
- 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.
- 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.
- All consumables including brass fittings, non-metallic & metallic tubes shall be under Contractor’s scope.
- The removing, replacement, shifting of field and panel instruments and motorized valves actuator, control valves actuator as per advice of Company engineers shall be in Contractor’s scope.
- Maintenance of lab instruments, provided by Company & of its own.
- Calibration of Master calibrating instrument by recognized and authorized external agency.
- Passivation and preservation of removed instrument A/C storage place to keep Electronic Cards shall be provided by BALCO.
- Co-ordination with OEM for specialized activities on Company’s instruction.
- Tools as per Company’s instruction.
- Tagging of instruments and cables for Faulty & damaged one.
- Instrument network maintenance including fiber optic splicing.
- Communication tools such as laptop, cables will be Company’s scope however relevant software will be BALCO scope
- Forcing and protection bypass, logic and graphic changes are not allowed without owners’ written permission.
- Access to engineering stations will be restricted to previous approval from Company.
- Requirements related to boiler inspector and environmental auditors to be fulfilled by Company
- Material movement from store to site and site to store.
- Managing of local store for critical spares.
- Site cleaning after maintenance activity.

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
• Co-ordination for AMC activities with OEM/Expert agencies for critical equipments where criticality of equipment is more and it needs expertise.

• Consumable 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 the approval of owner.

• 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.

• Earth Pit maintenance will be in contractor scope including the consumables and painting will be in its scope.

• Chemical laboratory instrument/analyser calibration/maintenance and upkeep will be in contractor’s scope.

• One RSO to be deputed at site for nucleonic density meter maintenance.

• CCTV Maintenance- Maintenance and Up keeping of CCTV camera system.

• Break Down failure & Root Cause Analysis Report: For any type of breakdown contractor must be submit a failure analysis report within 24 hours with proper justification and implementation of CAPA for the same.

• Safety & 5S: Contractor Participation must be 100% in 5S, Quality circles & plant safety related activities like HI/HE etc. throughout the year. All employees must be wearing proper PPE as per requirement.

**General Technical works:**

1. All daily, Routine and corrective maintenance
2. Preventive maintenance
3. Repair of Instruments
4. Shutdown and breakdown maintenance
5. Condition based monitoring
6. Minor modification / up gradation in the existing system including cable laying, cable dressing, cable termination circuit modification, logic modification/cards addition or removal in any DCS/PLC & related jobs has to be executed by contractor as per requirement of BALCO EIC. However, cable laying & dressing done in excess of predefined limit will be covered under category of Payable Scheduled Jobs. Quantum of work will be certified by BALCO EIC prior and after job completion and EIC decision will be final.
7. Periodicity of PM & routine jobs will be as per the standard practice as agreed by BALCO EIC.
8. Preparation of maintenance history for all types of maintenance in Hard As well as soft copy & monthly submission to BALCO EIC.
9. All modification jobs are to be entered in to the master drawings and modified part drawing must be pasted on the respective panel. All modifications carried
to be incorporated in the existing drawings. Any drawing development of spares/equipment is in Contractor’s scope.

10. Monthly up-date of spare & consumables requirement.
11. Provide reconciliation status of spares & consumables issued by BALCO on monthly basis.
12. Responsible for security, up-keep and periodic updating of Lab equipments, spares & consumable stock at local stores. Necessary support to lab master instruments calibration party arranged by BALCO.
13. All kind of spare materials, equipments inside the plant which includes, receiving materials from central stores or directly from vendor and store the same in local stores or site as per instruction from BALCO EIC, and material shifting from site to central stores and vice versa as required. O&M contractor has to maintain vehicle for the same.
15. Any machining job, arising in course of repair, is in Contractor scope.
16. Contractor shall position an expert manpower for Laboratory works, calibration, welding and fitting processes.
17. Contractor has to extend manpower and tools support during modification job initiated by owner. Owner will consider if any job suffers due to lack of manpower during such period.
18. Contractor has to ensure data history of DCS ,PLC.

**AMC Clause & Co-ordination with OEM:**

Contractor shall have AMC with OEM to ensure support of the below mentioned instruments/equipment. SOW of AMC will be as per BALCO.

<table>
<thead>
<tr>
<th>AMC</th>
<th>1200MW</th>
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<tbody>
<tr>
<td>Foxboro DCS AMC</td>
<td>Quarterly and Emergency</td>
</tr>
<tr>
<td>AB PLC AMC</td>
<td>Quarterly and Emergency</td>
</tr>
<tr>
<td>CEMS/ Opacity AMC (forbes Marshall)</td>
<td>Bi Monthly</td>
</tr>
<tr>
<td>DG ( man-days) (cummins)</td>
<td>24 Days</td>
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<tr>
<td>Fire Alarm System (GE- Advert)</td>
<td>Quarterly</td>
</tr>
<tr>
<td>Weigh Bridge ( Digital)</td>
<td>Full Time</td>
</tr>
<tr>
<td>Analysers (O2, CO, Ph, Sodium, SWAS, Conductivity, Silica etc)</td>
<td>Quarterly</td>
</tr>
<tr>
<td>Belt Scale Calibration ( External)</td>
<td>Quarterly</td>
</tr>
<tr>
<td>GE Bentley Services</td>
<td>As per Requirement</td>
</tr>
<tr>
<td>Master Instrument Calibration</td>
<td>Yearly</td>
</tr>
<tr>
<td>DCS Asset AMC</td>
<td>Quarterly</td>
</tr>
<tr>
<td>Fusheng Compressor AMC</td>
<td>20</td>
</tr>
<tr>
<td>Hydraulic Expert</td>
<td>Need Basis</td>
</tr>
</tbody>
</table>

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
<table>
<thead>
<tr>
<th>Service Description</th>
<th>Frequency</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCS Computer Maintenance/ Card Repair</td>
<td>Quarterly/Need Basis</td>
<td></td>
</tr>
<tr>
<td>Outsourcing Manpower during OH</td>
<td>900 man-days/OH</td>
<td>(tentative)</td>
</tr>
<tr>
<td>CCTV and PA system Expert Services</td>
<td>Quarterly</td>
<td></td>
</tr>
<tr>
<td>Motorized Actuator Expert Services During OH</td>
<td>75 man-days /OH</td>
<td>(tentative)</td>
</tr>
</tbody>
</table>

Having AMC with OEM for above area/instrument doesn’t relieve contractor from its day to day responsibility to maintain the same by their own. Decision of calling OEM for AMC will be of BALCO. Payment of these services will be at-actual. Persons recruited for AMC will be additional and will not be considered in average entry, negotiated.

Other Services:
- Implementing and sustenance of Quality activities like 5S, Quality circles etc.,
- Preparation and maintenance of all ISO documents as per BALCO’s Requirements.
- Regular Safety and technical trainings for all contractors’ employees.
- Annual Calibration of Lab Master Instruments and testing equipments (both contractor and BALCO equipments) from a NABL accredited agency.

Tools & Tackles provided to Contractor Team

Contractor has to keep minimum manpower (for normal maintenance 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.

Minimum Tools maintained by the Team (but not limited to)
- Double end spanner all size - 1 set for 1 technician +Additional 2 Set
- Ring spanners all size - 1 set for 1 technician +Additional 2 Set
- Screw Drivers all size - 1 set for 1 technician +Additional 2 Set
- Digital Millimeters - 1 set for 1 technician +Additional 2 Set (Only Fluke Make)
- Hacksaw frame and blade - 10 Nos.
- Allen keys - 1 set for 1 technician +Additional 2 Set.
- Wire stripper - 1 set for 1 technician +Additional 2 Set.
- Cable Crimping tools - 10Set +2Set of hydraulic Crimping tools up to 1000Sqmm.
- Soldering Iron with iron and paste - 5 Nos.
- Hammer - 10 Nos.
- Screw Spanners 4 to 12” - 6 set.
- Files (flat & round) - 10 set.
- Cutting Player - 1 set for 1 technician +Additional 2 Set
- Nose Player - 1 set for 1 technician +Additional 2 Set
- Circlip Player (inner & Outer) - 10 Nos.
Paint Brush - 10 Nos.
Torch Light with rechargeable battery - 6 Nos.
Chain Block - 5 Nos. 10ons.
Rope - Depends on job requirement.
Tongue tester - 5 Nos.
Megger - 5 no’s up to 5KV
Tester - 1 set for 1 technician + Additional 2 Set
Ferrule & tag printer Printer with all types of consumables :2sets
All types of Torque wrench: 2 Sets.
Tube Bender-1 set all size.
Wielding, Grinding and cutting Set:2 Sets
Electrical Operated Torque wrench: 2 sets up to all size.
Air gun
Vacuum cleaner/blower/hot blower:2 set big size
Extension board: as per site requirement.
Tools bag/box 1 set for each technician.
Multifunction calibrator.
Milli Amp/Volt Source.
Portable analyser (O2, Sox, Nox, CO)
Portable clamp on flow meter upto 2 meter dia pipe

