

SCOPE OF WORK
FOR
CUMMINS ELECTRIC GENERATORS
MONTHLY MAINTENANCE

U.S. EMBASSY
Sofia, Bulgaria

January 2021

**Embassy Generators Preventive Maintenance (BME)
Scope of Work**

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Embassy Generators Preventive Maintenance (BME)

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I. GENERAL INFORMATION

1. The United States Embassy in Sofia, Bulgaria, requires professional services and contractor cost proposals to perform preventive maintenance services of the facility's standby generator systems.

II. PROJECT REQUIREMENTS

The Contractor shall perform preventive maintenance as described in this STATEMENT OF WORK. The objective of scheduled preventive maintenance is to eliminate system malfunction, breakdown, and deterioration when units are activated/running.

There are (3) Generators manufactured by Cummins Company, Series 2100, of which (2) Model DFLC-1000, Output 1250KVA, & (1) DFCB – 275, Output 300KVA, working on Diesel. The two bigger ones are in the Warehouse of the Embassy, and the smaller – in the Chancery Lower Level, at Kozyak Street 16 in the City of Sofia.

III. GENERAL REQUIREMENTS

The contractor shall provide the labor and materials required to carry out all preventive maintenance as outlined in this SOW. Embassy staff have service manuals for Generators on-site. The contractor shall confirm on-site manuals are complete and current and provide the Contracting Officer's Representative (COR) a listing of any missing or out of date manuals.

IV. SCOPE OF WORK – GENERATOR PREVENTIVE MAINTENANCE

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 appropriate safety protection while work is performed. Any questions or injuries shall be brought to the attention of the Post COR and Occupation Safety and Health Officer (OSHO). Material Safety Data Sheets (MSDS) shall be provided by the contractor for all HAZMAT materials. Copies will be provided to the COR for approval.

The systems and components to be maintained include diesel generator prime mover, alternator, fuel, cooling, ventilation and lubrication systems, start and transfer systems, as well as control and monitoring systems. The attached equipment list provides details.

1. The contractor shall provide the COR with a list of necessary parts and materials.
2. Oil, fluids, filters, and preventive maintenance parts shall be provided at the expense of the U.S. Govt.
 - a. Only fluids which meet or exceed manufacturer's specifications shall be used.

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- b. All fluids shall be delivered in original sealed containers.
3. The contractor shall provide emergency assistance for generator support, priced at an hourly rate, within 24 hours of being contacted by the COR.
4. The Government will not provide load banks for generator testing.

If any discrepancies are found with the generator systems that are not covered under this scope of work, the contractor shall provide the following:

1. Detailed report noting the discrepancy found.
2. Bill of Materials (BOM) to include component name, quantity, part #, and price for any repair material required and material lead time.
3. Price quote for repair labor.

SAFETY & SPECIAL INSTRUCTIONS:

1. Use appropriate personal protective equipment (PPE) when performing work
2. Check all work areas, tools, and equipment to ensure unsafe conditions are eliminated or guarded against.
3. Follow site safety procedures.
4. Schedule maintenance with operating personnel and affected offices (security).
5. Follow approved lockout/tag out procedures.
6. Lockout and disconnect the main power before tightening the main supply lugs in order to avoid the hazard of electrical shock, which could result in serious personal injury or death.
7. Review and follow the manufacturer's instructions.
8. Record results in the equipment history log.
9. Remove lockout/tag out in accordance with appropriate procedures.
10. Report all incidents and near miss incidents to COR and assist as requested in the investigation and corrective action.

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The purpose of this Statement of Work is to ensure the entire standby generator systems for this facility are maintained according to manufacturer's recommendations to ensure the readiness and proper operation of the system.

