

ANNEX A: TERMS OF REFERENCE

PROVISION OF GENERATOR SPARE PARTS AND MAINTENANCE SERVICES FOR UNHCR SUB OFFICE IN MADIGURI, BORNO STATE- NIGERIA

GENERAL INFORMATION:

UNHCR Sub Office Maiduguri located in Borno State, Nigeria requires professional service providers and contractors to submit proposals for supply of generators parts and to perform preventive corrective maintenance services of it's generators assets located in UNHCR Sub Office in Maiduguri, warehouse, guest house and UNHCR Field Office in Yola – Nigeria.

SCOPE OF WORK - GENERATOR PREVENTIVE/CORRECTIVE MAINTENANCE

The contractor will be responsible for labor and materials required to carry out all preventive and corrective maintenance as outlined in this TORs as well as supply of spare parts listed in **Annex D**

The contractor shall provide all materials, supervision, labor, tools, and equipment to perform preventive maintenance. All personnel working in the vicinity shall wear and /or use safety protection. while work is performed.

For emergency service, repair or maintenance, the contractor will respond within 6 hours after notification from the UNHCR Focal Point.

At a minimum, the following work must be completed:

Notes:

- Contractor must submit to the Contract Manager for review, work sheet/checklist that will be used for performing maintenance service.
- Contract Manager must immediately be made aware of any condition discovered that could result in equipment failure.
- Test and inspection report shall be submitted to the Contract Manager within three days of completing work.
- Laboratory report for all chemicals (oil, coolant, or fuel analysis) shall be submitted to the Contract Manager.
- Maintenance Interval Schedule
- (Standby Generators)

A. Bi- Monthly Schedule SERVICE LEVEL 1

1. Conduct visual inspection around generator

- Check for evidence of leaks, damage, loose or missing hardware.
- Inspect engine and generator wiring harness for wear and damages.
- Inspect supports and spring isolators for soundness and stability.

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- Inspect unit for corrosion.
- Hoses and Clamps - Inspect/Replace if needed.
- Belts - Inspect/Adjust/Replace if needed.
- Inspect all fuel, oil, and water piping for secure mounting.
- Inspect exhaust piping and muffler insulation.

2. Batteries.

- Battery charger – Inspect operation and clean.
- Battery electrolyte level and specific gravity – Check and adjust. Add distilled water as needed.
- Perform battery load test.
- Clean battery terminals and lugs (apply grease on terminal connections).

3. Fluids and Filters.

- Cooling System Coolant Level - Check and adjust.
- Check coolant percentage and freeze protection. (Refractometer)
- Jacket Water Heater - Check proper operation.
- Engine Oil Level - Check and add if needed.
- Engine Air Cleaner Service Indicator – Check, clean filter if needed.

4. Generator Room.

- Fuel tanks – Inspect and treat fuel if needed, check fuel level, drain water and sediment.
- Automatic fuel system -Check operation and control panel.
- Air intake/exhaust – Ensure nothing obstructs airflow; louvers are free and operate properly.
- Exhaust condensate trap – drain condensate.

5. Control Panel.

- Electrical Connections - Check tightness
- Clean and remove dust from panel (inside and out of cabinet).

6. ATS.

- Clean and remove dust (inside and out of cabinet).
- Inspect seals.
- Note date of last battery change. (Replace if 2 years or older).

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- Tighten connections on control panels and main power cable lugs.
- Check for hot spots.

7. Run unit – No load.

- Run the generator with no load for 15 minutes.
- Remote Start Panel-Inspect and test operation. Inspect and clean.
- Check the generator for unusual conditions, such as: excessive vibration, leaks,
- Excessive smoke and abnormal noise.
- Verify all gauges and indicators are normal and functioning properly.
- Check all indication lights, replace any defective bulbs.

8. Start unit and run under load for 1 hour.

- Note: Unit should be run under facility load if permissible. If not, unit should be run with a minimum 80% load with load bank.
- Automatic Start/Stop – Inspect.
- Check ATS operations and calibrate if necessary.
- Observe and record engine start, transfer and retransfer/cool down time.
- Generator Set Vibration – Inspect.
- Read and record all gauges/meters.
- Record load readings – Voltage, amps, frequency, power factor, KW and % load.
- Check exhaust for excessive black or white smoke.
- Check turbocharger for vibrations or any abnormal noise during operation.
- Check generator bearing for noise and overheating.
- Check exhaust manifold, muffler, and piping for leaks and secure mountings.