Consumables: Following list of consumable items to be under scope of vendor (but not limited to)
1. Contact Cleaner all type( crc, non crc etc)
2. Lubricants + paints
3. Copper tube/flexible tube only for lab purpose
4. Glass Fuse + Terminal Blocks
5. Ferrule/Tag printing consumables.
6. Teflon Tapes + Insulation tapes.
7. Gaskets for valves/flow meters/etc and O- rings
8. Pipe fittings /connectors /ferrules / screws/bolts/nuts etc
9. Buffer solution for PH calibration
10. Lugs up to 25 sqmm all type (Cu &Al) & cable ties
11. Safety gloves/goggle /masks/ear plugs/cleaning cloth etc
12. Calibration gases for analyzers.
14. Cotton waste/marking cloth
15. Ambry paper all type.
16. Yellow/black strip for 5s
17. Flexible copper cable multistrand single core for looping, panel wire, extension board etc. up to 4 sqmm.
SCOPE OF WORK FOR O&M OF AHP/CHP – 4x300 MW

CHP/AHP Area, system and associated sub system:-

Track Hopper area top to bottom (Paddle Feeder to bunker floor) Coal Feeding systems including Stacker cum Re-claimer, screen, crusher, DE System, DS system connected with conveyor, Coal Yard, vibro feeder, vibrating screen, ILMS, ventilation system, sump pumps, sampling system, dynamic circle chain, Emergency Bin, transfer towers and conveyors, bulk remover and buffer drum system, hoist system, interconnection with S40, BOBRN Compressor house, CHP control room, plough unloader-diverter system, auto Coal Sampler etc. Ash Handling Plant from bottom of ESP field 1, 2 & Bag filter field 3, 4 & 5 (knife edge gate valve) vessel/isolation valve to silo to ash dyke & bottom ash scraper chain conveyor to Ash dyke including Economizer hopper/APH hopper to complete discharge point up to Ash Pond including GEHO Pumps, Dry Ash Conveying system, Silo, Bag Filter of silo, ART, screw conveyor, Submerged Scrapper Chain Conveyor, Ash Slurry Pump and system, Clinker Grinder, Dewatering Bin, Weigh feeder, Conveyor, Fresh Water, settling tank Pond and HP LP Pumps, BAWR system, AHP air Compressor, dryer, Blower, heater, Fire Fighting and PLC Monitoring system, all control room of AHP & CHP etc.

System Over view:-

Coal will come in wagons/trucks, which will be unloaded by coal unloading agency at track hopper. Coal evacuate from track hopper with four number of paddle feeder. Two streams of belt will take this coal either to bunker or yard. Two stacker and reclaimer will perform stacking and reclaiming.

Compressors are available for BOBRN unloading. Fly ash conveying is available from ESP/AHP/ECONOMIZER hoppers to silo through compressed air. Bottom ash will be conveying to DB through SSC and ash slurry pump. Bottom ash and fly ash to be dispose to ash pond through HCSD system. Ash bulker or open truck ash disposal are also possible. Compressors are available for fly ash conveying.
For each activity various measuring instruments and remote PLC/HMI control system along with Local control panels are available.

CHP MV switchgear contains two 6.6kV bus sections with bus-coupler and is charged through two sections from 6.6kV station switchgear. CHP switch gear feeds 2X2MVA (6.6/0.415kV) Transformer to meet LV loads. Two numbers stacker cum reclaimer, eight numbers HT Motors and spare 6.6kV feeder.

AHP PCC is charged through two source breaker from station switchgear through 2 X 2MVA (6.6/0.415 kV) transformer carrying load of Silo MCC, HCSD MCC, FOPH MCC, Sewage MCC.

**Scope of Work for CHP (Operation) – 1200 MW**

O&M Agency shall be responsible for entire Operation of Coal Handling Plant. The brief scope of work is outlined below.

- Operation of all equipment from bottom of track hopper/ Dozing point of truck hopper area BOBR Compressors/ Hoists/sprinkling systems/ conveyor belt safe guard) to Boiler Bunker for both bunkering path & Stacking/reclaiming path.
- Stacking, feeding & dozing of coal from truck hopper top to boiler bunkers/coal yards. O&M of all equipment from truck hopper top, Vibro feeders, conveyor belts, chute, CBMS (cross belt magnetic separator), ventilation fan etc.
- Stacking & Feeding of coal from coal yard to Boiler Bunkers as per the ‘Mix’ required by BALCO from time to time through stacker & reclaimer and inclusive management of all coal yards (As per EIC instructions).
- Dozers (3 nos.) required for yard management would be provided by service provider. Dozer Maintenance Shed, Fuel, will also be provided by BALCO. Operation and Maintenance of Dozer is under scope of Service Provider. 24 Hrs skilled dozer operators to be provided by service provider.
- Manual Water Injection through hose pipes in coal heaps of all coal yards to prevent fire in coal, helping fire service in case of any fire incidents in CHP will be done by Service Provider. Service provider to ensure zero incidents of fire caused by coal in all CHP area.
- Sprinkling to be done during summer for coal yards.
- Service Provider will supervise all the movement of truck inside plant for shifting of coal from one area/yard to other area/yard/ dozing point and to supervise the movement/unloading of coal received by trucks at the coal yard. Service Provider to ensure proper management of coal yard such as stacking, reclaiming and proper heap preparation as per the requirement of Balco. All Yards/Heaps/areas is to be prepared for PV by 25th of every month. All loose material to be charged, stones to be arranged as per direction of EIC.
  - Service Provider will be assisting the coal PV by providing manpower, one shovel (belcha) and bucket welding as required by EIC at the time of PV.
  - All equipment in CHP area shall be operated as per the SOP and the instruction of EIC.
  - Service Provider to ensure 95% availability of all DE & DS system. Coal Dust Bag Hopper in entire CHP area is to be drained on daily basis and is to be fed on belt/to be shifted to any location inside Plant as per instruction by EIC.
  - Stone Picking from Conveyors on continuous basis in all three shifts in a day is to be done by Service Provider.
  - Service Provider has to ensure zero foreign particles in coal charged to Bunkers.
  - As and when required, continuous hammering and cleaning of paddle feeder, transfer chutes is in scope of Service Provider. Manpower of same has to be arranged by service provider as and when required for this job. All necessary tools required for this job are to be provided by Service Provider.
  - Electrical work like lighting, AC in weigh bridge which is related to coal handling plant inside the premises will be in the scope of service provider.

**TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS**
• Electric work in auto sampler, coal sampling room & and worker rest room will in scope of service provider.

• All related maintenance (Mechanical, electrical) of coal sampling preparation equipments (Jaw crusher, Pulverizer) will be in the contractor’s scope. Spares of equipment will be provided by BALCO.

**Scope of work for Operation of AHP – 1200 MW**

O&M Agency shall be responsible for entire Operation of Ash Handling Plant. The brief scope of work is outlined below.

• Operation of all Mechanical, Electrical, Instrumentation equipment of dry ash system of bottom of ESP field 1,2 & Bag filter field 3,4 &5 (knife edge gate valve) vessel/isolation valve (Including APH & ECO Hopper/Vessels) up to Silo and Ash dyke, wet Ash system from boiler bottom scraper chain conveyor to Ash Dyke, associated equipments such as blower, GEHO, HP-LP Pumps, slurry pumps, submerged scraper chain conveyor etc.

• O&M of level probe, fluidizing pad, vent line from vessel to hopper of ESP/Bag filter will be in the scope of service provider.

• Operation of ash conveying from of bottom of ESP field 1, 2 & Bag filter field 3, 4 & 5 (knife edge gate valve) & GEHO pump PLC or local panel is in contractor’s scope.

• Silo unloading operation is in contractor’s scope.