A) MONTHLY SCHEDULE

1. When on site for monthly maintenance inspection, do following as requested by the Cummins Generator Manufacturer:
 - 1.1 Do monthly general Gen Set inspection.
 - 1.2 Check monthly the generator coolant heater.
 - 1.3 Check monthly the oil level.
 - 1.4 Check monthly the coolant level.
 - 1.5 Check monthly the fuel level.
 - 1.6 Check monthly the charge air piping.
 - 1.7 Check air cleaner and clean if required.
 - 1.8 Drain water and sediment from fuel tank.
 - 1.9 Drain exhaust condensate trap.
 - 1.10 Check starting batteries.
 - 1.11 Change air cleaner element.
 - 1.12 Check radiator hoses for wear and cracks.
 - 1.13 Test generator insulation resistance.
 - 1.14 Drain fuel filter.
 - 1.15 Check Anti-Freeze and DCA concentration.
 - 1.16 Change annually crankcase oil and filter.
 - 1.17 Check drive belt tension.
 - 1.18 Change coolant filter as required by the Manufacturer.

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1.19 Clean crankcase breather.

1.20 Change annually fuel filters.

1.21 Clean annually cooling system.

B) SEMI-ANNUAL SCHEDULE

2.1 Conduct visual inspection around generator.

2.2 Check for evidence of leaks, damage, loose or missing hardware.

2.3 Inspect engine and generator wiring harness for wear and damage.

2.4 Inspect supports and spring isolators for soundness and stability.

2.5 Inspect system for corrosion.

2.6 Hoses and Clamps – Inspect and replace if needed.

2.7 Belts – Inspect and adjust/replace if needed.

2.8 Inspect all fuel, oil, and water piping for secure mounting and leaks.

2.9 Inspect exhaust piping and muffler insulation.

2.10 Check / service air cleaner.

3. Batteries.

3.1 Battery charger – Inspect operation and clean.

3.2 Battery electrolyte level and specific gravity – Check and adjust. Add distilled water as needed.

3.3 Perform battery load test.

3.4 Clean battery terminals and lugs (apply grease on terminal connections).

4. Fluids and Filters.

4.1 Cooling System Coolant Level - Check and adjust.

4.2 Coolant conditioner (DCA/SCA) / Antifreeze protection – Check and adjust to specs.

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- 4.3 Jacket Water Heater - Check proper operation.
- 4.4 Water pump - Check
- 4.5 Engine Oil Level - Check and add if needed.
- 4.6 Fuel/water separators – Drain water.
- 4.7 Engine Air Cleaner Service Indicator – Check, replace filter if needed.
- 5. Generator Room.
- 6. Check hoses, piping, and connections
 - 6.1 Water which permits the growth of fungus and bacteria.
 - 6.2 Exposure to temperatures greater than 30°C (85°F).
 - 6.3 Contact with zinc or copper.
 - 6.4 Poor original fuel quality.
 - 6.5 Exposure to dirt and other contaminants.]
 - 6.6 Space Heater/Room exhaust fan - Check for proper operation.
 - 6.7 Air intake/exhaust – Ensure nothing obstructs airflow; louvers are free and operate properly.
- 7. Control Panel/generator cabinet.
 - 7.1 Open all cabinets; remove panel covers to clean/inspect.
 - 7.2 Clean dust and vacuum all the controls, meters, switching mechanism components, interior buswork, Remote Start control panel, Annunciator and connecting lugs. Inspect/Check buswork and supporting hardware for carbon tracking, cracks, corrosion, or any type of deterioration.
 - 7.3 Check all control wiring and power cables (especially wiring between or near hinged door) for sign of wear and deterioration.
 - 7.4 Check the cabinet interior for loose hardware – tighten connections.
 - 7.5 Electrical Connections - Check tightness

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7.6 Clean and remove dust from panels.

8. Run unit – No load.

8.1 Run the generator with no load for 10 minutes.

Check the generator for unusual conditions, such as: excessive vibration, leaks, smoke.

§ Verify all gauges and indicators are normal and functioning properly.

§ Check all indication lights, replace any defective bulbs.

§ Check operation of safeties & alarms

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

8.1 Unit should be run under facility load if COR authorizes to test and exercise entire system.

8.2 If facility load is not permissible or is not a minimum of 50% of rated capacity or if wet stacking is prevalent, the unit shall be exercised with a load bank to a minimum 75% capacity for 2 hours.

[NOTE: Continual low or no load running results in low pressures in the engine cylinders which do not allow the piston rings to seat resulting in oil entering the combustion chamber and exhaust tract. This is commonly referred to as “wet stacking” and can cause reduced capacity, equipment damage and premature failure.]

