

**Annexure 'II'**

**DETAILS OF FACTORY SERVICES WORK**

The detail of factory services work to be carried out by the contractor includes the following:

The job involves operation and maintenance of the following areas of the Factory services in ASSCP Gurgaon as per details given below.

**Job-Code-FS01:** Operation and maintenance of 250 ton capacity AC Plant. No. of work units: 3 (Highly Skilled- 1 unit (**FS01 (a)**), Semi Skilled- 2 units (**FS01 (b1)**, **FS01 (b2)**)).

**Job-Code-FS02:** Operation and maintenance of 7-8 Kg/cm<sup>2</sup>-150 CFM Compressed air system. No. of work units: 1 (Skilled- 1 unit).

**Job-Code-FS03:** Operation and maintenance of Raw and potable water supply. No. of work units: 1 (Skilled- 1 unit).

**Job-Code-FS04:** Operation and maintenance of Soft water and DM water plant. No. of work units: 1 (Skilled- 1 unit).

**Job-Code-FS05:** Operation and maintenance of 500/125 KVA DG sets. No. of work units: 1 (Skilled- 1 unit).

**Job-Code-FS06:** Operation and maintenance of Fire alarm system, PA and Telecomm system. No. of work units: 1 (Highly Skilled- 1 unit).

**Job-Code-FS07:** Operation and maintenance of HT/LT Electrical Substation. No. Of work units: 1 (Skilled- 1 unit).

**Job-Code-FS08:** Electrical Maintenance of Buildings. No. of work units: 2 (Skilled- 2 unit (**FS08 (a1)**, **FS08 (a2)**)).

**Job-Code-FS09:** Minor Civil Maintenance of Buildings. No. Of work units: 1 (Skilled- 1 unit).

**Job-Code-FS01**

**Title:** Operation and maintenance of 250 ton capacity AC Plant

**Nature of Work-**

a) Maintenance: Highly Skilled- 1 unit (**FS01 (a)**) Haryana Min. Wages Cir Dt. 13.02.2015 Sl.No 4

b). Operation: Semi Skilled- 2 units (**FS01 (b1), FS01 (b2)**) Haryana Min. Wages Cir Dt. 13.02.2015 Sl.No 2A

**No. Of work units:** 3

**Description:** The Job comprises of operation and maintenance of a 250 tonnes capacity AC plant with following details.

**Job-Code-FS01 specifications**

Central Air conditioning plant of 250 ton chilled water capacity comprising

- Two nos. 100 ton chilled water units
- One Nos. 50 Ton Capacity chilled water unit
- 5 Nos. 50 Ton Trane make model E Horizontal type AC compressors
- 3 nos. 15hp chilled water pumps
- 3 nos. 20hp condensed water pumps
- 3 nos. Paharpur make Cooling towers
- 2 Nos. 50hp AHU's for PO with filters for dust and humidity controls
- 10 Nos. 3-10hp AHU's for other areas
- 200 KW Heaters

**Activities involved in Operation and Maintenance of Job-Code-FS01**

- a) Operation of AC plant of capacity 250 ton-**daily**.
- b) Maintaining of designed parameters i.e. temperature at 23-25 degree celcius, in all air conditioned areas and dust level <100000 in Process area etc., -**daily**.
- c) Maintaining operating parameters i.e. suction, discharge and standing pressure of Refrigerant gas, chilled water pressure, condensed water temperature, pressure, oil pressure leak test etc. etc.-**daily**
- d) Maintaining predetermined temperature and pressure of chilled water (10-15 degree celcius) to all equipments-**daily**.
- e) Checking of water level in cooling towers and expansion tanks etc-**daily**..
- f) Check voltage, current etc of electrical supply in AC plant, preventive maintenance of all AC electrical panels and inform the concerned BHEL personnel about the shortfalls-**daily**.
- g) Cleaning of all filters, cooling towers, strainers, condensers, chillers and cooling coils etc-**monthly**.
- h) To keep all equipments and instruments in clean and healthy condition.
- i) To perform leak checks, check for any loose fastenings, to ensure smooth operation of plant-**daily**.
- j) Filling / topping up of refrigerant, oil, etc., in AC compressors as and when required.
- k) To carry out repairs and overhauling of the plant to avoid breakdowns-**daily**.
- l) Filing of log books –**daily**..
- m) Maintaining the AC plant in working condition.
- n) Any other activity necessary for O & M of AC services.

**Job-Code-FS02**

**Title:** Operation and maintenance of 7-8 Kg/cm<sup>2</sup>-150 cfm Compressed air system

**Nature of Work-**Operation and Maintenance: Skilled-1 unit, Haryana Min. Wages Cir Dt. 13.02.2015 Sl.No 3A

**No. Of work units:** 1

**Description:** The Job comprises of operation and maintenance of a 7-8 Kg/cm<sup>2</sup>-150 cfm Compressed air system with following details.

