



Document Level: Functional Series
Document Number: Criterion 736 R2
Approval Date: 08/12/10
Effective Date: 09/10/10
Supersedes: Criterion 736 R1

**CONDUCT OF MAINTENANCE (P950)
OPERATIONS AND MAINTENANCE MANUAL
OPERATIONS & MAINTENANCE CRITERION**

TITLE: DRY STANDPIPE SYSTEMS

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DUSA CLASSIFICATION STATEMENT

The information contained in this document conforms to the official definition (including its specific exclusions) of the Construction and Facilities Engineering (CONST) Designated Unclassified Subject Area (DUSA), therefore it is exempt from classification and sensitive information review requirements.

Documents intended for public release must still be processed through the publication release section of the Classification Group.



RECORD OF REVISIONS

Revision No.	Date	Description
0	04/30/98	Initial Issue
1	09/12/02	<p>This revision reflects the conversion from a WordPerfect document into a Microsoft Word document and additional clarification on how to develop criteria. This revision includes:</p> <ul style="list-style-type: none"> • the addition of a Table of Contents, • the use of basis statements in Sections 6, 7, and 9, • revision to Section 9, “Required Documents,” and further clarification in the use of references.
2	7/30/2010	<p>Complete revision, including the following –</p> <ul style="list-style-type: none"> • Changes reflect current LANL organizations • Change reference to reflect P950, <i>Conduct of Maintenance</i> • Remove DOE O 430.1B references from Section 1 • Incorporate 2008 edition of NFPA 25, <i>Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems</i> • Incorporate 2010 edition of NFPA 72, <i>National Fire Alarm and Signaling Code</i> • Incorporate LASO action on cancellation and modification of 1999-era equivalencies to portions of NFPA 25 and 72 (LASO Memorandum No. SO:21WF-203741, <i>National Fire Protection Association 25 and National Fire Protection Association 72 Equivalency Cancellation/Modification</i>, January 19, 2010)



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CRITERION 736

DRY STANDPIPE SYSTEMS

1.0 PURPOSE

The purpose of this Criterion is to establish the minimum requirements and best practices for operation, maintenance and inspection of dry standpipe systems at LANL.

This document addresses the requirements of P 315, Conduct of Operations Manual, and P 950, Conduct of Maintenance, by defining the minimum operations and maintenance criteria for structures, systems and components (SSCs) that it covers. The Criterion lists requirements that are based on codes, standards, contract commitments, lessons learned and LASO direction on previous equivalencies to some NFPA 25 inspection, testing and maintenance (ITM) requirements. It also lists recommendations based on industry practices, operational experience or business case, where appropriate. Guidance for implementation of the requirements and recommendations is also provided.

Implementation of this Criterion satisfies the inspection, testing and maintenance (ITM) requirements of LANL PD 1220, *Fire Protection Program*, 10 CFR 851, *Worker Safety and Health Program*, Appendix A.2 “Fire Protection”, and DOE Order 420.1B, *Facility Safety*, Chapter II “Fire Protection”. Compliance with the NFPA codes herein are required per 10 CFR 851, Appendix A.2, and DOE O 420.1B Chapter II “Fire Protection,” both of which are required per the LANL Prime Contract as part of implementing a comprehensive fire protection program.

2.0 SCOPE

The scope of this Criterion includes the routine inspection, testing and preventive and predictive maintenance of dry standpipe systems at all nuclear and non-nuclear LANL facilities. The requirements contained within this Criterion are graded based in-part on the safety function assigned to the dry standpipe system, facility hazard categorization, and mission importance or “fire loss risk” associated with the facility. This Criterion does not address corrective maintenance actions required to repair or replace equipment.