• Periodic cleaning of Ash Silo filters bags as and when required.

• Supply of Hose pipe for water spraying & Air blowing in AHP area is in contractors scope. Cleaning frequency should be scheduled on daily basis.

• Ash should not accumulate on ESP trench, Surface water trench & storm water drain (surrounding the Ash handing plant), cleaning the same is in contractor’s scope.

• Ash evacuations from all ECO hoppers (4 Nos.), APH hoppers (8 Nos.), ESP hoppers (8 Nos.) & Bag filter hoppers (12 Nos.) in each unit are in contractor’s scope.

• During annual overhauling, cleaning of bottom Ash sump pit of all the units are in contractor’s scope.

• Yearly cleaning of fresh water tank, settling tank and GEHO mixing tank is in contractor’s scope.

• Weekly cleaning of sump pits at a) Bottom of silo, b) GEHO pump area, c) Near fresh water tank, d) Bottom of ESP area are in contractor’s scope.

• Fresh water tank level control has to be done to avoid overflow of water.

• GEHO pump discharge pipe line inspection and area cleaning (grass cutting) as per need of maintenance.

• Discharge Ash density to be controlled as instructed by EIC.

• DE System operation on silo top is in Contractor’s scope.

• Total two nos. of mobile phones should be provided by contractor (one for operation in charge & another for shift in charge) for better communications with other departments.

• Each and every equipment should be in cleaned condition.

• Only Routine maintenance of fire fighting system (fire hydrant, delude valve spray system, fire alarm & detection system) in CHP & AHP area will be in the scope of service provider.

• All ASH handling & BOBRN compressors (14 nos. for ASH conveying, 2 nos. for BOBRN, small compressors for dust extraction system).

• (If residual ASH generated due to operation problem then removed by service

**TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS**
• O&M of 2 nos. Outside silo (near SEPCO gate) & their related system will be in the scope of service provider.

• Rotation of GEHO discharge pipe line of outside of the plant will be in the scope BALCO. Supervision will be in the scope of service provider.

  o Regular maintenance and assistance during trial of firefighting and alarming system (in CHP/AHP area only)

**Scope of Work for Mechanical Maintenance of AHP/CHP – 1200 MW**

O&M Agency shall be responsible for Mechanical Maintenance (Preventive, Predictive, Corrective, and Breakdown) of CHP/AHP. The brief scope of work is outlined below (but not limited to).

• Maintenance of all Mechanical equipment in AHP/CHP area of 1200 MW.
• The Scope includes Cold Vulcanizing of Conveyor belts
• Additional resources / manpower if required during emergency and in major breakdown to be arranged by the contractor to complete the job on time.
• Temporary plant form/scaffolding for maintenance work except Dewatering Bin is in service provider scope.
• Contractor has to do condition based monitoring as per best maintenance practices (vibration analysis, oil analysis etc CBM activities to be carried out with proper schedule, analysis reports to be submitted. Frequency will be once in a month.)
• Healthiness of standby and spare equipment to be ensured. Spares required for repair work will be provided by BALCO. Spare forecasting is to be given by the contractor time to time.
• Supply of general Purpose O&M Consumables will be in contractor’s scope.
• Sufficient tools and tackles to be provided for Operation and Maintenance activities.
• O&M Contractor has to maintain track hopper and vibro feeder (c#3/c#9) grill & gallery repairing/ replacement job.
• Pipe line laying/replacement job in CHP/AHP area.
• Any steel fabrication/ modification job which is required to improve the availability and reliability of the system in CHP and AHP.
• Pulley lagging job in all conveyor pulleys
• Replacement of filter bags on Ash Silo as and when required and replacement of fluidizing pad of the bottom of ESP hopper & vessel.
• Service provider has run leakage prevention activity rigorously. These activities include leakage of water, coal, ash, compressed air, oil in entire CHP/AHP area and for all equipment and structures (hopper, silo, pipe lines etc)
• Regular maintenance and timely PM (preventive Maintenance) of dewatering bin with its complete maintenance such as decanter pipe replacement.
• Overhauling will be done by OEM, necessary man power support shall be given by service provider. For the equipment of GEHO, Pumps, Hydraulic System, Stacker cum reclaimers, compressors, Dozers etc. OEM/EXPERT services will be required
• Boiler bottom ash trench maintenance in contractor’s scope.
• AHP related Valves minor welding work and inside the plant transportation like BALCO work shop to and fro will be in service provider scope. Inside the plant machining will be done by BALCO at their work shop. Any kind of machining of the
valve outside the plant will be done by service provider.

- Geho pump discharge line replacement & rotation work inside/outside/upto ash dyke is in scope of contractor’s scope according to De-metering.
- De-metering of pipe line (Thickness measurement of GEHO discharge line) at least once in a year is in contractor’s scope (if required partial De-metering of GEHO or other lines of AHP to be done before plant shutdown).
  In existing pipe line (fly ash, bottom ash, water line) any bends or a length of pipe to be repair/replaced due to erosion will be in the scope of service provider.
- Online sealing of any leakage (if pipeline isolation is not possible) is in contractor’s scope. ESP Hopper fluidizing pad maintenance and replacement is in contractor’s scope.
- Due to any fault in the system with respect to material failure and unavailability of spares/mechanical isolation of line (dummy) is in contractor’s scope.
- Service provider has to do every maintenance job and OEM Service engineer’s visits to be organized by service provider.
- Chute repairing like patching will be in contractor scope.

Scope of Work for ELECTRICAL & C&I Maintenance of AHP/CHP - 1200MW

O&M Agency shall be responsible for Electrical and C&I Maintenance (Preventive, Predictive, Corrective, and Breakdown) of CHP/AHP. The brief scope of work is outlined below (but not limited to).
Preventive, predictive, shutdown and breakdown maintenance for entire AHP/CHP areas equipments - instruments and their internal /accessories.

Up keep of all the electrical and C&I PLC /SCADA/HMI, AB VFD, ABB VFD etc. Agency will have to tie up with OEMs (Allen Bradley, Siemens etc) for maintenance of PLC. however OEM Service engineer’s visits to be organized by service provider.
Regular collection of logic and graphics backup, upkeep of logic. Communication checking, data transfer, collection, loop and continuity check. Modification, forcing and bypassing not allowed. (Without getting it approved through Change Order note - system. In emergency if such activity if required must be done with written consent of Balco engineer. Any alteration (Hard/soft) can only be done by written consent of BALCO Engineer in charge.

- Condition monitoring of control system and instruments.
- Calibration of belt scale by external agency Quarterly.
- Upkeep of all the IT equipment provided by Balco (PC/IP phone/Network switch etc)
- Maintenance of Nucleonic density meter in GEHO Pump discharge line.
- Maintenance of Motor, pump, actuator and Rewinding/ repair of the same is Contractor scope.
- Spare forecasting and consumption report, reconciliation status.
- Upkeep of indoor and outdoor panel
- Rain and dust proofing of outside instruments and panels.
- Replacement of Control & power cable laying, jointing, lugging ,termination/tray laying,
dressing ferruling as and when required

- Earth Pit maintenance, Maintenance of Equipment earthing.
- Upkeep of OFC network and communication up to BTG CCR. Upkeep of HME/SCADA/Server in main BTG CCR related to CHP & AHP. OFC cable splicing if required.
- Maintenance of Master calibration instruments related to CHP/AHP provided by BALCO. Routine and Breakdown maintenance of lab facilities like MCB’s Sockets, Heaters and Owens, etc. LHSC cable maintenance.
- Maintenance of Public Annunciation System

