

# Generator Maintenance SOP

|                |                     |
|----------------|---------------------|
| Document no.   | SOP-MNT-007         |
| Revision       | 1.0                 |
| Owner          | Maintenance Manager |
| Effective date | September 15, 2026  |
| Review cycle   | Every 12 months     |

## 1. Purpose

To make sure standby generators start and carry load reliably when needed, by keeping fluids, batteries, fuel and controls maintained and tested on a regular schedule.

## 2. Scope

Applies to standby and backup generators used for emergency or backup power. Portable generators used for temporary equipment power are covered by a separate procedure.

### Definitions

|                 |                                                                                                                                                                     |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No-load test    | Starting and running the generator without connecting it to the building or equipment load, to confirm it starts and runs correctly.                                |
| Load bank test  | Running the generator against a controlled test load to confirm it can carry its rated capacity, since standby generators rarely see full load in normal operation. |
| Transfer switch | The device that automatically switches power supply between utility power and the generator during an outage.                                                       |
| Run hours       | The cumulative hours a generator has operated, tracked to schedule service intervals.                                                                               |

## 3. Responsibilities

|                         |                                                                                                                |
|-------------------------|----------------------------------------------------------------------------------------------------------------|
| Maintenance Technician  | Performs visual inspections, fluid checks and routine test runs, and logs results.                             |
| Maintenance Electrician | Tests the transfer switch, battery charging system and electrical connections.                                 |
| Maintenance Manager     | Reviews test results, schedules annual service and load bank testing, and approves corrective repairs.         |
| Facility Manager        | Coordinates test timing with building operations and is notified of any generator that fails a readiness test. |

### RACI matrix

| Activity                              | Maintenance Technician | Maintenance Electrician | Maintenance Manager | Facility Manager |
|---------------------------------------|------------------------|-------------------------|---------------------|------------------|
| Perform the routine visual inspection | R/A                    | I                       | I                   | -                |
| Perform the no-load start test        | R/A                    | C                       | I                   | I                |

| Activity                   | Maintenance Technician | Maintenance Electrician | Maintenance Manager | Facility Manager |
|----------------------------|------------------------|-------------------------|---------------------|------------------|
| Perform the load bank test | R                      | R                       | A                   | C                |
| Test the transfer switch   | C                      | R/A                     | I                   | C                |
| Schedule annual service    | I                      | I                       | R/A                 | C                |

R = Responsible, A = Accountable, C = Consulted, I = Informed

## 4. Materials and PPE

### Materials, tools and systems

- Generator PM schedule and manufacturer service manual
- Multimeter and battery load tester
- Fuel quality test kit
- Load bank test equipment or contracted load bank service
- Generator run log
- Spill containment supplies

### Personal protective equipment

- Safety glasses
- Hearing protection
- Insulated gloves for electrical checks
- Fuel-resistant gloves when checking the fuel system

## 5. Procedure

| Step | Task                                                                                                                                                                                                                                                                                                                                              | Owner                   | Done                     |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------------------|
| 5.1  | <b>Review the PM schedule and run hours</b><br>Technician checks the generator's PM schedule and current run hours in the CMMS to confirm which tasks are due this visit.                                                                                                                                                                         | Maintenance Technician  | <input type="checkbox"/> |
| 5.2  | <b>Perform the visual inspection</b><br>Technician inspects the generator enclosure, engine and fuel lines for leaks, corrosion, loose connections or physical damage.                                                                                                                                                                            | Maintenance Technician  | <input type="checkbox"/> |
| 5.3  | <b>Check engine oil and coolant levels</b><br>Technician checks engine oil and coolant against the manufacturer's specified levels and tops up or schedules an oil change if due.                                                                                                                                                                 | Maintenance Technician  | <input type="checkbox"/> |
| 5.4  | <b>Test the battery and charging system</b><br>Electrician load-tests the starting battery, checks terminal connections for corrosion, and confirms the battery charger is maintaining the correct float voltage.<br><b>Warning:</b> Treat battery terminals as energized; wear insulated gloves and avoid creating a short across the terminals. | Maintenance Electrician | <input type="checkbox"/> |
| 5.5  | <b>Check the block heater and starting circuits</b><br>Technician confirms the block heater is warming the engine to the specified temperature and checks starting circuit wiring for damage or loose connections.                                                                                                                                | Maintenance Technician  | <input type="checkbox"/> |

| Step | Task                                                                                                                                                                                                                                                                                                                                  | Owner                   | Done                     |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------------------|
| 5.6  | <b>Perform the no-load start test</b><br>Technician starts the generator and runs it unloaded for the specified time, checking oil pressure, coolant temperature and voltage output against normal ranges.<br><b>Checkpoint:</b> Generator reaches rated voltage and frequency within the manufacturer's specified start time.        | Maintenance Technician  | <input type="checkbox"/> |
| 5.7  | <b>Inspect the fuel system and quality</b><br>Technician checks the fuel tank level, inspects for water or contamination using the fuel test kit, and confirms fuel filters are within their service interval.                                                                                                                        | Maintenance Technician  | <input type="checkbox"/> |
| 5.8  | <b>Test the transfer switch</b><br>Electrician simulates a utility power loss to confirm the transfer switch signals the generator to start and switches the load over within the expected time.<br><b>Checkpoint:</b> Transfer switch completes the changeover within the manufacturer's specified time during the simulated outage. | Maintenance Electrician | <input type="checkbox"/> |
| 5.9  | <b>Perform the periodic load bank test</b><br>Technician and electrician run the generator against a load bank at the interval specified in the PM schedule to confirm it can carry its rated capacity without wet-stacking or overheating.                                                                                           | Maintenance Manager     | <input type="checkbox"/> |
| 5.10 | <b>Check exhaust and ventilation</b><br>Technician inspects the exhaust system for leaks or damage and confirms generator room or enclosure ventilation louvers are clear and functioning.                                                                                                                                            | Maintenance Technician  | <input type="checkbox"/> |
| 5.11 | <b>Record run hours and test results</b><br>Technician logs run hours, test readings, fuel level and any alarms or faults observed in the generator run log and the CMMS.                                                                                                                                                             | Maintenance Technician  | <input type="checkbox"/> |
| 5.12 | <b>Address alarms and schedule annual service</b><br>Maintenance manager reviews any alarm or out-of-range reading, arranges corrective repair, and schedules the manufacturer-recommended annual service with a qualified technician.                                                                                                | Maintenance Manager     | <input type="checkbox"/> |

## 6. Quality checks

- No-load start tests are completed on the full PM schedule with no missed intervals.
- Every load bank test result is compared against the generator's rated capacity.
- Transfer switch changeover time is recorded and compared to the manufacturer's specification.
- Fuel quality is tested at the scheduled interval and any contamination is addressed before the next outage.

## 7. Records

- Generator run log with test results
- Load bank test reports
- Transfer switch test results
- Annual service records

## 8. KPIs

- Percentage of scheduled test runs completed
- Generator failures to start on demand
- Load bank test pass rate
- Average transfer switch changeover time

9. Common mistakes

- Only performing no-load tests and never load bank testing the generator.
- Letting the battery charger go unchecked until the battery fails to start the engine.
- Skipping fuel quality checks on generators that run infrequently.
- Not recording run hours accurately, causing missed service intervals.
- Assuming a successful no-load test means the generator can carry full building load.

10. Revision history

| Revision | Date               | Description     | Reviewed by     |
|----------|--------------------|-----------------|-----------------|
| 1.0      | September 15, 2026 | Initial release | Ilia Pirozhenko |

Approval

| Prepared by | Approved by | Date |
|-------------|-------------|------|
|             |             |      |

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