3.0 ACRONYMS AND DEFINITIONS

3.1 Acronyms

AHJ	Authority Having Jurisdiction
CFR	Code of Federal Regulations
DOE	Department of Energy
DSA	Documented Safety Analysis
FOD	Facility Operations Director
LANL	Los Alamos National Laboratory
ITM	Inspection, Testing, and Maintenance

ML	Management Level
MM	Maintenance Manager
MSS	Maintenance and Site Services
NFPA	National Fire Protection Agency
NMED	New Mexico Environmental Department
NNSA	National Nuclear Security Administration
NOI	Notice of Intent
OM	Operations Manager
O&M	Operations and Maintenance
PD	Program Description
SC	Safety Class
SS	Safety Significant
SSC	Structure, Systems, and Components
TSR	Technical Surveillance Requirements

3.2 Definitions

Dry Pipe Standpipe System- A standpipe system with no permanently attached water supply that is designed to have piping contain water only when the system is being utilized through the fire department connection. (NFPA 14, Chapter 3.)

Management Level (ML1, ML2, ML3, ML4)- ML designation is used to grade the structures, systems, equipment, and components and associated activities based on their importance to the protection of the public, environment, and workers, security, and the Laboratory mission. See AP 341-502 for definitions of each ML level.

4.0 RESPONSIBILITIES

4.1 MSS-Division Leader (MSS-DL)

The Maintenance and Site Services (MSS) Division Leader (DL) receives and approves or rejects, in conjunction with the Authority Having Jurisdiction (AHJ), requests for variances from this Criterion. Maintains the record of decision for all variance requests.

4.2 MSS- Maintenance Programs (MSS-MP)

Responsible for the administrative content, and for monitoring applicability and implementation status of this Criterion. MSS-MP will assist organizations that are not applying or meeting the implementation expectations contained herein or will elevate their concerns to the appropriate level of LANL management.

4.3 Facility Operations Director (FOD)

Responsible for implementation of this O&M Criterion for identified systems/equipment within their facility boundaries.

4.4 Operations Manager (OM)

Responsible to the FOD for implementing operation portions of this Criterion and for coordinating transfer of systems/equipment to the Maintenance Manager for maintenance



activities. The OM with concurrence of the FOD will prioritize implementation within budget allocations.

4.5 Maintenance Manager (MM)

Responsible to the FOD and the MSS-Division Leader for implementing the maintenance portions of this Criterion and for coordinating the transfer of systems/equipment to the Operations Manager at the conclusion of maintenance activities. The MM with concurrence of the FOD will prioritize implementation within budget allocations.

4.6 Authority Having Jurisdiction (AHJ)

The AHJ is the LANL Fire Marshal, who is responsible for providing a decision on specific technical questions regarding the systems or equipment relevant to this Criterion.

The LANL Fire Marshal in conjunction with the MSS Division Leader is the approval authority for all exceptions and variances to this Criterion. The LANL Fire Marshal cannot approve deviations or exemptions to the Code of Federal Regulations (CFR), Department of Energy (DOE) Orders or National Fire Protection Association (NFPA) Codes and Standards. The fire protection AHJ for these matters is the Los Alamos Site Office (LASO) Manager per DOE Order 420.1B. (See PD 1220.)

5.0 PRECAUTIONS AND LIMITATIONS

5.1 Precautions

This section is not intended to identify all applicable precautions necessary for implementation of this Criterion. However, all applicable precautions should be contained in the implementing procedure(s) or work control authorization documents. The following precautions are intended only to assist the author of a procedure or work control document in the identification of hazards and precautions that may not be immediately obvious.

The discharge of large quantities of water (>5,000 gal) from a fire protection system may require the issuance of a Notice of Intent (NOI) to discharge this and greater quantities of water up to 3 weeks prior to the evolution to meet LANL commitments with the New Mexico Environmental Department (NMED). NOIs must be coordinated with the LANL Environmental Protection Division.

5.2 Limitations

The intent of this Criterion is to identify the minimum requirements and recommendations for structures, systems, and components (SSCs) operation and maintenance across the Laboratory. Each Criterion user is responsible for the identification and implementation of additional facility specific requirements and recommendations based on their authorization basis and unique equipment and conditions, (e.g., equipment history, manufacturer warranties, operating environment, manufacturer O&M requirements and guidance, etc.)