- All kind of testing of existing Transformers/HT Motors. Testing of HT Motors with Megger (Megger make HT & LT insulation tester, Fluke multi meter will be in contractor scope). Hipot test will be done by service provider (Kit will be provided by BALCO) control and power cable laying, cable termination, cable jointing is in service provider scope as per maintenance practice/SMP.
- Vibration and Displacement Checks as per need with kit will be in service provider scope.
- CBM of HT/LT motor which includes cleaning, checking, repairing, replacement/ topping of lubricant, Bearing heating/ removal/ replacement, removal/ fixing of motor earthing, rotar removal and thread in; tightness checking of terminal connection, lugging and crumping of controle and power cables; varnishing of stator, checking of stator wedge tightness, rewedging, replacement of motor; checking, testing and replacement of winding and bearing RTDs, Circuit Breaker or starter operations, earth connections, control and power cable laying & termination, cable jointing. Jointing kit will be provided by BALCO.
- Maintenance of EOT, Monorail, Hoists along with Tightness checking of pantograph, termination of control and power cable, laying & jointing, limit switch checking and adjustment.
- 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. Same will be provided by BALCO.
- Exhaust fans Replacement in CHP/AHP area. Spares will be provided by BALCO
- Lightening arrester checking and testing of CHP/ AHP area. All type of ladders and approach to work at heights/street lights to be arranged by O&M service provider.
- Maintenance of HVAC System including window AC, split AC and Centralized air conditioners, water coolers and purifiers of CHP-AHP area and offices. Cleaning, checking, repair and replacement of Air filters/ fans/ replacement of compressor replacement and jointing of copper pipe (Copper pipe will be provided by BALCO) AC control circuit checking and replacement of cards.
- Testing of all lifting tools & tackles and certificate of fitment once in year.
- Liasoning along with cost incurred with Electrical inspector will be under the scope of the contractor and the actual cost will be reimbursed from BALCO.
Scope of Work Common for Operation and Maintenance of AHP/CHP (Every Department)

Maintenance of all equipments for amenities like A/Cs, Water coolers, Offices, Labour Shed, etc in AHP/CHP is in contractor’s scope. All type of piping and plumber related work will come under contractor scope.

O&M Agency has to follow all standards for ISO systems. Service provider has to prepare documents related QMS, OHSAS, EMS, and any other data or document as required for any internal and external audits to be conducted in BALCO. Report generation and documentation (FAR/daily/monthly/safety/history/RCA/FMEA etc.) SAP to be used for PP, PM and MM modules. Filled logbook duly signed by the supervisor should be submitted to BALCO engineers daily. However the completed log book should be handed over to BALCO for future reference. Daily report preparation & reporting to be done to respective EIC and all HOD’s in BALCO prescribed format and methods.

At the end of all shifts, feedback for progress of work and plan for next day is to be discussed and submitted in writing. Shift wise operational reporting. Preparation of shift logbook, filling of data sheet, check list and all other relevant stationeries required for the job is to be provided by service provider.

Shifting, Loading, Unloading of materials inside the plant premises such as, movement from store/workshop to workplace, central store to local store, and vice versa, with arrangement of hydra, lifting tools and suitable vehicle will be in contractor scope. Assistance for material inspection at site/store.

Sufficient and skilled Manpower (In-charge, Engineer, Supervisor, Operator, Helper, Technician, Draftsman, Welder, Fitter, Rigger, Safety officer) to be provided for Operations / maintenance activities to handle General and A/B/C shift to meet deliverables.
Contractor should have electrical contract license (class A) from Chhattisgarh Government and license holder technicians/supervisors for working in LT and HT electrical system up to 6.6KV.

Common Mobile and Phone Number has to be provided to operation for effective, Communication and daily reporting to EIC along with sufficient number of Walkie Talkies. Any damage to Balco assets including civil structure at CHP/AHP area due to contractor mishandling will be repaired by contractor himself within 15 days.
Any minor repair work in operator’s room, cabin, workshop, stores and storage yards is in contractor’s scope. Modification jobs (outsourced by owner) supervision shall be done by agency. All modification jobs are to be entered in to the master drawings and modified part drawing must be pasted on the respective panel. One set of manual and drawings to be handed over to the contractor.
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 the approval of owner.

Service provider has to follow all rules related to safety (industrial, personal, vehicle, road safety etc).Any instruction by BALCO EIC regarding safety is obligatory for service provider.

Painting for safety and 5S improvement and compliance, equipment protection (excluding structural painting) along with the supply of Paints and related tools will be in service provider’s scope.
Housekeeping of Entire AHP/CHP (Including buildings, all drains of AHP & ESP area and ash bulker weighbridge, conveyor area, bunker floor, track hopper, yard, unloading area, offices, etc on daily basis or as instructed by BALCO EIC).
New Fly Ash conveying and associated system under construction common for CPP -2 and 1200MW will be in the scope of service provider.
• SAFETY/HIHE/5S

O&M Agency shall appoint full time qualified safety Officer (certified diploma or degree in industrial safety) who will ensure safety aspects in all activities of CHP/AHP. Any Violation in safety will lead to penalty.

Contractor to ensure Safety at workplace, obey safety rules, adopt Work permit system, proper check sheets, placing of danger board, men on work board. All contract employees shall identify and report any hazard/incident/accident and shall work on to eliminate all identified/possible hazards and incidents. Strictly follow proper tagging, LOTO system.

Contractor has to supply torch light in confined areas during working. Contractor has to improve and maintain the workplace for achieving good score in 5S. 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, 33KV), helmet, earplug, safety shoe, fuse Pullers, Torch light and insulated tools etc.,

Compliance of all safety norms and audit points is in Contractors scope. Service Provider to follow Safety rules regarding Safety PPEs and their usage, Rope & Sling safety rules, Technological vehicle safety rules and other BALCO safety rules as applicable in CHP/AHP area. Service Provider to follow all guidelines of Welding, Gas handling inside plant as given by Safety Dept. of BALCO. All statutory requirements to be followed by contractor.

• HOUSEKEEPING –

Service Provider is to ensure 100 % cleaning of all areas of CHP/AHP starting from Track Hopper, BOBRN Compressor House, Ground Hopper, Conveyor Belts area, Crusher Building, Bunker Floor, Stacker & Reclaimers, Settling Ponds, Sampler area, CHP/AHP Office Building, Dozer maintenance Sheds and any other working area in CHP/AHP.

All coal spilled in Conveyor Belts, Crusher Building, Bunker Area, and Stacker & Reclaimer bay, Take up area of all belts and all other working areas, is to be charged on daily basis. if the spilled coal is not cleaned within five days, the same will be lifted and charged by deputing some other agency by BALCO and cost of same will be debited to Service Provider’s bill.

Cleaning of Coal water settling pond and rain water settling pond is to be done by service provider as per the direction of EIC.

All Drains (surface water drain, storm water drain) and drain pits of CHP/AHP area are to be cleaned on monthly basis and in Rainy Season (July-October), drains are to be cleaned on weekly basis. Coal found in cleaning of drains is to be processed and charged or shifted to any place in CHP/AHP as per the direction of EIC. Coal recovered from Coal Settling pond and rainwater settling pond will also be processed and charged or shifted to any place in CHP/AHP as per the direction of EIC and other materials found from drains, Coal Settling pond and rainwater settling pond will be disposed to a location inside BALCO Plant as per the direction of EIC. ( Except High stock/stocking of excess quantity in the yard)

All Panels of CHP/AHP area is to be cleaned by domestic Vacuum cleaner.

Service Provider to depute one full time Housekeeping Supervisor to ensure complete housekeeping in entire CHP/AHP area.

Charging of coal in belts coming out of Bulk Remover and Collection and shifting of stones coming out of Bulk remover to any place in CHP area as per direction of EIC is to be done by Service Provider.

Cleaning of all Sump Pits in entire CHP/AHP area on Monthly basis is to be done by Service Provider. And in rainy season Cleaning of all Sump Pits in entire CHP/AHP area on weekly basis is to be done by Service Provider. Shifting of All foreign material removed while
cleaning of sump pits to any place inside CHP/AHP area as per direction of EIC is to be done by Service Provider.
Collection and Removal of tramp Iron coming through Magnetic Separator in CHP area, iron pieces lying in conveyor gallery, transfer towers and shifting of same to any place inside plant as per direction of EIC is to be done by Service Provider.
Collection and Removal of all debris coming while cleaning of entire CHP/AHP area and shifting of same to any place inside BALCO Plant as per direction of EIC is to be done by Service Provider.

**SCOPE OF VEHICLES FOR CHP/AHP round the clock Available.**

1. 3No Dozer
2. 3No Hywa
3. 2No Pocklain (1 more at the time of rainy season for about 4 months/need Basis)
4. 1No Loader (1 more at the time of rainy season for about 4 Months/need Basis)
5. 2No JCB
6. 3No Bobcat

Contractor has to ensure round the clock availability of the equipment.

**Tools, Tackles & Consumables for AHP/CHP:**
The agency shall supply tools and tackles necessary for the Service as per attached Annexure -1. All tools and tackles including mobilization tools brought to the Project by agency shall be agency’s property and shall be taken away by the agency at the time of termination of the contract.

