

## Exhibit A - - STATEMENT OF WORK

### LOW VOLTAGE DIESEL STANDBY GENERATORS

#### I. GENERAL INFORMATION:

The United States Consulate in Mumbai 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.

#### DESCRIPTION OF EQUIPMENT \*:

*\*Please see attachment at the end of this sheet for more details*

#### III. GENERAL REQUIREMENTS:

The contractor shall provide the labor and materials required to carry out all preventive maintenance as outlined in this SOW. Consulate staff have service manuals for Generators and ATS's 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manuals are complete and current and provide the Contracting Officer's Representative (COR) a listing of any missing or out of date manuals. **The technician shall sign off on every task specified in the Statement of Work and will provide a typewritten copy of their report to the COR or the COR's designate within five business days of each maintenance visit.**

#### 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). The Contractor will provide an SDS to the COR immediately upon delivery of each chemical to be used by Contractor personnel on-site. The SDS 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
  - a. Only fluids which meet or exceed manufacturer's specifications shall be used.
  - 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 / will not**] provide load banks for generator testing. [**NOTE: If Post is providing a load bank, insert details here (make, model, size)**]

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.

At a minimum, the following work shall be completed:

#### Notes:

- Contractor shall submit to the COR for review, work sheet/checklist that will be used for performing maintenance service.
- A discrepancy report shall be submitted to the COR immediately upon discovery of any condition that could result in equipment failure.
- Laboratory report for all chemicals (oil, coolant or fuel analysis) shall be submitted to the COR within 30 days from date of service.

## Maintenance Interval Schedule

#### *[NOTES FOR POST:*

- *This is a basic generic list. Manufacturer's recommendations should be followed and supersede recommendations in this list. Note: contractor should make confirm these before finalizing contract.*
- *The manufacturer's maintenance schedules can be taken directly from equipment operations and maintenance manual and used in place of the list below.*
- *Generators experiencing periods of prime usage and those operating in severe environments may require more frequent maintenance.*
- *Before each consecutive interval is performed, all maintenance from the previous intervals must be performed.*
- *Diesel Generators are composed of a prime mover, alternator, fuel, cooling, ventilation and*

*lubrication systems, start and transfer systems, load banks as well as control and monitoring systems and are an essential component of the Diplomatic Facility's Electrical Supply System.*

- *The contract does not replace the need for operator level checks and inspections. There may be items pertinent to the operation of the system which are not included in this SOW.]*

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. Semi-annual Schedule**

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 damage.
  - Inspect supports and spring isolators for soundness and stability.
  - Inspect system for corrosion.
  - Hoses and Clamps – Inspect and replace if needed.
  - Belts – Inspect and adjust/replace if needed.
  - Inspect all fuel, oil, and water piping for secure mounting and leaks.
  - Inspect exhaust piping and muffler insulation.
  - Check / service air cleaner
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.
  - Coolant conditioner (DCA/SCA) / Antifreeze protection – Check and adjust to specs.
  - Jacket Water Heater - Check proper operation.
  - Water pump - Check
  - Engine Oil Level - Check and add if needed.
  - Fuel/water separators – Drain water.
  - Engine Air Cleaner Service Indicator – Check, replace filter if needed.
4. Generator Room.
  - Fuel s – Inspect and treat fuel if needed, check fuel level, drain water and sediment.
    - Test fuel for degradation, water and microbial contamination.
    - Test autofill system, return to tank and alarms.
    - Check tank vents & overflow piping for obstructions
    - Test alarms and or pumps in secondary containment.Check hoses, piping and connections ***[NOTE: Diesel fuel in day tanks stored under normal moderate environmental conditions should be useable for 12 months or more at 20°C (68°F) and 6-12 months at 30°C (85°F). Storage life is shortened by:***
    - *Water which permits the growth of fungus and bacteria.*
    - *Exposure to temperatures greater than 30°C (85°F).*
    - *Contact with zinc or copper.*
    - *Poor original fuel quality.*
    - *Exposure to dirt and other contaminants.]*