Nuclear facilities and moderate to high hazard non-nuclear facilities will typically have additional facility-specific requirements beyond those presented in this Criterion. Nuclear facilities should implement the requirements of DOE Order 433.1A, *Maintenance Management Program for DOE Nuclear Facilities* as the minimum programmatic requirements for a maintenance program. Additional requirements and recommendations for SSC operation and maintenance may be

necessary to fully comply with the current DOE Order or the Code of Federal Regulations (CFR) as applicable.

Nuclear facilities, certain high hazard facilities and explosives facilities may have additional facility specific requirements beyond those presented in this Criterion which are contained in the Documented Safety Analysis (DSA), Technical Safety Requirements (TSRs), or facility safety plans, as applicable.

6.0 REQUIREMENTS

Minimum requirements for all users are specified in this section. Requested variances to these requirements shall be prepared and submitted to MSS-MP and FP-DO for review and approval. The MSS-DL and LANL Fire Marshal approve or deny variances. The Criterion users are responsible for analysis of operational performance and SSC replacement or refurbishment based on this analysis. Laws, codes, contractual requirements, engineering judgment, safety matters, and operations and maintenance experience drive the requirements contained in this section.

The requirements specified in this section are presented in a graded approach based on codes and standards (primarily NFPA 25), contract commitments, lessons learned and LASO direction on previous equivalencies to some NFPA 25 and 72 ITM requirements.

In negotiation with LASO, FP-DO maintains the list of facilities designated as “high value” facilities for the purposes of this Criterion.

Note: Discovery of SSC with a degraded or non-conforming condition is a triggering input to the Operability Determination and Functional Assessment process defined in AP-341-516, *Operability Determination and Functionality Assessment*. Degraded or non-conforming conditions include, but are not limited to, failed equipment or components, unsatisfactory readings, code or standard violations and fire protection impairments. Personnel performing tests or inspections under this O&M Criterion are not responsible nor authorized to perform the Operability Determination. Any degraded or non-conforming condition discovered under this O&M Criterion shall be communicated to the FOD Representative for input to the AP-341-516 process. While that process may not apply in Low Hazard Non-Nuclear and Office facilities, the same concept applies. The FOD organization is responsible to determine the response (taking equipment out of service, establishing fire watches, limiting operations, etc.) to SSC degraded and non-conforming conditions.

6.1 Operations Requirements

6.1.1 Baseline Operational Checklist

The dry standpipe system must be operational at all times. The dry standpipe system shall be deemed operational when the following conditions exist:

1. The Fire Department Connection (FDC) is available for connection to the water source and is in good repair with hose connection valves closed and operational.
2. The system hose connection valves are in their required locations, operational and in good repair and are arranged so that hoses can be connected.

3. An adequate supply of water and pressure is available from the fire department pumper(s) to supply the system at its required volume and pressure.
4. The system's piping, fittings, hangers and bracing are in good repair.

Basis: NFPA 14 (2010 Edition), *Standard for the Installation of Standpipe, Private Hydrant and Hose Systems*, and NFPA 25 (2008 Edition), *Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems*.

6.1.2 Nuclear Facilities, High-Hazard Non-nuclear Facilities and "High Value" Facilities

The following are operations/visual inspection requirements for dry standpipe systems protecting LANL nuclear facilities (be they SC, SS or defense in-depth), high-hazard non-nuclear facilities, and other "high fire loss risk" facilities.

6.1.2.1 Monthly Inspections

If applicable, visually inspect all system control valves to ensure the following :

1. valves are in correct position,
2. valves are locked, or supervised,
3. valves are accessible,
4. valves have appropriate identification, including the system or portion of a system they control

Note: Dry standpipe systems at LANL are typically not provided with system control valves.

Basis: NFPA 25(2008 Edition) *Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems*, Chapter 6, Table 6.1.

6.1.2.2 Quarterly Inspections

1. Where provided, alarm devices (pressure and flow switches, valve supervision switches, etc.) are inspected to ensure they are free of physical damage.
2. Where provided, the hydraulic nameplate/placard is inspected to verify that it is securely attached to the sprinkler riser (or other approved location) and is legible.
3. Where provided, pressure reducing valves, including pressure relief devices, are inspected to verify the valves are in the open position, not leaking, in good condition (hand wheels installed and not broken), and that downstream pressures are being maintained as designed.