**Job-Code-FS02 Specifications**

- Compressed air system comprising:
- Two Nos. Non lubricated type water cooled vertical Air compressors of Ingersoll Rand make with air dryers of 150cfm/8kg/35kw capacity/load
- Compressed air lines till the point of use.

**Activities involved in Operation and Maintenance of Job-Code-FS02**

- a) Operation of Air compressor system and associated cooling water system as per required specifications at desired pressure 6-8 kg/cm<sup>2</sup> and flow 150 cfm-**daily**.
- b) Ensuring proper distribution of plant output to the point of use-**daily**.
- c) Preventive and breakdown maintenance – as and when required.
- d) Proper housekeeping in and around the plant-**daily**.
- e) Proper maintenance of logbook and highlighting pressure and quality compressed air supply to all pneumatic equipments-**daily**.
- f) Maintenance of regular specified pressure and quality compressed air supply to all pneumatic equipments-**daily**.
- g) Ensuring sustained and uninterrupted services of the compressed air supply, O & M of air compressors and accessories and to take corrective action before breakdown occurs-**daily**.
- h) Keeping the compressor / equipment / accessories free from malfunctioning / faults and ready for operation-**daily**.
- i) Any other activity necessary for O & M of Compressed air system.
- j) Filing of log books-**hourly**

**Job-Code-FS03.**

**Title:** Operation and maintenance of Raw and potable water supply

**Nature of Work-**Operation and Maintenance: Skilled-1 unit, Haryana Min. Wages Cir Dt. 13.02.2015 Sl.No 3A

**No. Of work units:** 1

**Description:** The Job comprises of operation and maintenance of a Raw water and potable water supply system with following details.

**Job-Code-FS03 Specifications**

Raw water and potable water supply system comprising:

- Three nos. bore wells with KSB make submersible pumps of 5-8 hp/440V capacity.
- One no. under ground sump.
- One no. over head tank of 80000 liters capacity.
- Two nos. water filter of 5 m<sup>3</sup> capacity and pumps.
- Valves and taps at the point of use and in between for pressure/flow control
- Water lines till the point of use.

**Activities involved in Operation and Maintenance of Job-Code-FS03**

Raw/potable Water Plant Supply and Maintenance comprising

- a) Filing of log books for the activities carried out—**hourly**
- b) Monitoring of the Plant and raw water quality, pressure, flow etc-daily**
- c) Water treatment of the drinking water (Every **alternate day at the present raw water quality**).
- d) Maintenance of pumps including oiling and greasing —**bi annual**
- e) Maintenance of filters for removal of suspended and other impurities —annual**
- f) Cleaning of UG sump for catering to the raw water requirement of the plant-bi annual**
- g) Provision of water supply to all the requirements within the premises of the plant -daily**
- h) Repair of water supply lines , gate valves etc. (as and when required)

**Job-Code-FS04**

**Title:** Operation and maintenance of Soft and DM water plant

**Nature of Work**-Operation and Maintenance: Skilled-1 unit, Haryana Min. Wages Cir Dt. 13.02.2015 Sl.No 3A

**No. Of work units:** 1

**Description:** The Job comprises of operation and maintenance of a Soft and DM water supply system with following details.

**Job-Code-FS04 Specifications**

Soft and DM water supply system comprising:

- 5 m<sup>3</sup> capacity two nos. water softening units.
- One no. over head tank of 80000 litres capacity.
- Valves and taps at the point of use and in between for pressure/flow control
- Water lines till the point of use.

**Activities involved in Operation and Maintenance of Job-Code-FS04**

For Soft water

- a) Operation of the Plant for provision of continuous service for process –**daily**
- b) Monitoring of the Plant and soft water quality, pressure, flow etc. –**daily**
- c) Regeneration of the plant with NaCl as and when required
- d) Maintenance of pumps including oiling and greasing **bi annual**
- e) Filing of log books-**hourly**

For DM water

- a) Operation of the Plant for provision of continuous service for process to PO –**daily**
- b) Monitoring of the Plant and DM water quality, pressure, flow etc. –**daily**
- c) Regeneration of the plant with HCL/NaOH (Every **10-15 days** for approx. 15,000 liters of water consumed at the present raw water quality).
- d) Calibration of Conductivity meters **monthly**
- e) Maintenance of pumps including oiling and greasing every **bi annual**
- f) Checking of leakages –**daily**
- g) Repair as and when required
- h) Filing of log books –**hourly**

**Job-Code-FS05**

**Title:** Operation and maintenance of 500KVA & 125KVA DG sets

**Nature of Work-**Operation and Maintenance: Skilled-1 unit, Haryana Min. Wages Cir Dt. 13.02.2015 Sl.No 3A

**No. Of work units:** 1

**Description:** The Job comprises of operation and maintenance of a of 500KVA & 125KVA DG sets with following details.

**Job-Code-FS05 specifications**

Two nos. DG sets with following details:

- One no. 125 KVA/440 V/3 phase DG set and 500 KVA/440 V/3 phase DG set of Cummins make.
- Two no. AMF panel for the distribution of supply.
- Three no. tanks for the storage of HSD
- One no. 10 KL supply system for storage and supply of HSD.
- Four no. 12V/180 AH LMLA batteries.

