

PM000026

Revision 8

**WEEKLY SURVEILLANCE FOR FIRE WATER SUPPLY
AND DISTRIBUTION SYSTEM**

Maintenance Procedure
Continuous Use
[FP01]

APPROVED FOR USE

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1.0 INTRODUCTION

Specifically, this work will accomplish the following:

- Weekly Fire Pump Test
- Restoration

This procedure generates the following Quality records in accordance with WP 13-1, Quality Assurance Program Description (QAPD) and RCRA records.

This procedure meets the Surveillance Requirement 4.1.2.4.

- Attachment 1 - Fire Pump Test Form

2.0 REFERENCES

BASELINE (DEVELOPMENTAL)

| | |
|---|--|
| NFPA 20 | Centrifugal Fire Pumps |
| NFPA 25 | Inspection, Testing and Maintenance of Water - Based Fire Protection System |
| WP 12-FP.01 | Fire Protection Program |
| WP 12-FP3001 | Fire Protection Impairment |
| OSHA - 29 C.F.R. § 1910, subpart L | Fire Protection |
| WP 04-FP1201 | Site Fire Water Supply System Operations |
| WP 04-AD3011 | Equipment Tagout/Lockout |
| WP 10-2 | MOIM |
| WP 10-WC3010 | Maintenance PM/MWI Controlled Document Processing |
| WP 10-WC3011 | Maintenance Process |
| WP 12 IS.01 | Industrial Safety Program |
| WP 13-1 | Washington TRU Solutions LLC Quality Assurance Program Description |
| Various | Fire Pump Operation and Maintenance Manuals |
| WIPP Hazardous Waste Facility Permit, NM 4890139088, TSDF, New Mexico | Environment Department, October 27, 1999 |
| DOE-HDBK 1062-96 | DOE Fire Protection Handbook |
| DOE/WIPP-95-2125 | Waste Isolation Pilot Plant Contact Handled (CH) Technical Safety Requirements |
| DOE/WIPP-06-3178 | Waste Isolation Pilot Plant Remote Handled (RH) Technical Safety Requirements |

3.0 MATERIAL LIST

None

4.0 EQUIPMENT LIST

- Hearing protection
- Keys for Fire Alarm Panel (FAP) and Diesel Engine Fire Pump Controller Panel

5.0 PRECAUTIONS

Diesel engine normal operating parameters are:

- Oil Pressure Gauge: 28 - 60 psi
- Water Temperature Gauge: 165° - 185°F
- Tachometer Gauge: 1750 - 1825 rpm

6.0 LIMITATIONS

[] 6.1. OTHER LIMITATIONS

- The order of completion of this work may be modified, or sections may be performed in parallel, provided that proper Tagout/Lockout is observed and that no Hold Points or precautionary actions associated with Warning statements are bypassed.
- Electric Fire Pump will start automatically when system pressure is decreased to 120 ± 3 psig. **This is a surveillance requirement.**
- Diesel Fire Pump will start automatically when system pressure is decreased to 110 ± 3 psig. **This is a surveillance requirement.**
- Facility Shift Manager (FSM) enter/exit LCO 3.1.2.
- Brackets at the beginning of steps are optional place-keeping aids, and may be checked off as work progresses.
- All personnel affixing initials to this package shall provide the information listed in the PERSONNEL DATA TABLE.
- Troubleshooting or other activities outside the scope of this PM may require the initiation of a work order as directed by the Responsible Engineer or Facility Shift Manager.

7.0 PREREQUISITES

7.1. ADMINISTRATIVE

- 7.1.1. Before starting work, FSM or designee will conduct a pre-job safety meeting.

SIGN-OFF FSM

- 7.1.2. Record work order number on Attachments.

7.2. TASK PREPARATION

- 7.2.1. Obtain equipment shown in Equipment section.