**LIST OF CONSUMABLES**

1. Kerosene, diesel, petrol and rust remover, CTC, Benzene etc.
2. Hacksaw blades.
4. Marking cloth and old cloth.
5. Asbestos cloth.
6. Prussian blue.
7. Lead wire (1.0 mm, 1.5 mm, 0.5 mm)
8. Liquid soap/soap powder.
9. Carborundum grinding paste (fine, medium and coarse)
10. Cut off wheels.
12. Sealing agents like M seal etc
13. Adhesive agents like locktite etc
14. Cleaning agents like WD-40, Terpentine oil etc
15. Oil stones.
17. Oxygen and D/A cylinders.
18. DP test kit and coir rope.
19. Chalks, marking pens, and thermal chalks up to 600°c
20. Insulation and medical tapes.
22. Material for blast cleaning purposes.
23. Hand gloves (asbestos and rubber), manila rope.
25. Air blower (electric)
26. Electric drills of various sizes
27. Ball pen hammer of various sizes.
29. Magnifying glasses.
30. Safety Helmets for labors.
32. Argon gas welding equipment.
33. Hand gloves Cotton & Leather.
34. Shims of various thickness
35. Sealant putty
36. Gland Ropes of different sizes
37. Oil/water/paper/rubber & metallic gaskets( Special high temp. spiral wound gasket is in the scope of BALCO)
38. Industrial paint (Yellow, Green, Black, Smoke grey, Red etc) , paint brush & thinner
39. LT bolts , Nuts and washers of sizes up to 36 mm
40. HT bolts , Nuts and washers of sizes up to 24 mm
41. Oil seals of all sizes
42. O-ring cords of all sizes
43. Silastic sealant
44. Anabond gasket sealant
45. Nitrogen cylinders
46. Fire suit
47. Steam suit
48. Graphite tape
49. Graphite powder
50. Thejo solution for belt joint
51. Holding liquid sealant
52. Jointing sheets
53. Insulation screw
54. Insulation Tape
55. Kerosene
56. Lead wire
57. Lugs( Aluminum)
58. PVC solution
59. Paintbrush
60. Pendent holder
61. Petrol, diesel
62. Petroleum jelly
63. Precision blue paste
64. Raval plugs
65. Rustolene
66. Sand paper
67. All kind of washers
68. Shellac
69. shims
70. sholdering paste
71. Sholdring rod
72. Spark lighter
73. Steam gasket sheets
74. Teflon tape
75. Twine
76. Varnish
77. Welding glasses german/white
78. Welding welders
79. Safety belts
80. Drill Bits
81. Emery sheet(Coarse & finr)
82. F.G tap varnished roll
83. Fevicol
84. Fevifold
85. Fibre glass sheet
86. Gouch screws
87. Grinding paste(coarse & Fine)
88. Holdite Graphite compound
89. Wood screws
90. Thejo hardner
91. Nipple grease gun

This list is only indicative and not exhaustive. Arrangement for any other consumables required for timely completion of the job shall be the responsibility of the Contractor

**LIST OF T&P**

<table>
<thead>
<tr>
<th></th>
<th>Welding Generator with Regulator</th>
<th>Standard make</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Welding Transformer</td>
<td>Standard make</td>
</tr>
<tr>
<td>2</td>
<td>Chain Pulley Blocks</td>
<td>10T</td>
</tr>
<tr>
<td>3</td>
<td>Chain Pulley Blocks</td>
<td>5T</td>
</tr>
<tr>
<td>4</td>
<td>Chain Pulley Blocks</td>
<td>3T</td>
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<tr>
<td>5</td>
<td>Chain Pulley Blocks</td>
<td>2T</td>
</tr>
<tr>
<td>6</td>
<td>Chain Pulley Blocks</td>
<td>1T</td>
</tr>
<tr>
<td>7</td>
<td>Pulling Lifting M/c</td>
<td>3T</td>
</tr>
<tr>
<td>8</td>
<td>Pulling Lifting M/c</td>
<td>1.5T</td>
</tr>
<tr>
<td>9</td>
<td>D/E Open Spanners</td>
<td>Up to 75</td>
</tr>
</tbody>
</table>

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
**TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS**