**Activities involved in Operation and Maintenance of Job-Code-FS05**

Repair and maintenance of AMF DG Sets at ASSCP consisting of

- a) Daily check of the health of DG sets/Panels Alternators, batteries, relays, contactors, timers, fuses etc.
- b) Daily check of level of diesel and Control of fuel consumption
- c) B- check after every 250 hours of operation
- d) C-check after every 1500 hours of operation
- e) D-check after every 4500 hours of operation
- f) Maintenance of AMF panel as and when required.
- g) Filing of log books-hourly**

**Job-Code-FS06**

**Title:** Operation and maintenance of Fire safety system, PA and Telecomm system

**Nature of Work-**Operation and Maintenance: Highly Skilled-1 unit, Haryana Min. Wages Cir Dt. 13.02.2015 SI.No 4

**No. Of work units:** 1

**Description:** The Job comprises of operation and maintenance of

1. A conventional Fire Safety system.
2. A Philips make PA system.
3. Telecomm system.

**Job-Code-FS06 specifications**

- a) The Fire Alarm system comprises of:
  - 24V Vijay Fire Make fire Alarm system with 150 Smoke detectors
  - Fire Hydrant System of 3000lpm capacity with two nos. 80hp and 16hp pumps and UG Fire Tank catering to these pumps
2. The PA system comprises of:
  - 70-110V Philips India Make PA system
    - Two nos. 250 W amplifiers coupled with each other.
    - 50 nos. speakers installed at various critical places.
    - Volume controls for speakers.
    - Two nos. 2 in 1 of Philips make.
    - Two nos. microphones with amplifiers.
  - b) The Telecomm system comprises of:
    - 40 nos. instruments/telephone handsets installed at various places.
    - 4 nos. LMLA battery with charge controller.
    - One no. console and call monitoring system
    - MDF and distribution panels with cabling till point of use.

**Activities involved in Operation and Maintenance of Job-Code-FS06**

Repair and maintenance of Fire safety system at ASSCP consisting of

- a) **Daily** check of the health of Fire alarm system/Panels batteries, relays, contactors, timers, fuses etc.
- b) **Daily** check of fault indication.
- c) Rectification of faults on **daily** basis.
- d) Repair of cards and other components.
- e) Testing of system on **daily** basis.
- f) Cleaning of detectors on **daily/weekly** basis as per requirement.
- g) Auto operation of Fire pumps.-**daily**
- h) Testing of water supply points.-**daily**
- i) Repair of system as and when required.
- j) Filing of log books-**hourly**.

Repair and maintenance of PA system at ASSCP consisting of

- a) Daily check of the health of PA system/amplifiers 2 in one, mic. Speaker's volume controls etc.
- b) Daily check of fault indication.
- c) Rectification of faults on daily basis.
- d) Repair of volume control, speakers etc. and other components.
- e) Testing of system on daily basis.
- f) Cleaning of system on daily/weekly basis as per requirement.
- g) Repair of system as and when required.
- h) Filing of log books-**hourly**

And Repair and maintenance of telecomm system at ASSCP consisting of

- a) **Daily** check of the health of telecomm system
  - b) **Daily** check of fault indication.
  - c) Rectification of faults on **daily** basis.
  - d) Repair of cards and handsets-**daily**
  - e) Testing of system -**daily**.
  - f) Cleaning of system on **daily/weekly** basis as per requirement.
  - g) Repair of system as and when required.
- Filing of log books-**hourly**

**Job-Code-FS07**

**Title:** Operation and maintenance of HT/LT Electrical Substation

**Nature of Work-**Operation and Maintenance: Skilled- 1 unit, Haryana Min. Wages Cir Dt. 13.02.2015 Sl.No 3A

**No. Of work units:** 1

**Description:** The Job comprises of operation and maintenance of Electrical substation area having HT as well LT panels and equipments.

**Job-Code-FS07specifications**

The Electrical substation comprises of

- Two Nos. 11KV/440V-800KVA Crompton Greaves make Transformers
- Electrical Substation for distribution of 1649 KW load
- HT/LT panels, breakers, capacitor banks etc.