8.0 PERFORMANCE

8.1. WEEKLY FIRE PUMP TEST

- 8.1.1. Notify Central Monitoring Room (CMR) operator of fire pump testing.
- 8.1.2. RCRA Deterioration Inspection: Inspect the fire pumps for cracks, erosion, salt buildup, damage, corrosion, loose or missing parts, malfunction or structural deterioration. Record deficiencies in comment section.

SIGN-OFF EST

- 8.1.3. Verify **AND** record the following information:
 - 8.1.3.1. Record status of FAP Indicators and trouble lights next to FAP on data sheet.

SIGN-OFF EST

- 8.1.3.2. South water tank level (at least 80% full).

SIGN-OFF EST

- 8.1.3.3. North water tank level (at least 60% full).

SIGN-OFF EST

- 8.1.3.4. Verify Jockey Pump is lined up for Automatic Operation by checking Breaker switch position and Controller Control switch position. Record results on data sheet.

SIGN-OFF EST

- 8.1.3.5. Verify Electric Pump is lined up for Automatic Operation by checking Breaker Switch position and Power Light. Record results on data Sheet.

SIGN-OFF EST

- 8.1.3.6. Verify Diesel Fire Pump is lined up for Automatic Start-up by checking Main Switch Auto Light on front of Controller. Record results on data Sheet.

SIGN-OFF EST

NOTE

This note applies to section 8.1.3.7

Valves FW-456-2, FW-456-17, FW-456-21, and FW-456-78 are normally locked closed. All other valves are locked open.

- 8.1.3.7. Verify following fire water valve position and record on data sheet.

SIGN-OFF EST

- 8.1.3.8. FW-456-V-1
- 8.1.3.9. FW-456-V-2
- 8.1.3.10. FW-456-V-3
- 8.1.3.11. FW-456-V-4
- 8.1.3.12. FW-456-V-5
- 8.1.3.13. FW-456-V-6
- 8.1.3.14. FW-456-V-7
- 8.1.3.15. FW-456-V-12
- 8.1.3.16. FW-456-V-13
- 8.1.3.17. FW-456-V-14
- 8.1.3.18. FW-456-V-15

- [] 8.1.3.19. FW-456-V-16
- [] 8.1.3.20. FW-456-V-17
- [] 8.1.3.21. FW-456-V-19
- [] 8.1.3.22. FW-456-V-20
- [] 8.1.3.23. FW-456-V-21
- [] 8.1.3.24. FW-456-V-30
- [] 8.1.3.25. FW-456-V-78
- [] 8.1.3.26. Diesel Fuel Tank (45-D-601) level (at least $\frac{3}{4}$ full).

SIGN-OFF EST

- [] 8.1.3.27. Diesel fuel tank valve (DF-456-V-051) is open.

SIGN-OFF EST

- [] 8.1.3.28. Diesel fuel tank cap in place.

SIGN-OFF EST

- [] 8.1.3.29. Diesel engine oil and coolant levels (in operating range).

SIGN-OFF EST

- [] 8.1.3.30. Tightness of diesel engine speed control lock nuts (not loose).

SIGN-OFF EST

- [] 8.1.3.31. Record hour meter reading on diesel engine (prior to test)

SIGN-OFF EST

NOTE

This note applies to section [] 8.1.4

Station person at the 456-PI-008-025 to record fire system pressure when Electric Fire Pump starts.

- [] 8.1.4. Start electric fire pump by slowly opening Inspectors Test Valve FW-456-V-058. Electric Fire Pump will start automatically when system pressure is decreased to 120 ± 3 psig. **This is a surveillance requirement.**

- [] 8.1.5. Record system pressure (456-PI-008-025) when pump starts. Acceptance Criteria is 117 psi to 123 psi. Notify the FSM if Acceptance Criteria is NOT met.

SIGN-OFF EST

- [] 8.1.6. Record time when pump starts.

SIGN-OFF EST

- [] 8.1.7. Once pump has started, close Inspector Test Valve FW-456-V-058 and allow pump to run.