Note: Other than TA-3-4100, dry standpipe systems at LANL are typically not provided with pressure reducing or relieving valves.

4. Fire department connection (FDC) is inspected to verify, if applicable:
 - a. The FDC is visible and accessible,
 - b. Couplings and swivels are not damaged and rotate smoothly,
 - c. Plugs or caps are in-place and in good condition,
 - d. Identification signs are in-place,

- e. The check valve is not leaking,
- f. The FDC internal clapper(s) is in-place and operating properly.

If FDC plugs or caps are not in-place, the interior of the connection shall be inspected for obstructions, and it shall be verified that the FDC clapper(s), if installed, is functional over its full range.

Basis: NFPA 25 (2008 Edition), *Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems*, Chapter 6, Table 6.1.

6.1.2.3 Annual Inspections

1. From floor level, standpipe system piping and fittings are inspected to verify that these are in good condition and free of mechanical damage, leakage, corrosion, or subject to external loads by materials either resting on the pipe or supported by the pipe or pipe supports (e.g., cabling strapped to piping).

Note: Pipe and fittings installed within concealed spaces not visible from floor level need not be inspected. Pipe and fittings installed within areas that are inaccessible for safety considerations due to process operations are inspected during each scheduled shutdown or outage.

2. From floor level, standpipe system pipe hangers and seismic bracing are inspected to verify that these are in good condition and free of mechanical damage, leakage, corrosion, or subject to external loads by materials either resting on the pipe or supported by the pipe or pipe supports (e.g., cabling strapped to hangers or bracing).

Note: Hangers and seismic bracing installed within concealed spaces not visible from floor level need not be inspected. Hangers and seismic bracing installed within areas that are inaccessible for safety considerations due to process operations are inspected during each scheduled shutdown or outage.

3. Hose Connections
 - a. Verify caps are not missing
 - b. Verify fire hose connection is not damaged
 - c. Verify valve handle(s) are in good condition and not damaged
 - d. If applicable, verify internal cap gasket is not missing or deteriorated
 - e. Verify there are no visible obstructions that would impede access to the hose connections
 - f. Verify that pressure restricting device are not missing

Basis: NFPA 25 (2008 Edition), *Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems*, Chapter 6, Table 6.1.

6.1.2.4 Testing Requirements - Quarterly

Where provided, test mechanical waterflow devices. Mechanical waterflow devices, including water motor gongs, are tested by flow through a test connection or remote hose connection.

Note: These devices are not usually provided on dry standpipe systems at LANL.

Basis: NFPA 25 (2008 Edition), *Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems*, Chapter 6, Table 6.1.

6.1.2.5 Testing Requirements - Semi-Annually

1. Where provided, vane-type and pressure switch-type waterflow devices are tested by flow through the test connection or remote hose connection valve. Verify the proper alarm signal is generated at the fire alarm control panel and proprietary fire alarm monitoring system.

Note: These devices are not usually provided on dry standpipe systems at LANL.

2. Valve supervisory switches are tested by operating the monitored valve. A supervisory alarm signal must be generated and transmitted to the alarm monitoring station either during the first two revolutions of a hand wheel or when the stem of the valve has moved one-fifth of the distance from its normal position.

Note: These devices are not usually provided on dry standpipe systems at LANL.

Basis: NFPA 25 (2008 Edition), *Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems*, Chapter 6, Table 6.1.

6.1.2.6 Testing Requirements - Every 5 years

1. Conduct a flow test by flowing the required volume of water at the hydraulically most remote, highest, or dead-end hose connection of each zone of the standpipe system. When a flow test of the hydraulically most remote outlet is not practical, consult FP-DO for a more appropriate location for the test. Use the original design basis flow and pressure requirements in effect at the time of the installation for all testing. FP-DO must approve test method(s) and performance criteria in advance.

2. Where provided, test pressure reducing valves and pressure control valves.

Note: Other than TA-3-4100, dry standpipe systems at LANL are typically not provided with pressure reducing or relieving valves.