**Activities involved in Operation and Maintenance of Job-Code-FS07**

- c) Operation upkeep and maintenance of transformers comprising
1. Fortnightly dehydration of silica gel of transformers
  2. Demoisterization of transformer oil every alternate year
  3. Filtration of O.C.B. oil every alternate year
  4. Maintenance of Voltage/PF within Limits-**daily**
  5. Breakdown Maintenance
  6. Safe operation of transformers and panels-**daily**
  7. Checking of system safety-**daily**
- d) Repair and operation and Maintenance of capacitor bank consisting of
- i. **Daily** check and maintenance of required power factor
  - ii. Repair and maintenance of the power factor controller ( as and when required)
- e) Operation and maintenance of LT/HT Panels comprising of
- i. OCB's/VCB's/ACB's of various Capacities viz. 1250A ACB for LT and 150 A VCB for HT 2500A/1600A bus couplers etc.
  - ii. Change over switches and MCCB's upto 800A capacities
  - iii. DG Breakers up to 1000A capacities
- d) Power Factor control equipment with 8 capacitor banks of 200KW each capacity (2 nos.)
- e) Any other work in substation area- **daily**
- f) Filing of log book-**hourly**

### **Job-Code-FS08**

**Title:** Electrical Maintenance of Buildings

**Nature of Work-**Operation and Maintenance: Skilled- 2 units (**FS08 (a1), FS08 (a2)**)  
Haryana Min. Wages Cir Dt. 13.02.2015 SI.No 3A

**No. Of work units:** 2

**Description:** The Job comprises of Electrical maintenance of buildings like switches, tube lights, bulbs, fixtures, Power points etc. as per enclosed details.

### **Job-Code-FS08 specifications**

The Electrical maintenance of building comprises of

- A connected load of 1649 KW.
- Points, MCBs, Lighting loads, fans, coolers, Street lights, (complete building load connected as per enclosed details) Motors and starters of various types and capacities
- All electrical equipments

### **Activities involved in Operation and Maintenance of Job-Code-FS08**

- a) Upkeep and maintenance of all electrical points comprising
  - i. Attending to complaints-**daily**
  - ii. Replacement of faulty lights, points-**daily**
  - iii. Repair of coolers, fans and other items-**daily**.
  - iv. Repairing and new cabling within the premises.-**daily**
  - v. Repair/replacement of MCBs , street lights-**daily**
  - vi. Checking of loose connection and their removal-**daily**
  - vii. Any other electrical upkeep and maintenance work-**daily**
  - viii. Filing of log book/complaint register-**daily**

**Job-Code-FS09.**

**Title:** Minor civil Maintenance of Buildings

**Nature of Work-Operation and Maintenance:** Skilled, Haryana Min. Wages Cir Dt. 13.02.2015 Sl.No 3A

**No. Of work units:** 1

**Description:** The Job-Code comprises of minor civil maintenance of buildings like checking water seepages, falling stones, floor grinding, painting, preparation of estimates, engagement of labour for civil works, overseeing labour work etc.

**Job-Code-FS09 specifications and activities**

The minor civil maintenance of building comprises of

- Checking and stopping minor seepages in buildings.
- Minor repair of buildings like floor grinding, painting etc. through engagement of proper labour etc.
- Overseeing repair work.
- Filing of log book/complaint register-**daily**

**MEASUREMENT OF WORK AND PAYMENT THEREOF IN RESPECT OF FACTORY SERVICES JOBS**

1. A Log book with hourly entries of work carried out under each job will be maintained in the Unit by the qualified person engaged by the contractor and checked by authorized representative of BHEL who shall make entries regarding the work executed by the contractor under different heads.
2. Short comings, if any, in the work executed by the contractor will be pointed out by the designated employee to the Contractor or his authorized representative and the same will be rectified by him within specified time (Unit to indicate time) to the satisfaction of the designated employee.
3. Payment towards work satisfactorily executed will be made to the Contractor against monthly bill submitted by the contractor based on the no. of units executed, multiplied by the rate/unit for each job.
4. All payments will be subject to deduction of income tax at source as per Income Tax and Service Tax as per the applicable Rules.

**Log Book format to be maintained by the contractor (Factory Services)**

Month: \_\_\_\_\_

<b>Job Code*</b>	<b>No. of days in the month</b>	<b>No. of Days the job was executed</b>	<b>Job Satisfactorily executed – Y / N</b>	<b>Sign of Contractor</b>	<b>Sign of BHEL representative</b>
FS01(a)					
FS01(b1)					
FS01(b2)					
FS02					
FS03					
FS04					
FS05					
FS06					
FS07					
FS08(a1)					
FS08(a2)					
FS09					

\* attach work / area description sheet with this format