- [] 8.1.8. Verify local fire alarm and CMR alarm, and then silence FAP.

SIGN-OFF EST

- [] 8.1.9. During test, inspect the electric fire pump for:

- [] 8.1.9.1. Water flow from casing relief valve 456-PSV-008-007.

SIGN-OFF EST

- [] 8.1.9.2. Steady dripping of water at packing glands.

SIGN-OFF EST

- [] 8.1.9.3. Proper suction pressure from 456-PI-008-016 (≈ 10 psi).

SIGN-OFF EST

- [] 8.1.9.4. Proper discharge pressure from 456-PI-008-017 (≈ 150 psi).

SIGN-OFF EST

- [] 8.1.9.5. No pump casing overheating.

SIGN-OFF EST

- [] 8.1.9.6. No unusual or abnormal conditions, such as noise or vibration.

SIGN-OFF EST

- [] 8.1.9.7. Record time when Electric fire pump shuts off.

SIGN-OFF EST

- [] 8.1.10. Notify FSM to Enter LCO 3.1.2 – one fire pump inoperable.

SIGN-OFF EST

- [] 8.1.11. Disable automatic start for Jockey Pump and Electric Fire Pump by closing FW-456-V-037.

NOTE

This note applies to section [] 8.1.12

Station person at the 456-PI-008-025 and Diesel Fire Pump Controller Panel to record fire system pressure at 456-PI-008-025 when Diesel Fire Pump Controller Panel receives a start signal.

- [] 8.1.12. Start Diesel Fire Pump by slowly opening Inspector Test Valve FW-456-V-058. Diesel Fire Pump will start automatically when system pressure is decreased to 110 ± 3 psig. **This is a surveillance requirement.**
- [] 8.1.13. Record system pressure (456-PI-008-025) when Diesel Fire Pump Controller Panel receives a start signal. Acceptance Criteria is 107 psi to 113 psi. Notify the FSM if Acceptance Criteria is NOT met.

SIGN-OFF EST

- [] 8.1.14. Once pump has started, close Inspector Test Valve FW-456-V-058 and open FW-456-V-037 then allow pump to run for 30 minutes.

SIGN-OFF EST

- [] 8.1.15. Record time for engine to crank.

SIGN-OFF EST

8.1.16. Record time for engine to reach running speed.

SIGN-OFF EST

8.1.17. Observe the following during engine operation:

8.1.17.1. Oil pressure in normal range (28 – 60 psi).

SIGN-OFF EST

8.1.17.2. Speed indication in normal range (1750 -1825 RPM).

SIGN-OFF EST

8.1.17.3. Water temperature in normal range (165°- 185° F)

SIGN-OFF EST

8.1.17.4. Check the heat exchanger for cooling water flow.

SIGN-OFF EST

8.1.17.5. Steady dripping of water at packing glands.

SIGN-OFF EST

8.1.17.6. Proper suction pressure 456-PI-008-020(≈10 psi).

SIGN-OFF EST

8.1.17.7. Proper discharge pressures 456-PI-008-21 (≈150 psi).

SIGN-OFF EST

8.1.17.8. No oil, fuel and water leaks.

SIGN-OFF EST

8.1.17.9. No overheating of pump casing.

SIGN-OFF EST

8.1.18. **IF** overheating occurs, **THEN** perform the following:

8.1.18.1. Open cooling water bypass valve FW-456-V-046.

8.1.18.2. Close cooling water bypass valve after test is completed.

8.1.18.3. Notify CMR and initiate AR on overheating.

- 8.1.19. Verify FW-456-V-037 is open and the Jockey Pump and Electric Fire Pump are enabled.

SIGN-OFF EST

- 8.1.20. Notify FSM to EXIT LCO 3.1.2.

SIGN-OFF EST

- 8.1.21. After thirty minutes of run time, secure the diesel Fire pump by positioning the MAIN switch at the Diesel Fire Pump Controller 456-CP-008-02 to "OFF". Open FW-456-V-037.