<table>
<thead>
<tr>
<th>No.</th>
<th>Item Description</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>D/E Ring Spanners</td>
<td>Up to 75</td>
</tr>
<tr>
<td>12</td>
<td>S/E Long handle Open Spanners</td>
<td>50, 55, 60, 65, 70, 75</td>
</tr>
<tr>
<td>13</td>
<td>Star Hammering Spanners</td>
<td>24, 30, 32, 36, 41, 46, 50, 55, 60, 65, 70, 75</td>
</tr>
<tr>
<td>14</td>
<td>Box Spanner</td>
<td>Up to 75</td>
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<tr>
<td>15</td>
<td>T - Handle for above</td>
<td></td>
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<tr>
<td>16</td>
<td>Tubular Spanner</td>
<td>6 x 7 to 30 x 32</td>
</tr>
<tr>
<td>17</td>
<td>Adjustable Spanner</td>
<td>12”, 6”</td>
</tr>
<tr>
<td>18</td>
<td>Pipe Wrench</td>
<td>24”, 18”, 12”, 6”</td>
</tr>
<tr>
<td>19</td>
<td>Screw Driver</td>
<td>18”, 12”</td>
</tr>
<tr>
<td>20</td>
<td>Torque Wrench</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Combination Pliers</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Outside Circlip Pliers</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Inside Circlip Pliers</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Nose Pliers</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Hydraulic jack with pump</td>
<td>100T</td>
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<tr>
<td>26</td>
<td>Hydraulic jack with pump</td>
<td>50T</td>
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<tr>
<td>27</td>
<td>Button Hydraulic Jack Pump</td>
<td>20T, 50T</td>
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<tr>
<td>28</td>
<td>Crow Bar</td>
<td>1”</td>
</tr>
<tr>
<td>29</td>
<td>Temperature Gun</td>
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</tr>
<tr>
<td>30</td>
<td>Bending Machine</td>
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<tr>
<td>31</td>
<td>Motorized Chain Block</td>
<td></td>
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<tr>
<td>32</td>
<td>Sledge Hammer</td>
<td>20lbs, 10lbs, 4lbs</td>
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<td>33</td>
<td>BP Hammer</td>
<td>1.5lbs</td>
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<tr>
<td>34</td>
<td>Outside Micrometer</td>
<td>0 - 25</td>
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<tr>
<td>35</td>
<td>Outside Micrometer</td>
<td>0 - 150</td>
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<td>36</td>
<td>Outside Micrometer</td>
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<td>37</td>
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<td>38</td>
<td>Inside Micrometer</td>
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</tr>
<tr>
<td>39</td>
<td>Inside Micrometer</td>
<td>50 - 1000</td>
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<tr>
<td>40</td>
<td>Vernier Caliper</td>
<td>12”</td>
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<tr>
<td>41</td>
<td>Vernier Caliper</td>
<td>6”</td>
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<tr>
<td>42</td>
<td>Dial Gauge with Magnetic Stand</td>
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<tr>
<td>43</td>
<td>Allan Key</td>
<td>14, 16, 20, 24</td>
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<tr>
<td>45</td>
<td>Gas Cutting Set</td>
<td></td>
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<tr>
<td>46</td>
<td>Argon Set</td>
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<tr>
<td>47</td>
<td>Welding Cable</td>
<td>400 amps</td>
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<tr>
<td>48</td>
<td>Master Level</td>
<td>4”</td>
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<tr>
<td>49</td>
<td>Spirit Level</td>
<td>8”</td>
</tr>
<tr>
<td>50</td>
<td>Plum bob</td>
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<tr>
<td>51</td>
<td>Shim Cutter</td>
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<tr>
<td>52</td>
<td>Angle Grinder</td>
<td>AG - 7</td>
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<td>53</td>
<td>Angle Grinder</td>
<td>AG - 5</td>
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<td>54</td>
<td>Angle Grinder</td>
<td>AG - 4</td>
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<td>55</td>
<td>Straight Grinder</td>
<td>GQ - 4</td>
</tr>
<tr>
<td>56</td>
<td>Flexible Shaft Grinder</td>
<td>FF - 2</td>
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<tr>
<td>57</td>
<td>High Speed Grinder</td>
<td>HSG</td>
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<tr>
<td>58</td>
<td>Portable Drilling M/c</td>
<td>up to 12 mm</td>
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<tr>
<td>59</td>
<td>Hole Punch</td>
<td>Assorted Size</td>
</tr>
<tr>
<td>60</td>
<td>Drill Bit</td>
<td>Assorted Size</td>
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<td>61</td>
<td>Wire Rope Slings</td>
<td>Assorted Size</td>
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<td>Item Description</td>
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<tr>
<td>62</td>
<td>Eye Bolt Assorted Size</td>
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<tr>
<td>63</td>
<td>Wooden Sleepers</td>
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<tr>
<td>64</td>
<td>Scaffolding Pipes 6 mtrs length</td>
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<tr>
<td>65</td>
<td>Scaffolding Pipes 3 mtrs length</td>
<td></td>
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<tr>
<td>66</td>
<td>Scaffolding Clamps (Fixed type)</td>
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<tr>
<td>67</td>
<td>Scaffolding Clamps (Swivel Type)</td>
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<tr>
<td>68</td>
<td>Scaffolding Planks (Metallic)</td>
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<tr>
<td>69</td>
<td>Bearing Puller</td>
<td></td>
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<td>70</td>
<td>Measuring Tape</td>
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<tr>
<td>71</td>
<td>Torch</td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>Bearing Heaters</td>
<td></td>
</tr>
<tr>
<td>73</td>
<td>Chop saw Machine</td>
<td></td>
</tr>
<tr>
<td>74</td>
<td>Magnetic drill machine</td>
<td></td>
</tr>
<tr>
<td>75</td>
<td>Hand drill machine</td>
<td></td>
</tr>
<tr>
<td>76</td>
<td>Thread die (mm) 4 to 24</td>
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<tr>
<td>77</td>
<td>Thread die(inches) 4 to 24</td>
<td></td>
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<tr>
<td>78</td>
<td>Valve-seat lapping machine, portable lapping machine (Motorized or pneumatic)</td>
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<tr>
<td>79</td>
<td>Torque wrench (Motorized or hydraulic)</td>
<td></td>
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<tr>
<td>80</td>
<td>Bench vise</td>
<td></td>
</tr>
<tr>
<td>81</td>
<td>Angle finder</td>
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</tr>
<tr>
<td>82</td>
<td>Needle dial gauge</td>
<td></td>
</tr>
<tr>
<td>83</td>
<td>Pedestal Fan with chicken mesh covering and extension cable with plug / socket 2</td>
<td></td>
</tr>
<tr>
<td>84</td>
<td>DC lamps</td>
<td></td>
</tr>
<tr>
<td>85</td>
<td>AC to DC convertor (Portable transformer kit)</td>
<td></td>
</tr>
<tr>
<td>86</td>
<td>Laser alignment kit</td>
<td></td>
</tr>
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<td>87</td>
<td>Bearing / Coupling Puller</td>
<td></td>
</tr>
<tr>
<td>88</td>
<td>Nitrogen filling kit for accumulators</td>
<td></td>
</tr>
<tr>
<td>89</td>
<td>Portable exhaust fan with accessories</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>Slide wrench</td>
<td></td>
</tr>
<tr>
<td>91</td>
<td>Tripod stand for working in confines space</td>
<td></td>
</tr>
<tr>
<td>92</td>
<td>Public announcement system / kit</td>
<td></td>
</tr>
<tr>
<td>93</td>
<td>White boards</td>
<td></td>
</tr>
<tr>
<td>94</td>
<td>Display / Notice boards</td>
<td></td>
</tr>
<tr>
<td>95</td>
<td>Vacuum cleaner</td>
<td></td>
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<tr>
<td>96</td>
<td>Dewatering pump with accessories</td>
<td></td>
</tr>
<tr>
<td>97</td>
<td>Safety net for work at height</td>
<td></td>
</tr>
<tr>
<td>98</td>
<td>Safety belts (Double hooking)</td>
<td></td>
</tr>
<tr>
<td>99</td>
<td>Rescue kit for work at height</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>Portable welding machine with accessories</td>
<td></td>
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</tbody>
</table>
This list is only indicative and not exhaustive. Arrangement for any other T & P required for timely completion of the job shall be the responsibility of the Contractor

As per Annexure –I

BILL OF QUANTITIES.

O & M Contract Cost Per Months CPP 540 MW

O & M Contract Cost Per Months 1200 MW

4) CONTRACT PERIOD.

Three Years form the date of award of work order

5) COMMERCIAL TERMS & CONDITIONS

A) CONTACT PRICE:

<table>
<thead>
<tr>
<th>S.N o.</th>
<th>Description</th>
<th>Month</th>
<th>Monthly Price (Rs)</th>
<th>Annual Amount (Rs)</th>
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<tr>
<td>1</td>
<td>O &amp; M Contract Cost Per Months CPP 540 MW</td>
<td>12</td>
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</tr>
<tr>
<td>2</td>
<td>O &amp; M Contract Cost Per Months 1200 MW</td>
<td>12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

YEAR ON YEAR ESCALATION

- The rates quoted are inclusive of all costs towards statutory compliances. (Service Taxes Extra/GST). Payment shall be made based on actual quantities executed or part thereof.
- The rates shall remain firm and binding during the currency of the contract and shall not be subject to any escalation except for circumstances which would be discussed & mutually agreed upon.
- The above prices are inclusive of all costs towards tools, tackles, material, consumables, as well as sufficient number of skilled/ unskilled manpower, which shall be required for ensuring smooth execution of the work.
- The Service provider shall provide manpower after getting formal permissions from HR department.
- The above prices are inclusive of all taxes & duties. TDS, as applicable, shall be deducted from your bills.

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
The above prices are inclusive of all the requisite coordination which may be incurred for smooth execution of the job.

**Taxes & Duties:**
The contract price shall be inclusive of all taxes, duties, levies and imposts or any other tax, be it livable by Central, Provincial or Local Authorities. Service Tax shall be paid at actuals on submission of documentary evidence. Any statutory variation in taxes and duties and/or imposition of any fresh taxes/duty shall be reimbursed at actual against proof of payment. TDS for Income Tax and Works Contract Tax shall be affected from your bills as per prevailing statute and relevant certificates shall be furnished to you so as to enable you to take necessary tax credits.

**Payment Terms:**
1. 90% payment along with 100% taxes and duties after submission of Monthly RA bill, NO dues certificate duly certified by EIC along with BALCO HR Clearance document duly. The payment shall be made within 30 days from the date of submission of invoice.
2. Balance 10% against submission of security deposit Bank Guarantee of Equivalent amount as per BALCO format, valid for contract duration + 3 months claim period.

**Security Deposit:**
Security Deposit of 10% of the Contract Value in the form of Bank Guarantee in Balco’s Standard format to be submitted positively within 15 days from the date of award of contract.

1. In connection with the execution and delivery of this Agreement, the Service Provider has delivered to the Owner the Performance Bank Guarantee as security for the performance of its obligations under this Agreement.
2. For due, proper and faithful fulfilment of obligations under this Agreement, the Service Provider shall furnish a performance bank guarantee of 10% of the Contract Fee. The bank guarantee shall be valid till the contract period. In addition, the bank guarantee should have claim period of 3 months.
3. The Service Provider shall ensure that the Performance bank Guarantee at all times remain valid and in full force and full effect in the full required amount through the period ending ninety (90) Days after the full and final settlement of all claims and payments required to be made between parties under this Agreement.
4. The validity of Performance bank guarantee shall be automatically extended under the same conditions for any and all modifications, alterations, variations and extensions of time to this Agreement, as they occur during and in accordance with this Agreement, and without the Owner having to supply notification from any third party or obtain consent to such modifications, alterations, variations of extensions of time this Agreement.
5. Failure by Service Provider to maintain Performance Bank Guarantee at all times as required shall constitute a material breach of this Agreement, and, upon a either lapse of Performance Bank Guarantee or upon failure by the Guarantor to immediately honor without protest or demur its obligation under the performance Guarantee upon any demand by the Owner, the Owner may, at its discretion, recover the amount due from Service Provider from outstanding invoices or money due with owner, terminate this Agreement under the relevant provision of this Agreement regarding termination.

