

**KANSAS STATE FIRE MARSHAL**  
**Fire Fact (Health Care)**

**Fire Fact #: HC2**

**K-Tag: 144**

**References: NFPA 99 & NFPA 110**

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The inspection, testing, and maintenance schedule for your Essential Electrical System (EES) generators is specified below. Generators shall be inspected weekly, monthly, and annually as well as exercised under load at least monthly.

Individuals responsible for testing and maintaining the system must be trained and knowledgeable in the system and its functions

10-second Rule:

- The generator set shall be maintained to be capable of supplying the service within the shortest time practical and within 10-seconds after the interruption of the normal service

General Inspection & Testing: Generator sets shall be

- Inspected weekly, monthly and annually (see inspection chart below)
- Tested twelve (12) times a year under load conditions
  - o Intervals not less than 20 days or exceeding 40 days
  - o Including a complete simulated cold start
  - o Transfer of all essential electrical system loads

Load Testing Requirements: All generators shall be

- Exercised at least monthly for 30 minutes
  - o At not less than 30% of the EPS nameplate rating

Note: If you have a diesel-powered generator that cannot meet the above conditions, the facility must then meet the following:

- Exercise generator at least monthly with available load
- Load-Bank test annually (2 hrs total)
  - o 25% for 30 minutes
  - o 50% for 30 minutes
  - o 75% for 60 minutes

**Background Information:**

When conducting the monthly load tests, some facilities may not have enough equipment connected to the generator in order to meet the generators 30% load capacity. In this situation, the facility needs to document everything that is connected to the generator and the total load percentage that is being utilized.

Furthermore, if the generator is a diesel powered generator, and the facility is unable to reach 30% capacity, there is an additional requirement to have an annual load bank test conducted. This additional requirement is only for diesel powered generators that cannot reach 30% of the listed load. The reason this is required for diesel powered generators and not the other gas powered generators is due to the carbon buildup that occurs in diesel systems.

The annual load bank test must be conducted by a generator contractor. The contractor will bring the load bank testing equipment, which will then be hooked up to the generator. The load bank equipment will transfer enough load to meet the testing percentages outlined in NFPA 110. Due to the transferring of higher load percentages, the load bank test forces/blows out a large portion of the carbon buildup that occurs overtime from not fully utilizing the equipment.

## Maintenance Schedule

Component	Procedure X – Action R - Replace					Frequency W-Weekly M- Monthly Q – Quarterly A - Annually	
	Visual	Check	Change	Clean	Test	Type 1	Type 2
<b>Fuel</b>							
Main supply tank level		x				W	M
Day tank level		x				W	M
Day tank flow switch	x					W	Q
Supply or transfer pump operations	x				x	W	Q
Solenoid valve operation	x				x	W	Q
Strainer, filter, dirt leg, or combination	x				x	Q	Q
Water in system				x		W	Q
Flexible hose and connectors		x		x		W	M
Tank vents and overflow piping unobstructed	x		R			A	A
Piping		x			x	A	A
Gasoline in main tank (when used)			R			A	A
<b>Lubrication system</b>							
Oil level	x	x				W	M
Oil change			R			50 or A	50 or A
Oil filters			x			50 or A	50 or A
Lube oil heater		x				W	M
Crankcase breather	x		R	x		Q	S
<b>Cooling System</b>							
Level	x	x				W	M
Antifreeze protection level				x		S	A
Antifreeze			x			A	A
Adequate cooling water to heat exchanger		x				W	M
Rod out heat exchanger				x		A	A
Adequate fresh air through radiator		x				W	M
Clean exterior of radiator				x		A	A
Fan and alternator belt	x	x				M	Q
Water pumps	x					W	Q
Condition of flexible hoses and connection	x	x				W	M
Jacket water heater		x				W	M
Inspect duct work, clean louvers	x	x	x			A	A
Louver motors and controls	x			x	x	A	A
<b>Exhaust System</b>							
Leakage	x	x				W	M
Drain condensate trap		x				W	M
Insulation and fire hazards	x					Q	Q
Excessive backpressure					x	A	A
Exhaust system hangers and supports	x					A	A
Flexible exhaust section	x					S	S
<b>Battery System</b>							

Electrolyte level		x				W	M
Terminals clean and tight	x	x				Q	Q
Remove corrosion, case exterior clean and dry	x			x		M	M
Specific gravity or state of charge					x	M	M
Charger and charge rate	x					M	M
Equalize charge		x				M	M
<b>Electrical System</b>							
General Inspection	x					W	M
Tighten control and power wiring connections		x				A	A
Wire chafing where subject to movement	x	x				Q	S
Operation of safeties and alarms		x			x	S	S
Boxes, panels, and cabinets				x		S	S
Circuit breakers, fuses	x	x	R	x	x	2 or M	2 or A
Transfer switch main contacts	x			x		A	A
Calibration of voltage-sensing relays/devices		x			x	5 or A	5 or A
Wire insulation breakdown					x	5/500a	3/500b
<b>Prime Mover</b>							
General Inspection	x					W	M
Service air cleaner			x	x		S	S
Governor oil level and linkage	x	x				M	M
Governor oil			x			A	A
Ignition system – plugs, points, coil, cap, rotor, wire insulation	x	x	R	x	x	A	A
Choke setting and carburetor adjustment		x				S	S
Injector pump and injectors for flow rate pressure and/or spray pattern					x	A	A
EPS at min of 80% nameplate rating					x	3/4c	3/4c
Valve clearance					x	3/500b	3/500b
Torque bolts					x	3/500b	3/500b
<b>Generator</b>							
Electrolyte level	x					W	M
Brush length, appearance, free to move in holder	x	x		x		S	S
Commutator and slip rings	x			x		A	A
Rotor and stator	x			x		A	A
Bearings	x		R			A	A
Bearing grease		x	R			A	A
Exciter	x	x				A	A
Voltage regulator	x	x				A	A
Measure and record resistance reading of windings with insulation testerA					x	A	A
General condition of EPSS	x			x		W	M
Service room or housing housekeeping	x			x		W	M
Restore system to automatic operation condition	x					W	M