


**UNIVERSITY OF TOLEDO
FACILITIES AND CONSTRUCTION**

Section:	Electrical/Electronics	Procedure Number:	E-21
Subject:	Emergency Generator Tests and Inspections	Effective Date:	February 1989
		Revised Date:	December 2019
Facilities Officer:		Reviewed Date:	February 2023

Standard Operating Procedure

All emergency electrical generators will be tested and inspected on a regular basis.

Purpose

To ensure that the testing meets the manufacturer's specifications, NFPA 70B, NFPA 99 and all other regulatory mandates.

Procedure

NOTIFICATION PROTOCOL REQUIRED FOR ALL GENERATOR TESTING:

1. The generators are to be tested on the first Wednesday of each month. The only exception to this policy would be in the event of a trauma or organ transplant procedure in progress. In that event, the generator testing may be postponed and rescheduled to be tested within the following 48 hours.
2. The Operating Engineers 383-4298 and Campus Police 383-2600 **MUST** be notified prior to ANY GENERATOR START UP PROCEDURE, regardless of whether or not the generator is in a "load" or "no load" configuration.
3. The Operating Room 383-3900, Central Supply 383-5107 and CT Scan 383-5417 must be notified prior to starting and before shutting down the generators under a load condition (this is a notification, not a request for permission).
4. Information Systems 383-3653 must be notified prior to the Dowling Hall generator being operated under a "load" condition.

Weekly:

1. Checks – water, fuel, oil, batteries – fill where required.

Monthly:

1. Conduct operating test of generator and the following load transfer switches:
 - a) Hospital – Life Safety, Life Support Unit, Critical, Equipment, Fire Pump, Elevator
 - b) Dowling Hall – Uninterruptible Power Supply, Emergency Switch Data, Life Support – Critical
 - c) Ruppert Health Center
 - d) Comprehensive Care Center
 - e) Dana Cancer Center

Under load conditions for forty-five (45) minutes. This includes warm-up and cool-down times.

2. Record all instrument readings. 1. At start 2. At mid run 3. At finish

3. Check the following:
 - a) Fuel tank level
 - b) Coolant level
4. Engine cooling system:
 - a) Condition of fan and alternator belts
 - b) Squeeze and check hoses and connections.
5. Engine lubrication system:
 - a) Lubricating oil level
 - b) Appearance of oil
 - c) Oil pressure correct
 - d) Crankcase breather
6. Engine electrical starting system:
 - a) Battery terminals, clean and tighten
 - b) Electrolyte level
 - c) Trickle charger operating properly
7. Engine exhaust system:
 - a) Condensate trap drained.
 - b) Exhaust leaks
 - c) All connections tight

Annual: (To be performed by outside contractor)

1. Visual inspection.
2. Perform applicable services listed by manufacturer of units.
3. Check and/or adjust where applicable, injectors, throttle linkage and valves.
4. Check and/or adjust governor, battery, charge rate, battery, D.C. generator or alternator, cooling system and exhaust system.
5. Start up and run unit.
6. Observe operating conditions:
 - a) Oil pressure

- b) Water temperature
 - c) Charging generator
 - d) Engine
 - e) A.C. alternator
 - f) General conditions
 - g) Stack temperature
7. Check output voltage and frequency under load.
8. Check switchboards for proper operation.
9. Governor:
- a) Check all linkage
 - b) Observe for unusual oil leakage
10. Generator:
- a) Check brush length and appearance
 - b) Check appearance of slip rings and clean if necessary
 - c) Blow out with clean, dry compressed air
11. Engine safety controls:
- a) Check operation of all engine operating alarms and safety shut down devices. (Generator not under load for this test.)
12. Main switch gear:
- a) Operate every circuit breaker manually.
 - b) Visually check busbars, bracing and feeder connections for cleanliness and indications of overheating.
13. Filter Changes:
- a) Change oil
 - b) Oil filters
 - c) Water filters
 - d) Breather filters

PROCEDURES TO BE FOLLOWED DURING ALL TESTING AND INSPECTION:

General:

1. Note any unusual condition of:
 - a) Vibration deterioration
 - b) Leakage
 - c) High surface temperature
 - d) Noise

2. Supplies that should be readily available:
 - a) Distilled Water
 - b) Rags
 - c) Broom Dust Pan
 - d) Eye protection
 - e) Hearing protectors

3. Check and record the time intervals of the various increments of the automatic start-up and shut down sequences.

4. Check overall cleanliness of room.

5. Remove any unnecessary items in generator room.

6. Take prompt action to correct all improper conditions indicated during test.

7. Check that standby system is set to automatic start and load transfer.

8. Failure to successfully start the generators, notify the Utility Manager.

9. Generator service contractor:

Hospital, Dowling Hall, Ruppert Health Center	Ohio CAT or Cummins
Health Education	Ohio CAT or Cummins
Dana Cancer Center	Ohio CAT or Cummins
Comprehensive Care Center	Ohio CAT or Cummins