6. If the Performance Bank Guarantee furnished by the Service Provider shall become unacceptable to the Owner due to change in the business or financial condition of the Guarantor, or if Guarantor fails to furnish reports to its financial conditions from time to time as requested by the Owner, the Service Provider shall promptly furnish such alternative performance bank guarantees in form and from companies and/or financial institutions as may reasonably be required by the Owner to protect the interests of the Owner.

6) GENERAL TERMS & CONDITIONS OF BALCO WILL FORM AN INTEGRAL PART OF THIS TENDER SPECIFICATION

Kindly read the same & provide acceptance over the same.

Mandatory Points:
Vendor has to provide acceptance over the tender document along with Balco General Terms & conditions

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:

(a) 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.

(b) 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.

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.

1. 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.

9. 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:

(ii) Copy of registration certificates under Indian tax/other laws including but not limited to Service Tax, Excise, import export code etc., as applicable.
(iii) 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.

8.3 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.

8.4 The Company may dispute any amount on an invoice and withhold the disputed amount provided that:

(b) 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;

(c) 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.

8.5 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.

10. TAXES

9.1 Definitions

For the purposes of this Clause 9:

(b) “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:

(b) 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 subcontractors 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.
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.

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 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.
10.3 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 authorised 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 organised 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
14. FORCE MAJEURE

14.2 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.

14.3 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.

14.4 Save as otherwise expressly provided in the Agreement, no payments of whatever nature shall be made in respect of a force majeure occurrence.

14.5 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 forbear 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 Balco.whistleblower@vedanta.co.in.

15.4 The Service Provider agrees to comply with the provisions of the Company’s Supplier Code of Conduct and the Company’s Human Rights Policy 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 maintain records and provide to the Company upon request such records and evidences, as the Company may reasonably require, confirming the Service Provider’s
compliance with the obligations under Clause 15.4.

15.6 The Service Provider shall comply with the Anti-Bribery and Corruption (AB&C) requirements as applicable to them.

15.7 The Company shall have the 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.

15.8 Notwithstanding anything in this agreement, Company shall have the right to terminate the Agreement forthwith in case, it is found that the Service Provider has failed to comply with AB&C requirements.

15.9 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 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: Balco.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 Korba, Chhattisgarh [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 Korba, Chhattisgarh [India].
(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.

OTHER TERMS & CONDITIONS

17. STATUTORY COMPLIANCES & CLEARANCES

a) The Service Provider shall be solely liable for Statutory Compliance in respect of all applicable laws of land existing as on the date of the Contract as well those notified by the Central/State Government from time to time including but not limited to compliance of provisions of Contract Labour (Regulation and Abolition) Act, 1970, Employees State Insurance Act, 1948, Employees Provident Funds and Miscellaneous Provisions Act, 1952, Minimum Wages Act, 1948, Payment of Bonus Act, 1965, Payment of Gratuity Act, 1972, Payment of Wages Act, 1936, Employees Compensation Act, 1923, Interstate Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979 etc in respect of all employees employed by the Service Provider, directly or indirectly or through any sub-contractor. The Service Provider shall be solely responsible for maintenance of records and filing of various forms/returns prescribed under all applicable Central/State Labour laws and Regulations/Rules made thereunder in respect of Workmen employed or engaged by it.

b) Company shall be entitled to deduct/adjust from amount payable to the Service Provider, any dues, wages, compensation on accident or death, expenses incurred for benefits, provision for amenities and amounts paid or payable by the Company in compliance with the applicable laws, in respect of workmen/employees of the Service Provider.

c) The Service Provider shall ensure compliance under the Safety Provisions of the applicable State/Central laws and shall ensure that its employees are trained, competent, physically and mentally fit for the assignment and are not suffering from any chronic or contagious disease.

Service Provider is responsible for the safety and security of all men and materials employed by him. Service Provider should provide all safety equipment (such as tools & tackles, aprons, gloves, safety shoes etc) to all Service Provider team members. Service Provider should provide adequate coverage against any accident met by Service Provider’s team during the period of Contract. Service Provider shall indemnify the Company and its officers against any claim, dispute and litigations arising in this regard. Further no separate consideration shall be payable by Company for the same.

The Service Provider shall take all the required clearances under the applicable laws which includes but is not limited to Environment Protection Act, CG Land Revenue Code, CG Municipal Corporation Act etc. for successful discharge of all his obligation under his scope of work.

18. SUSPENSION

No compensation for alteration of schedule or suspension of work.: If at any time after the award of contract the BALCO shall for any reason whatsoever not require the whole work done or part thereof as specified in the acceptance of the contract, BALCO shall give notice in writing of the same to the Service Provider and the Service Provider shall not be entitled to any compensation and/or damage of any kind whatsoever, nor the contractor will be entitled to any claim for compensation for rescheduling of delivery period.

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1 Other terms and conditions (Clause 17-27) is BALCO specific terms and conditions and is in addition to the Standard terms and conditions released as per the Corporate policy.
19. RELATIONSHIP BETWEEN THE SERVICE PROVIDER AND THE COMPANY

Personnel engaged/employed by the Service Provider shall be deemed employees of the Service Provider and will not for any purpose be considered employees or agents of the Company. Except as may otherwise be provided in this Contract, each Party shall be solely responsible for the supervision, daily direction, and control of its employees and payment of their salaries/wages, benefits, provision for amenities, compensation, disability benefits and the like.

20. SERVICE PROVIDER’S OBLIGATIONS/LIABILITIES

a) The sole responsibility of the performance of the sub-contractor rests with the Service Provider and the Service Provider shall be liable for any work done by its sub-contractor, agents, employees or officials. However, the Company reserves the right to claim damages and enforce rights on the sub-contractor solely or jointly with the Service Provider but such enforcement will not absolve the Service Provider from any liability.

b) The Service Provider shall advise the Company regarding, compliances, if any to be made by the Company.

c) The Company shall, without prejudice to its other rights be entitled to deduct/ adjust from any dues payable to the Service Provider or any security, all amount(s) which the Company may be liable to pay, incur or sustain as a result of the performance or non-performance, observance or non-observance of any of the terms of this Contract by the Service Provider.

21. SERVICE PROVIDER’S WARRANTIES & REPRESENTATIONS

a) The Service Provider hereby, warrants and represents that:

b) The Services under this Contract shall be strictly in accordance with the agreed terms.

c) The Services to be provided under this Contract shall not infringe any third party intellectual property rights.

d) The Service Provider hereby represents to the Company that, as of the date of signing of the Contract, the Service Provider has received no notification of any rightful patent infringement claim which would prejudice the Company’s right to use or maintain the Plant.

22. PENALTY FOR VIOLATION OF SAFETY MEASURES:

In case of any violation of safety measures and or on noncompliance of safety PPE by the Service Provider or his employee(s) BALCO may penalise the Service Provider as follows:

Rs 500/- First time
Rs 1000/- Second time onwards

If Service Provider continues failing to provide the safety &/ or PPE BALCO reserves its right to terminate the contract.

At any point of time safety compliance will be checked by BALCO’s SAFETY department or Execution Department. The Service Provider shall immediately upon knowing of any accident, damage or losses, in which he is involved on the site, should inform the area-in-charge.

The Service Provider shall take all safety precautions and provide adequate supervision by competent persons in order to do the job safely and without damage to plant, personnel, equipment, and the environment.

23. DISCIPLINE AT WORK AREA:

Service Provider has to maintain discipline at work area. He has to keep the area neat and...
clean after work is over. All the spares, waste material like oil grease etc. has to be kept at designated area and cleaned the work place after job is over.

In case, maintenance activities are found to be suffering due to non-performance by Service Provider’s employees or job negligence, then suitable punitive action will be taken by BALCO for the same.

24. EMERGENCY:

The Service Provider shall ensure that its workers follow the following instructions:

1. To contact fire control room on telephone No. 5333, 5219, 5393, 2333, 242033 and inform name, location and brief of the emergency. If telephone is not available, break the glass of nearest manual call point of fire alarm or use the nearby portable fire extinguisher if you know the operation of the extinguisher.
2. Rush to the location of Emergency and assess the situation. Combat the Emergency with the help of the available people using fire hydrant and fire extinguisher.
3. Rush to nearby assembly point [displayed in the department] in case of an extreme emergency.
4. As soon as any Emergency call, the Fire control room operator will immediately ask the Turn out no.1 available at Fire Station plant-I to rush at the emergency spot.
5. He will simultaneously inform to Main Security Gate of respective plants.