3. Hydrostatically test the system for two hours at 200 psi (for systems with maximum pressure of 150 or below) or for two hours at 50 psi greater than maximum pressure (for systems with maximum pressure greater than 150 psi.)
4. Clean, repair, or replace internal components as necessary in accordance with the manufacturer's instructions.
5. Following flow testing, open all drain valves to remove water trapped within the system.

Basis: NFPA 25 (2008 Edition), *Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems*, Chapter 6, Table 6.1.

6.1.3 Facilities that are not Nuclear Facilities, High-Hazard Non-nuclear Facilities or "High Value" Facilities

The following are operations/visual inspection requirements for dry standpipe systems protecting LANL facilities that are not nuclear facilities, high-hazard non-nuclear facilities, or designated as "high value" facilities.

6.1.3.1 Quarterly Inspections

Where provided, pressure reducing valves, including pressure relief devices, are inspected to verify the valves are in the open position, not leaking, in good condition (hand wheels installed and not broken).

Note: Other than TA-3-4100, dry standpipe systems at LANL are typically not provided with pressure reducing or relieving valves.

Inspect the fire department connection (FDC) to verify the following, if applicable:

1. The FDC is visible and accessible,
2. Couplings and swivels are not damaged and rotate smoothly,
3. Plugs or caps are in-place and in good condition,
4. Identification signs are in-place,
5. The check valve is not leaking,
6. The FDC internal clapper(s) is in-place and operating properly.

If FDC plugs or caps are not in place, inspect the interior of the connection for obstructions, and verify that the FDC clapper(s), if installed, is functional over its full range.

Basis: NFPA 25 (2008 Edition), *Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems*, Chapter 6, Table 6.1.

6.1.3.2 Semi Annual Inspections

If applicable, visually inspect all system control valves to ensure the following :

1. valves are in correct position,
2. valves are locked, or supervised,
3. valves are accessible,
4. valves have appropriate identification, including the system or portion of a system they control

Note: Dry standpipe systems at LANL are typically not provided with system control valves.

5. Where provided, alarm devices (pressure and flow switches, valve supervision switches, etc.) are inspected to ensure they are free of physical damage.
6. Where provided, inspect the hydraulic nameplate/placard to verify that it is securely attached to the sprinkler riser (or other approved location) and is legible.

Basis: NFPA 25 (2008 Edition), *Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems*, Chapter 6, Table 6.1.

6.1.3.3 Annual Inspections

1. From floor level, verify the standpipe system piping and fittings are in good condition and free of mechanical damage, leakage, corrosion, or subject to external loads by

materials either resting on the pipe or supported by the pipe or pipe supports (e.g., cabling strapped to piping).

Note: Pipe and fittings installed within concealed spaces not visible from floor level need not be inspected. Pipe and fittings installed within areas that are inaccessible for safety considerations due to process operations are inspected during each scheduled shutdown or outage.

2. From floor level, verify the standpipe system pipe hangers and seismic bracing are in good condition and free of mechanical damage, leakage, corrosion, or subject to external loads by materials either resting on the pipe or supported by the pipe or pipe supports (e.g., cabling strapped to hangers or bracing).

Note: Hangers and seismic bracing installed within concealed spaces not visible from floor level need not be inspected. Hangers and seismic bracing installed within areas that are inaccessible for safety considerations due to process operations are inspected during each scheduled shutdown or outage.

3. Hose Connections
 - a. Verify caps are not missing.
 - b. Verify fire hose connection is not damaged.
 - c. Verify valve handle(s) are in good condition and not damaged.
 - d. If applicable, verify internal cap gasket is not missing or deteriorated.
 - e. Verify there are no visible obstructions that would impede access to the hose connections.
 - f. Verify that pressure restricting device are not missing.

Basis: NFPA 25 (2008 Edition), *Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems*, Chapter 6, Table 6.1.

6.1.3.4 Testing Requirements – Semi-Annually

1. Where provided, test mechanical waterflow devices. Mechanical waterflow devices, including water motor gongs, are tested by flow through a test connection or remote hose connection

Note: These devices are not usually provided on dry standpipe systems at LANL.