9. Additional.

- Ensure Generator/ATS is left in proper position for automatic start and transfer.
- Clean generator and generator room. Wash radiator if necessary.
- Annotate date, hours and maintenance in Generator log, fill out maintenance checklist and report deficiencies to Contract Manager
- Perform any additional maintenance tasks as recommended in the manufacture's operation and maintenance manuals.
- Submit Service Inspection and Test Report to the Contract Manager.

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10. Perform computer-aided service diagnostic test by a qualified technician (all engines)

- Use appropriate diagnostic tool
- Must be able to identify engine problem
- Override Power Wizard level three passwords
- Configure and/or change system parameters, as required
- Display, graph and record logs of parameter status
- Display the status of a group of parameters (temperatures, pressures, etc)
- View and clear active and logged diagnostic codes
- View and clear active and logged event codes
- Display, view or change the current Configuration File or Base level Flash File
- Upload, download and save configuration files
- View a list of irregularities logged by the ECM (engine control module)
- Perform diagnostic tests
- Perform calibrations as necessary
- Print reports and diagnostic results. Submit to Contract Manager after each inspections.

B. Quarterly Schedule SERVICE LEVEL II

- 1) Conduct Semi-Annual PM service
- 2) Engine Air Cleaner Elements – Replace.
- 3) Engine Crankcase Breather – Clean.
- 4) Engine Oil Sample - Obtain and perform analysis. Submit report to COR.
- 5) Engine Oil and Filter – Replace.
- 6) Fuel Filters and Water Separators – Replace.
- 7) Obtain fuel sample at day tank and storage tank for analysis.
- 8) Radiator – Clean (pressure wash).
- 9) Intake louvers and ducts – Inspect/Clean (pressure wash).
- 10) Fan Drive Bearing – Lubricate.
- 11) Magnetic Pickups - Clean/Inspect.
- 12) Cooling System Coolant Sample - Obtain
- 13) Cooling System Supplemental Coolant Additive (SCA) - Test/Add
- 14) Coolant filter – Change if applicable
- 15) Crankshaft Vibration Damper - Inspect
- 16) Engine Protective Devices - Check
- 17) Engine Valve Lash - Inspect/Adjust
- 18) Turbocharger – Inspect/Check, Check end play and radial clearance on the turbine wheel and shaft.

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- 19) Clean and lubricate fuel pump linkages if applicable.
- 20) Fan bearing – Inspect/Grease.
- 21) Clean dust and vacuum all the controls, meters, switching mechanism components, interior buswork, Remote Start control panel, Annunciator and connecting lugs of the ATS.
- 22) Inspect/Check buswork and supporting hardware for carbon tracking, cracks, corrosion, or any type of deterioration on ATS.
- 23) Check all control wiring and power cables (especially wiring between or near hinged door) for sign of wear and deterioration on ATS.
- 24) Check the cabinet interior for loose hardware – tighten connections.

C. Annual Maintenance Schedule SERVICE LEVEL III

- 1) Conduct assessment and maintenance visits after every 2months to service the generators with an estimated annual number of visits totaling 6 times per year.
- 2) Inspect water pump and seals; replace any worn or defective parts.
- 3) Clean and inspect the oil cooler.
- 4) Clean and inspect the after cooler.
- 5) Generator, Check for moisture, dust, oil,grease,debris on main stator windings.
- 6) Clean as needed.
- 7) Generator bearing – Inspect/Grease (or as recommended by manufacturer).
- 8) Cooling System Coolant – Flush system and replace coolant (Note CAT ELC coolant to be replaced every 12,000 hrs or 6 years).
- 9) Cooling System thermostat – Replace
- 10) Belts and hoses – Replace
- 11) Batteries - Replace
- 12) Generator Main Stator Winding Temperature (if equipped with winding defectors)
- 13) Check and record main stator winding temperatures with engine under load.

D. Emergency Response

Provide UNHCR with an Emergency Contact and Telephone Number where Contractor can be reached twenty-four (24) hours per day.

When utilizing an answering service, Contractor's personnel shall respond within one (1) hour.

Bidders should note that the technical evaluation criteria document is an integral part of the scope of work. Proposals must be responsive to the technical evaluation criteria document as well as the scope of work.

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Safety.

To ensure safe site operations, measures to be adopted to prevent damage to properties or utilities and injuries to persons. UNHCR shall not be liable for loss or damage resulting from its failures to take the necessary precautions. The provision of all personal protective equipment shall be the responsibility of the Contractor.

Weekly visits in 8th week: We proposed an estimated visits every 2 months to assess the status of generator per location and drafting of a maintenance schedule per genset.