25. OCCUPATIONAL HEALTH & SAFETY (OH & S):

The Service Provider shall be responsible to take all precautions to ensure safety of the labours / workers at work. The Service Provider will supply his labours / workers safety equipment as per rules. If you are bringing your own equipment to carryout of job in side the plant such equipment should be subject hazard identifications and risk assessment prior to commencing of work.

The persons engaged by the Service Provider shall be given appropriate awareness on OH&S, those personal who will carry out jobs affecting OH&S shall be properly trained and made competent for the job performed by them. During emergency situation which may be faced in the plant your personal should move to the emergency shelters. They should not spread any rumour. (An OH &S booklet is available in Safety Deptt and is required to be signed by the Service Provider agreeing to comply with the same.

26. DAMAGE TO BALCO’S PROPERTY:

Any loss / damage to BALCO due to negligence or wilful attitude of the Service Provider or his employees while execution of the contract shall be recovered from the Service Provider’s pending bills.

27. VEDANTA SUSTAINABILITY CLAUSES

27.1 HEALTH, SAFETY AND ENVIRONMENT (HSE) SYSTEMS

Designation of Supervisor: The Service Provider 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 Service Provider: The Service Provider 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 Service Provider or its sub-Service Providers are present at the place of work.

Statutory Compliance: Service Provider 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.

Service Provider shall conduct internal inspections and record to ensure full implementation of requirements and compliance with the system at the site. Service Provider shall provide documentary evidence that it has complied with the system, on company’s demand.

Service Provider Site management plan: The Service Provider should comply to his submitted plan in his bid document on how to manage and improve the work site. The

27.2 HAZARD AND RISK ASSESSMENT

Pre and post Job Safety assessments: Service Provider 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, Service Provider 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

27.3 AWARENESS, COMPETENCY AND BEHAVIOR

Awareness: Before commencement of any Services, Service Provider shall at its own expense ensure that Service Provider’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, Service Provider shall emphasize the fact that each person has an obligation to stop an act or task if it is unsafe. Service Provider shall ensure that Service Provider’s Personnel attend refresher courses to maintain familiarity with current procedures. Service Provider shall provide evidence of completion of all training and competency assessments upon request by Company.

All Service Providers’ Personnel arriving on the site shall attend the Service Provider’s or Company’s HSE inductions including a review of the site’s safety procedures including Permit to Work and evacuation.
Service Provider 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 Service Provider 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 Service Provider should provide adequate guidance so that Service Provider’s personnel works to reduce workplace incidents and improve safe performance at all times. The Service Provider 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.

27.4 CHANGE MANAGEMENT

If there is a change in site supervisor and Service Provider management personnel, it shall be notified to designated Service Provider 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.

27.5 INCIDENT REPORTING

Reporting: Any accident, injury, near misses, fire, explosion, spill of chemicals, environment degradation etc involving Company or Service Provider’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; Service Provider shall provide Company with all reasonable assistance to allow & to complete its investigation.

Learnings: Service Provider shall implement the learnings from incident to prevent a recurrence. Service Provider must share lessons learned with Service Provider’s Personnel.

27.6 SAFETY INTERACTION

The Service Provider 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.

27.7 EMERGENCY DRILLS

Service Provider shall participate in emergency response drills to test the effectiveness of its emergency procedures and equipment and the knowledge and proficiency of Service Provider’s Personnel.

Service Provider will provide with their emergency response plan (ERP) which must be adoptable to suit the site.

27.8 CARDINAL RULE*

Service Provider shall ensure that all Service Providers’ Personnel follow the ten 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 Equipment (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 by the Service Provider to the concerned personnel and disciplinary action will be taken by the Service Provider which may result in suspension of personnel also.

27.9 PERSONAL PROTECTIVE EQUIPMENT

Service Provider shall, at its own expense, supply Service Provider'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.

Service Provider 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.

27.10 EQUIPMENT, TOOLS, TACKLES AND RESOURCES

Service Provider shall ensure that all plant, tools and equipment used by Service Provider'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.

Service Provider shall maintain a register of all lifting equipment and tackle. Service Provider 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. Service Provider shall ensure pre-inspection of lifting tools tackles including wire rope slings, clamps, shackles, hooks etc before taking up the job.

Company reserves the right to require, Service Provider 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.

Service Provider 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 Service Provider. 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 Service Provider, it will be made good at the risk and cost of Service Provider.

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.

TENDER DOCUMENT FOR OPERATION & MAINTENANCE OF POWER PLANTS
Vehicles operating in company premises shall observe all parking and speed restrictions, road signs and traffic rules as per company policy.

27.11 MATERIAL SAFETY DATA SHEETS

The Service Provider 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.

27.12 WORK PERMITS

Service Provider shall follow the site Permit to Work (PTW) system for carrying out hazardous activities that includes following (but not limited to) activities. The Service Provider 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

27.13 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.

Service Provider shall ensure that all Service Providers' 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. Service Provider's medical assessment process shall equal or exceed the requirements of Company's medical assessment procedure.

Service Provider 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.

27.14 DISEASE

Service Provider shall ensure that any of Service Provider'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.

27.15 HYGIENE AND HOUSEKEEPING

Service Provider shall ensure that Service Provider's Personnel maintain high standards of hygiene and housekeeping on the Site. Service Provider shall conduct routine hygiene and housekeeping inspections on the site to ensure that standards are maintained.
Service Provider 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.

27.16 ENVIRONMENT PROTECTION

Service Provider 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 of in compliance to law. Any oil/grease soaked cotton waste would be collected from site of work and suitably disposed as per the guidelines.

Service Provider shall use appropriate Personnel protective equipment’s and follow requisite procedure for handling, transportation and storage of Hazardous wastes inside the plant including disposal sites owned by company.

Service Provider shall be solely responsible for damage caused to the surrounding/environment during transit.

Service Provider 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. Service Provider shall be solely responsible for the legal actions that may be initiated consequent to environmental hazards as aforesaid. Service Provider would ensure that spillages, leakages and overflows etc are attended immediately on notice or on intimation.

27.17 SMOKING

Service Provider’s Personnel shall not smoke at the work site except within designated smoking areas.

27.18 SERVICE PROVIDER ACCOMODATION

Where the Service Provider’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.

27.19 CLEARANCE OF SITE

On a continuous basis consistent with Good Industry Practice during the progress of the Works the Service Provider shall clear away and remove pursuant to the directions of the BALCO from the Site all scrap, debris, other waste materials. The Service Provider shall, leave on the Site for the BALCO such temporary works as instructed by the BALCO, free of charge. The Service Provider 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 groundwater, for which other arrangements shall be made by the Service Provider) in accordance with Good Industry Practice.

27.20 REMOVAL OF UNSAFE WORKERS

The Service Provider shall document any identified instances of noncompliance with safety requirements by its workers and sub - Service Providers. Where any worker or sub Service Provider breaches safety requirements and thereby presents a threat of serious injury
or death to any person, the Service Provider shall remove that worker or sub Service Provider from the project site for the duration of the project.

27.21 SUBCONTRACTING

The Service Provider shall be able to demonstrate that he has applied selection procedures that ensure that his sub-Service Providers are demonstrably competent to perform the works safely. The Service Provider shall provide to the Location Manager the names of sub-Service Providers he intends to appoint in advance of entering into a contract with any such sub-Service Provider. 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-Service Providers by the Service Provider.

27.22 MONITORING

Compliance check by Service Provider: The Service Provider shall monitor his safety performance and that of his sub-Service Providers 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 Service Provider 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 Service Provider’s scorecard. The scorecard performance shall be reviewed periodically.

27.23 SERVICE PROVIDER QUERIES

The queries should be normally directed to company's designate as specified in contract. The site specific "Service Provider 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.

28. ENERGY MANAGEMENT SYSTEM CLAUSE:

Energy Management System Clause (for energy efficient products only such as motor, AC, Pumps, transformers etc.) As a part of Energy Management System (ISO 50001:2011), we wish to inform you that we intend to procure energy efficient products, equipment and services and you are requested to offer us energy efficient products, equipment & services which will have overall cost effectiveness. Your offer shall be evaluated partly on the basis of energy performance of your product, equipment or services throughout the entire life cycle of product. Hence, your offer should also include all the technical details related to energy use, consumption and efficiency and request you to inform us about the energy efficient products & specifications.