- 8.1.22. Reset FAP alarms.

SIGN-OFF EST 8.2. RESTORATION

- 8.2.1. Notify CMR that testing and inspections are complete **AND** verify that alarms were received.

SIGN-OFF EST

- 8.2.2. Verify system is lined up for automatic operation per WP 04-FP1201 or as direct by FSM.

SIGN-OFF FACOP 8.3. RETEST

- 8.3.1. None required

 8.4. RESTORATION TO OPERATIONAL STATUS

- 8.4.1. Facility Shift Manager or designee conduct post-job review.

FIRE PUMP TEST FORM**PREREQUISITES**

| Section | Action | Initials |
|-----------|--|-------------------------------------|
| [] 7.1.1 | Before starting work, Facility Shift Manager or Designee conduct a pre-job safety meeting. | EST _____ EST _____ FSM _____ |

PERFORMANCE

| Section | Action | Initials |
|-------------|---|-----------|
| [] 8.1.2 | RCRA Deterioration Inspection: Inspect the fire pumps for cracks, erosion, salt buildup, damage, corrosion, loose or missing parts, malfunction or structural deterioration. Record deficiencies in comment section. | EST _____ |
| [] 8.1.3.1 | Record status of FAP Indicators and trouble lights next to FAP on data sheet. FIRE ALARM PANEL Power Light _____ On _____ Off Trouble light _____ On _____ Off Alarm lights _____ On _____ Off | EST _____ |
| [] 8.1.3.2 | South water tank level (at least 80% full). | EST _____ |
| [] 8.1.3.3 | North water tank level (at least 60% full). | EST _____ |
| [] 8.1.3.4 | Verify Jockey Pump is lined up for Automatic Operation by checking Breaker switch position and Controller Control switch position. Breaker Switch _____ ON _____ Off Controller Control _____ Hand _____ Off _____ Auto | EST _____ |
| [] 8.1.3.5 | Verify Electric Pump is lined up for Automatic Operation by checking Breaker Switch position and Power Light. Breaker Switch _____ ON _____ Off Power Light _____ On _____ Off | EST _____ |

| Section | Action | Initials |
|--------------|--|----------|
| [] 8.1.3.6 | Verify Diesel Fire Pump is lined up for Automatic Start-up by checking Main Switch Auto Light on front of Controller. Main Switch Auto Light Is ____ ON ____ Off | EST ____ |
| [] 8.1.3.7 | Verify following fire water valve position. FW-456-V-1 Locked Open ____ Closed ____ FW-456-V-2 Locked Open ____ Closed ____ FW-456-V-3 Locked Open ____ Closed ____ FW-456-V-4 Locked Open ____ Closed ____ FW-456-V-5 Locked Open ____ Closed ____ FW-456-V-6 Locked Open ____ Closed ____ FW-456-V-7 Locked Open ____ Closed ____ FW-456-V-12 Locked Open ____ Closed ____ FW-456-V-13 Locked Open ____ Closed ____ FW-456-V-14 Locked Open ____ Closed ____ FW-456-V-15 Locked Open ____ Closed ____ FW-456-V-16 Locked Open ____ Closed ____ FW-456-V-17 Locked Open ____ Closed ____ FW-456-V-19 Locked Open ____ Closed ____ FW-456-V-20 Locked Open ____ Closed ____ FW-456-V-21 Locked Open ____ Closed ____ FW-456-V-30 Locked Open ____ Closed ____ FW-456-V-78 Locked Open ____ Closed ____ | EST ____ |
| [] 8.1.3.27 | Diesel fuel tank valve (DF-456-V-051) is open. | EST ____ |
| [] 8.1.3.28 | Diesel fuel tank cap in place. | EST ____ |
| [] 8.1.3.29 | Diesel engine oil and coolant levels (in operating range). | EST ____ |
| [] 8.1.3.30 | Tightness of diesel engine speed control lock nuts (not loose). | EST ____ |
| [] 8.1.3.31 | Record hour meter reading on diesel engine _____(prior to test) | EST ____ |

