

INTRODUCTION

Orissa Power Generation Corporation Ltd. (OPGC) was incorporated as a wholly owned Government of Orissa Company on November 14, 1984 under the Companies Act. 1956. Government of Orissa as part of the reform process in the energy sector, had divested 49% of its share capital in favour of a strategic investor namely AES corporation, USA in the month of January, 1999.

The existing business activities of OPGC is confined to generation of 420 MW of electricity from its plant Ib Thermal Power Station (ITPS) located in the district of Jharsuguda. The two units of 210 MW each at ITPS are running successfully for last 12 years. The efficient operation and maintenance of these units have made OPGC a profitable and dividend paying company over the last decade.

Over the years, OPGC has achieved excellence in generation, environment, health & safety practices. OPGC today ranks among the top 15 thermal power plants in the country.

As part of its growth plan, OPGC has accorded top priority for the setting up of two more units 2x660 MW (Units- 3&4) at the same location. OPGC is also developing the captive coal block (Manoharpur & Dip side of Manoharpur) allocated to it in Ib Valley area for the expansion at ITPS.

While operating and expanding its facility at ITPS, OPGC is exploring the possibility of setting up of thermal power plant at 2nd location preferably in the district of Angul / Dhenkanal.

Further, the company is looking for development larger hydro electric plant as a part of a diversification of the existing source of electric generation only to meet the ambitious targets for power generation from hydro electric stations to ensure a proper mix up thermal to hydro generation at 60:40.

In addition, OPGC is also operating / reviving the seven mini hydel power plants totaling to 5075 KW. Three of these units namely Kendupatana (2x250 KW), Biribati (2x325 KW) & Andharibhangi (1x325 KW) are operating now. Balance four projects shall be revived in phases. In the 2nd phase the management decided to revive Badanala mini hydel project (2x325 KW). The project is in almost completion stage except some few modification works are required for smooth operation of the gates. The installed equipments are in good condition.

SCOPE OF WORK OF BADANALA MHP

Details of scope of work for overhauling, repairing, renovation, modification and supply of necessary items including erection, testing and successful commissioning of E & M Equipments for 2x325 KW of Badanala MHP, Orissa.

A) CIVIL WORK:

- 1) Repair, painting, replacement and fixing of glass panes in P.H.

B) ELECTRICAL WORK:

The Following electrical works to be done for each unit:

1. **GENERATOR:** A.C. induction type 325KW, 415V, 532Amps, 0.8P.f, 50Hz make Crompton Greaves (02 nos.)
 - (i) Dismantling of each part of Generator.
 - (ii) Cleaning Stator & Rotor.
 - (iii) Physical inspection of Stator & Rotor
 - (iv) IR & PI & winding resistance checking of Rotor & Stator.
 - (v) Varnishing of Stator & Rotor.
 - (vi) Drying of Stator & Rotor till achievement of IR & PI value.
 - (vii) High voltage & Die electric testing.
 - (viii) Checking of bearing, bearing housing & replacement if require.
 - (ix) Greasing of generator bearing.
 - (x) Re-assembly of Generator.
 - (xi) Alignment of Generator & Commissioning of Generator.

Repair / Rewinding of Stator & Rotor if necessary.

2. UNIT CONTROL BOARD (2 nos.):

For each units.

- (i) Checking of healthiness of panels & replacing of power & control cables if required.
- (ii) Checking of both power & control contractor, miniature relay and circuit breaker repair / replacement
- (iii) Replacement of all indication lamp by led lamps.
- (iv) Repair / replacement of temperature scanner.
- (v) Checking of auto synchronizer unit repair / replacement the same if require. -
- (vi) Testing and calibration of water level controller, Level monitor, Nivo meter, if found damaged then repair / replace.
- (vii) Replacement of all push bottom switch.
- (viii) Changing of Oil Pressure Unit (OPU) pump selector switch.
- (ix) Annunciation system to be checked and tested, if found damaged then repair/replace with suitable annunciation.
- (x) Commissioning of both panel.

3. GENERATOR & TRANSFORMER CONTROL PANEL (3 Nos.)

For each Units:

- (i) Checking of healthiness of panels & replacing of power & control cables if required.
- (ii) Testing of Air Circuit Breaker (ACB 800Amps EDO type),
- (iii) Checking of main contact, aux. contact & spring changing mechanism. Repair/replacement of the same.
- (iv) Repair / replacement of closing and tripping coil and spring charge motor.
- (v) Testing & calibration of all relay & meter in STL / any Govt. authorized Laboratory. On the basis of report repair / replacement of meters & relays.
- (vi) Replacement of all push bottom switch.
- (vii) Replacement of all indication lamp by led lamps.
- (viii) Repair / replacement of all selector switches.
- (ix) Erection of all meter. ACB, push bottom, relay etc. & other component in the panel.
- (x) Commissioning of both panels.

Checking and testing of CT & VT & replacement of damaged

4. BATTERY CHARGER (1 no. 110V, 60Ah)

- (i) Checking of panels & repairing of panels as per requirement.
- (ii) Through repairing, servicing to be done.
- (iii) Proper servicing, heat varnishing of transformer is to be done.
- (iv) Replacement of damaged control card.
- (v) Replacement of damage relay & fuse, contactor, switches
- (vi) Replacement indicating lamp, by led lamp.
- (vii) Proper wiring by new control wire of whole panels is to be done.
- (viii) Commissioning of the panel.