8.3 Automatic Start/Stop – Inspect.

8.4 Check louvers, shutters and room exhaust fans for proper operation.

8.5 Generator Set Vibration – Inspect.

8.6 Read and record all gauges/meters.

8.7 Record load readings – Voltage, amps, frequency, power factor.

8.8 Check exhaust for excessive black or white smoke.

8.9 Check turbocharger for vibrations or any abnormal noise during operation.

8.10 Check generator bearing for noise and overheating.

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8.11 Check exhaust manifold, flexible exhaust, muffler, and piping for leaks and secure mountings.

8.12 Check Crankcase breather/Blow By

8.13 Check / service air cleaner

9. Additional.

9.1 Ensure system is left in proper position for automatic start and transfer.

9.2 Clean generator and generator room. Wash radiator if necessary.

9.3 Annotate date, hours and maintenance in Generator log, complete maintenance checklist and deficiency report and brief COR.

9.4 Perform any additional maintenance tasks as recommended in the manufacture's operation and maintenance manuals.

9.5 Submit Service Inspection and Test Report to COR.

C. ANNUAL SSCHEDULE or every 250hrs, whichever comes first:

1. Conduct semi- annual / monthly 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(s) – Replace.

6. Annotate date and hours on all filters when replaced.

7. Fuel Filters and Water Separators – Replace.

a. To include filters to day tanks if applicable.

8. Obtain fuel sample at day tank and storage tank for analysis.

9. Radiator – Clean (follow manufacturer's recommendation).

10. Intake louvers and ducts – Inspect/Clean (follow manufacturer's recommendation).
Replace filters.

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11. Cooling System Coolant Sample - Test
 12. Cooling System Supplemental Coolant Additive (SCA) - Test/Add
 13. Coolant filter – Change if applicable
 14. Crankshaft Vibration Damper - Inspect
 15. Engine Protective Devices - Check
 16. Turbocharger – Inspect/Check
 17. Clean and lubricate fuel pump linkages if applicable.
 18. Fan bearing – Inspect/Grease.
 19. Generator – Check for moisture, dust, oil, grease, and debris on main stator windings, exciter. Check commutator & slip rings, rotor & stator, bearings, bearing lubrication, voltage regulator. Measure & record resistance readings of windings with insulation tester (Megger). Clean as needed
 20. Calibrate voltage-sensing relays/devices.
 21. Check injector pump and injectors for flow rate pressure
 22. Clean / Test Aftercooler Core
 23. Check Rotating Rectifier
 24. Inspect Alternator
 25. Inspect / Check Varistor
- D. ADDITIONAL MAINTENANCE required per manufacturers recommendations and service interval:
1. Generator bearing – Inspect/Grease as recommended by manufacturer’s maintenance schedule.
 2. Engine Generator Batteries – Replace if 3 years old. [NOTE: indicate age of current batteries]
 3. Cooling System Coolant – Flush system and replace per manufacturer’s maintenance schedule with coolant per manufacturers specifications.

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3.1 Every 3 years since last change. Every 6 years for Extended life coolant

§ When performing coolant change; replace engine thermostats.

§ Replace hoses if necessary.

4. Engine Valve Lash - Inspect/Adjust per manufacturer's maintenance schedule.

4.1 This may occur at 250hrs or up to 1500hrs depending upon manufacturer and model number.

4.2 If this has not been done, contractor needs to perform at first service.

V. ACOR AND POC AT POST

1. All questions concerning the scope and requirements of the U.S. Embassy, shall be directed to the ACOR (see below):

ACOR
Georgi Penev
PenevGP@state.gov
Building Engineer
Telephone # +35929395674

2. The Point of Contact (POC) will be the contractor's contact at the U.S. Embassy. The POC will assist and direct the contractor when scheduling work, obtaining approved local supplies, and liaison with Embassy personnel during the course of the Project. All questions concerning coordination of installation activities while at post shall be directed to the POC (see below):

POC at Post
Duane Lambert
PenevGP@state.gov
Facility Manager (FM)
Telephone # +35929395682

END OF SCOPE OF WORK