

## NFPA 25, 2023 Code References for Inspection and Testing of Fire Pump Controllers

### 8.1 General

- 8.1.1.2.2.1 Electrical connections shall be inspected annually and repaired as necessary.
- 8.1.1.2.4.1 Printed circuit boards (PCBs) shall be inspected annually for corrosion.
- 8.1.1.2.5.1 Cable and/or wire insulation shall be inspected annually for cracking.
- 8.1.1.2.6.1 Plumbing parts, both inside and outside of electrical panels, shall be inspected annually for any leaks.
- 8.1.1.2.8 (Diesel only) Supervisory signal circuitry shall be tested annually for high cooling water temperature.
- 8.1.1.2.16.1 All controls and power wiring connections shall be inspected annually and repaired as necessary.
- 8.1.1.2.22 The accuracy of pressure gauges and sensors shall be inspected annually and replaced or recalibrated when more than 5 percent out of calibration to the extent that such work can be completed without opening an energized electric motor-driven fire pump controller.

### 8.2 Inspection

- 8.2.2 Electrical system conditions are determined as follows:
  - (a) Controller pilot light (power on) is illuminated.
  - (b) Transfer switch normal pilot light is illuminated.
  - (c) Isolating switch is closed — standby (emergency) source.
  - (d) Reverse phase alarm pilot light is off, or normal phase rotation pilot light is on.
  - (f) Power to pressure maintenance (jockey) pump is provided.
- 8.2.2 (continued) Diesel engine system conditions are determined as follows:
  - (a) Fuel tank is at least two-thirds full.
  - (b) Controller selector switch is in auto position.
  - (c) Batteries' (2) voltage readings are within acceptable range.
  - (d) Batteries' (2) charging current readings are within acceptable range.
  - (e) Batteries' (2) pilot lights are on or battery failure (2) pilot lights are off.
  - (f) All alarm pilot lights are off.
  - (g) Engine running time meter is reading.
  - (k) Electrolyte level in batteries is within acceptable range.
  - (l) Battery terminals are free from corrosion.
  - (m) Water-jacket heater is operating.

## **8.3 Testing**

**-8.3.2.9** The pertinent visual observations or adjustments specified in the following checklists shall be conducted while the pump is running:

(1) Pump system procedure is as follows:

- (a) Record the pump starting pressure from the pressure switch or pressure transducer.
- (b) Record the system suction and discharge pressure gauge readings.
- (c) Inspect the pump packing glands for slight discharge.
- (d) Adjust gland nuts if necessary.
- (e) Inspect for unusual noise or vibration.
- (f) Inspect packing boxes, bearings, or pump casing for overheating.
- (g) Record pressure switch or pressure transducer reading and compare to the pump discharge gauge.
- (h) For pumps that use electronic pressure sensors to control the fire pump operation, record the current pressure and the highest and the lowest pressure shown on the fire pump controller event log.
- (i) For electric motor and radiator cooled diesel pumps, check the circulation relief valve for operation to discharge water.

(2) Electrical system procedure is as follows:

- (a) Observe the time for motor to accelerate to full speed.
- (b) Record the time controller is on first step (for reduced voltage or reduced current starting).
- (c) Record the time pump runs after starting (for automatic stop controllers).

(3) Diesel engine system procedure is as follows:

- (a) Observe the time for engine to crank.
- (b) Observe the time for engine to reach running speed.
- (c) Observe the engine oil pressure gauge, speed indicator, water, and oil temperature indicators periodically while engine is running.
- (d) Record any abnormalities.
- (e) Inspect the heat exchanger for cooling waterflow.

**-8.3.3.6** Discharge and sensing orifices that can be visually observed without disassembling equipment, piping, or valves shall be visually inspected and be free of damage and obstructions that could affect the accuracy of the measurement.

**-8.3.3.12** (During Flow Testing) For installations having an automatic transfer switch, the following test shall be performed to ensure that the overcurrent protective devices (i.e., fuses or circuit breakers) do not open:

- (1) Simulate a power failure condition while the pump is operating at peak load
- (2) Verify that the transfer switch transfers power to the alternate power source
- (3) While the pump is operating at peak load and alternate power, record the following to include in the pump test results:

- (a) The voltage where an external means is provided on the controller
- (b) The amperage where an external means is provided on the controller
- (c) The rpm
- (d) Suction pressure
- (e) Discharge pressure

(4) Verify that the pump continues to perform at peak horsepower load on the alternate power source for a minimum of 2 minutes

(5) Remove the power failure condition and verify that, after a time delay, the pump is reconnected to the normal power source.

**-8.3.3.13** Alarm conditions shall be simulated by activating alarm circuits at alarm sensor locations and confirmed for proper operation.

**- 8.5.1** A preventive maintenance program shall be established on all components of the pump assembly in accordance with the manufacturer's recommendations. - NFPA defines "pump assembly" as anything that is associated with the pump's operation including but limited to fire pump controllers.