5. BATTERY (2V per cell- 55 nos., lead acid)

- (i) To be replaced by new battery with necessary link arrangement.
- (ii) Commissioning of the battery

6. AUXILIARY PANEL (1 no.)

- (i) Checking of healthiness of wiring & replacing of control & power cables if necessary.
- (ii) Checking of all components (125 Amps MCCB, Kwh meter, 32A MCB, 16A contactor, relay etc.) is to be servicing properly. Repair / replacement of damaged one.
- (iii) Replacement of Power & control fuses, indication lamp, push bottom switch.
- (iv) Commissioning of the panel.

7. MOTOR

- (i) Dismantling of each parts of the motor.
- (ii) Cleaning, varnishing & drying of Stator & Rotor.
- (iii) Checking of bearing & replacement of bearing if necessary.
- (iv) Reassembly of motor.
- (v) Measurement of IR & PI value of stator.

Rewinding of Stator & Rotor if necessary.

8. FIELD EQUIPMENT

- (i) Healthiness checking of each field equipment (solenoid valves, temp. sensor, pressure switch, flow switch, BTD & RTD. Repair / replacement of each of the field equipment if found damaged.

9. TRANSFORMER (1no – 1250 KVA, 415V/11KV, 50Hz):

- (i) Proper thorough servicing is to be done.
- (ii) Transformer oil has to be filtered if the result found unsatisfactory.
- (iii) Transformer oil has to be replaced by new oil if properties of the oil go below the limit value.
- (iv) Drying out of Transformer has to be done if PPM & BDB values of oil do not improve to its limit value after filtration of oil.
- (v) Silica gel has to be changed by new one with container.
- (vi) Required testing & calibration of oil temperature gauge, winding temperature gauge with Temperature sensor, Buchholz relay, oil gauge.
- (vii) All required test of TFR oil in STL / any other govt. recognized Laboratory has to be done before charging the transformer.

- (viii) All inter lock as well as protection checking has to be carried out before charging the transformer.

10. Minimum Oil Circuit Breaker (MOCB) (1no -11KV)

- (i) Overhauling of MOCB.
- (ii) Repairing of spring charging mechanism, closing and tripping mechanism.
- (iii) Checking and servicing of 230V AC motor if necessary then repaired.
- (iv) Testing and filtration of oil if the test results found unsatisfactory then replaced the oil by new one.
- (v) Checking, servicing, testing of all relays is to be done.
- (vi) All indication lamp is to be replaced by led one.
- (vii) Selector switch, meter – servicing testing is to be done, if found defective then replacement.
- (viii) Commissioning of the OCB.

11. 11KV ISOLATOR(1 set)

- (i) Dismantling of 11 KV Isolator.
- (ii) Proper alignment & servicing is to be done.
- (iii) Required 1 no insulator with female contact by supply one. As the make is not known it will be difficult to replace the insulator with female contact. So better to replace the Isolator.
- (iv) Proper erection is to be done.

12. LIGHTNING ARRESTOR WITH MONITOR (03 Nos.)

- (i) Replacement of LA monitor.
- (ii) Healthiness checking of LA.
- (iii) IR & Die electric measurement of LA.

13. 11KV HORN GAP FUSE(1set)

- (i) To be replaced by new one.
- (ii) New horn gap fuse to be erected

Replacement of spare parts to be done as per OEM / any other reputed manufactures which will be compatible with the system. The contractor will take prior approval of EIC before replacement of any spare.

C) MECHANICAL WORK:

1. Major overhauling of Turbine:

- (i) Disassembly of turbine.
- (ii) Cleaning & checking of each part of turbine.
- (iii) Repairing of the parts if necessary.
- (iv) Checking of shaft run out and coupling alignment, bearing bedding and oil clearance maintained, thrust pad bedding and float maintaining, linear realignment, turbine & Generator coupling reassembled testing and commissioning.

2. Major overhauling of runner, vanes: Runner disassembly, cleaned through alignment, checking, stress relieving, machining and leveling, reassembled, testing & commissioning.

3. Major overhauling of Pumps:

- (i) Overhauling with renewal of parts as required Renewal of Pumps.
- (ii) Checking of headliners of OPU system.
- 4. Repairing/ Overhauling of OPU system i/c. hydraulic regulating system etc. as necessary, testing of the system of servo motor.
- 5. Complete overhauling, servicing etc. greasing of bearing, complete reassembly of the same
- 6. Checking of bearing, techno-drive attachment etc necessary.
- 7. Repairing, servicing of Intake gate to make it operational including re placement of wire rope 16 MM - 360 Mt.
- 8. Cleaning of Approach inside the turbine basement is necessary.
- 9. Repairing of intake housing cover plate assembly.
- 10. Servicing, repairing of manual crane.
- 11. Supply and erection of 02 nos. Butterfly valves as per the diameter of the penstock pipe and also auto closing /opening mechanism of the valves.

D) STATUTORY REQUIREMENT

- i) Inspection fees of electrical equipments have to be submitted by the agency to Electrical Inspector Office on behalf of OPGCL before inspecting the equipments. The agency has to issue completion certificate after duly signed by contractor having HT license from ELBO.
- ii) Clearance certificate has to be obtained from Electrical Inspector before charging the unit.

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