- Space Heater/Room exhaust fan - Check for proper operation.
  - Air intake/exhaust – Ensure nothing obstructs airflow; louvers are free and operate properly.
5. Control Panel/generator cabinet.
- Open all cabinets; remove panel covers to clean/inspect.
  - 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.
  - Check all control wiring and power cables (especially wiring between or near hinged door) for sign of wear and deterioration.
  - Check the cabinet interior for loose hardware – tighten connections.
  - Electrical Connections - Check tightness
  - Clean and remove dust from panels.
6. Automatic Transfer Switch (ATS).
- Inspect seals.
  - Note date of last battery change. (Replace if 2 years or older).
  - Tighten connections.
  - Check for hot spots.
  - Clean dust and vacuum all the controls, meters, switching mechanism components, interior bus work, Remote Start control panel, Annunciator and connecting lugs of the ATS.
  - Inspect/Check bus work and supporting hardware for carbon tracking, cracks, corrosion, or any type of deterioration.
  - Check all control wiring and power cables (especially wiring between or near hinged door) for sign of wear and deterioration.
  - Check the cabinet interior for loose hardware – tighten connections.
  - Check for evidence of overheating contacts.
  - Check ATS operation, calibrate and record time delays if necessary. Observe and record retransfer/cool down time.
  - Exercise ATS.
    - Prior to performing test, confirm with the COR.
    - This test shall consist of an electronic operation of the switch from the normal source 1 position to the alternate source 2 position and a return to normal.
    - ***[NOTE: The primary objective of this “test” is actually to exercise the moving mechanical parts of the ATS which will seize if left in one position without regular operation.]***
7. Run unit – No load.
- Run the generator with no load for 10 minutes.
    - Remote Start Panel-Inspect and test operation. Inspect and clean.
    - 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.
- Unit should be run under facility load if COR authorizes to test and exercise entire system.

- 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.]***

- Automatic Start/Stop – Inspect.
- Check louvers, shutters and room exhaust fans for proper operation.
- Generator Set Vibration – Inspect.
- Read and record all gauges/meters.
- Record load readings – Voltage, amps, frequency, power factor.
- 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, flexible exhaust, muffler, and piping for leaks and secure mountings.
- Check Crankcase breather/Blow By
- Check / service air cleaner

9. Additional.

- Ensure system 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, complete maintenance checklist and deficiency report and brief COR.
- Perform any additional maintenance tasks as recommended in the manufacture’s operation and maintenance manuals.

***[NOTE: contractor should make note of these before finalizing contract.]***

**B. Annual Schedule 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.
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

**C. 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.
  - Every 3 years since last change. Every 6 years for Extended life coolant
    - When performing coolant change; replace engine thermostats.
    - Replace hoses if necessary.***[NOTE: if this hasn’t been done – this needs to be performed at contractor’s first service.]***
4. Engine Valve Lash - Inspect/Adjust per manufacturer’s maintenance schedule.  
***[NOTE: typically, manufacturers require an initial valve lash to be performed.]***
  - This may occur at 250hrs or up to 1500hrs depending upon manufacturer and model number.
  - If this has not been done, contractor needs to perform at first service.
  - Many manufacturers and models require this to be done annually or according to an schedule based on run time. This needs to occur at first service if this has not been done and according to manufacturer’s requirements.

**D. Additional:**

1. The contractor shall supply to post: (include items below if needed)
  - Troubleshooting and repair manuals for XXX. (Most posts lack these manuals)***[Note for post: If you need special tools, diagnostic equipment or other items to perform maintenance in between annual service visits. Have contractor provide at first visit. If contractor comes from out of country it may be beneficial to have these items onsite.]***

Equipment List: (list generators, ATS, day tanks and other related equipment to be serviced or maintained)

Equipment	Manufacturer	Make	Model	Eng hrs	Specifications	Location
NOB-Generator-PCC	Cummins Power	Cummins Power	KTA50 G3		263213	NOC
NOB-ATS-G	Cummins Power	Cummins Power	OTPC400		263600	NOB
Generator PCC-Day Tank	Pryco	Pryco	PY200ULDW		335613	NOB
UTL-Load Bank	Avtron	Avtron			263000	NOB

END OF STATEMENT OF WORK