| Section | Action | Initials |
|--------------|--|----------|
| [] 8.1.5 | Record system pressure (456-PI-008-025) when pump starts. _____ Acceptance Criteria is 117 psi to 123 psi. Notify the FSM if Acceptance Criteria is NOT met. Pass _____ Fail _____ | EST_____ |
| [] 8.1.6 | Record time when pump starts. _____ | EST_____ |
| [] 8.1.8 | Verify local fire alarm and CMR alarm, and then silence FAP. | EST_____ |
| [] 8.1.9.1 | Water flow from casing relief valve 456-PSV-008-007. | EST_____ |
| [] 8.1.9.2 | Steady dripping of water at packing glands. | EST_____ |
| [] 8.1.9.3 | Proper suction pressure from 456-PI-008-016 (\approx 10 psi). | EST_____ |
| [] 8.1.9.4 | Proper discharge pressure from 456-PI-008-017 (\approx 150 psi). | EST_____ |
| [] 8.1.9.5 | No pump casing overheating. | EST_____ |
| [] 8.1.9.6 | No unusual or abnormal conditions, such as noise or vibration. | EST_____ |
| [] 8.1.9.7 | Record time when Electric fire pump shuts off. _____ | EST_____ |
| [] 8.1.10 | Notify FSM to Enter LCO 3.1.2 – one fire pump inoperable. | EST_____ |
| [] 8.1.13 | Record system pressure (456-PI-008-025) when Diesel Fire Pump Controller Panel receives a start signal. _____ Acceptance Criteria is 107 psi to 113 psi. Notify the FSM if Acceptance Criteria is NOT met. Pass _____ Fail _____ | EST_____ |
| [] 8.1.14 | Once pump has started, close Inspector Test Valve FW-456-V-058 and open FW-456-V-037 then allow pump to run for 30 minutes. | EST_____ |
| [] 8.1.15 | Record time for engine to crank. _____ | EST_____ |
| [] 8.1.16 | Record time for engine to reach running speed. _____ | EST_____ |
| [] 8.1.17.1 | Oil pressure in normal range (28 – 60 psi). | EST_____ |
| [] 8.1.17.2 | Speed indication in normal range (1750 -1825 RPM). | EST_____ |

| Section | Action | Initials |
|--------------|---|-----------|
| [] 8.1.17.3 | Water temperature in normal range (165°- 185° F) | EST____ |
| [] 8.1.17.4 | Check the heat exchanger for cooling water flow. | EST____ |
| [] 8.1.17.5 | Steady dripping of water at packing glands. | EST____ |
| [] 8.1.17.6 | Proper suction pressure 456-PI-008-020(≈10 psi) | EST____ |
| [] 8.1.17.7 | Proper discharge pressures 456-PI-008-21 (≈150 psi). | EST____ |
| [] 8.1.17.8 | No oil, fuel, and water leaks. | EST____ |
| [] 8.1.17.9 | No overheating of pump casing. | EST____ |
| [] 8.1.19 | Verify FW-456-V-037 is open and the Jockey Pump and Electric Fire Pump are enabled. | EST____ |
| [] 8.1.20 | Notify FSM to EXIT LCO 3.1.2. | EST____ |
| [] 8.1.22 | Reset FAP alarms. | EST____ |
| [] 8.2.1 | Notify CMR that testing and inspections are complete AND verify that alarms were received. | EST____ |
| [] 8.2.2 | Verify system is line up for automatic operation per WP 04-FP1201 or as direct by FSM. | FACOP____ |

Comments:

PERSONNEL DATA

| PRINTED NAME | SIGNATURE | INITIALS | DATE/TIME |
|---------------------|------------------|-----------------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |