STANDARD OPERATING PROCEDURE

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

Step	Task	Owner	Done
5.6	**Perform the no-load start test** Technician starts the generator and runs it unloaded for the specified time, checking oil pressure, coolant temperature and voltage output against normal ranges. **Checkpoint:** Generator reaches rated voltage and frequency within the manufacturer's specified start time.	Maintenance Technician	☐
5.7	**Inspect the fuel system and quality** 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	☐
5.8	**Test the transfer switch** 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. **Checkpoint:** Transfer switch completes the changeover within the manufacturer's specified time during the simulated outage.	Maintenance Electrician	☐
5.9	**Perform the periodic load bank test** 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	☐
5.10	**Check exhaust and ventilation** Technician inspects the exhaust system for leaks or damage and confirms generator room or enclosure ventilation louvers are clear and functioning.	Maintenance Technician	☐
5.11	**Record run hours and test results** Technician logs run hours, test readings, fuel level and any alarms or faults observed in the generator run log and the CMMS.	Maintenance Technician	☐
5.12	**Address alarms and schedule annual service** 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	☐

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

This is a template. Adapt it to your organization, equipment and local regulations before use.

Scan for the latest version

Opens this template online, where you can download it again in Word, PDF, Excel or CSV — free, no sign-up.

Or add it to Perfect Wiki so your team can find it and ask questions about it in Microsoft Teams, Slack, kChat or Mattermost.