2. Where provided, test vane-type and pressure switch-type waterflow devices by flow through the test connection or remote hose connection valve. Verify the proper alarm signal is generated at the fire alarm control panel and proprietary fire alarm monitoring system.

Note: These devices are not usually provided on dry standpipe systems at LANL.

3. Test valve supervisory switches by operating the monitored valve. A supervisory alarm signal must be generated and transmitted to the alarm monitoring station either during the first two revolutions of a hand wheel or when the stem of the valve has moved one-fifth of the distance from its normal position.

	<p style="text-align: center;">Conduct of Maintenance (P 950) Operations and Maintenance Manual Dry Standpipe Systems</p>	<p style="text-align: right;">Criterion 736, R2 Page 12 of 18</p>
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Note: These devices are not usually provided on dry standpipe systems at LANL.

Basis: NFPA 25 (2008 Edition), *Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems*, Chapter 6, Table 6.1.

6.1.3.5 Testing Requirements - Every 5 years

1. Conduct a flow test by flowing the required volume of water at the hydraulically most remote, highest, or dead-end hose connection of each zone of the standpipe system. When a flow test of the hydraulically most remote outlet is not practical, consult FP-DO for a more appropriate location for the test. Use the original design basis flow and pressure requirements in effect at the time of the installation for all testing. FP-DO must approve test method(s) and performance criteria in advance.

2. Where provided, test pressure reducing valves and pressure control valves.

Note: Other than TA-3-4100, dry standpipe systems at LANL are typically not provided with pressure reducing or relieving valves.

3. Hydrostatically test the system for two hours at 200 psi (for systems with maximum pressure of 150 or below) or for two hours at 50 psi greater than maximum pressure (for systems with maximum pressure greater than 150 psi.)
4. Clean, repair, or replace internal components as necessary in accordance with the manufacturer's instructions.
5. Following flow testing, open all drain valves to remove water trapped within the system.

Basis: NFPA 25 (2008 Edition), *Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems*, Chapter 6, Table 6.1.

6.2 Maintenance Requirements

The following are maintenance requirements for all dry standpipe systems protecting LANL facilities; no distinction is made for facility hazard categorization or "high value." Ensure all system components are working. Repair or replace any components that fail a test or inspection in accordance with the manufacturer's instructions.

6.2.1 Valves

1. Where provided, annually lubricate the operating stems of outside screw and yoke (OS&Y) valves. Then close and reopen the valve completely to test its operation and to distribute of the lubricant. Graphite lubricant is recommended.
2. Clean, repair, or replace internal components in all system valves as necessary in accordance with the manufacturer's recommendations.

Basis: NFPA 25 (2008 Edition), *Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems*, Chapter 6, Table 6.1.

6.2.2 Dry Standpipe Systems

1. Refer to Appendix A: Inspection of Dry Standpipe Systems in this Criterion, for a description of suggested maintenance activities.

2. Provide additional maintenance as recommended by the manufacturer's instructions for all components of standpipe systems.

Basis: NFPA 14 (2010 Edition), *Standard for the Installation of Standpipe, Private Hydrant and Hose Systems*, Chapter 3.

6.2.3 5-Year Maintenance

1. Gauges are replaced or tested by comparison with a calibrated gauge. Gauges not accurate to within 3% of the full scale are replaced or recalibrated.
2. Where provided, check valves are internally inspected and cleaned/repared in accordance with manufacturer's instructions.

Basis: NFPA 25 (2008 Edition), *Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems*, Chapter 6, Table 6.1.

6.3 Impairments and Modifications

1. If one or more of the operational requirements listed in Section 6.1.1 above are not maintained, follow the actions outlined in Criterion 733, *Fire Protection System Impairment Control Program*.
2. Following maintenance/repair work to the system pressure boundary or flow path, and prior to returning the affected dry standpipe system to service, perform visual inspections, flushing and hydrostatic testing as described in this document above.
3. Following modifications to the pressure boundary or flow path of the dry standpipe system, and prior to returning the system to service, perform visual inspections, flow test, and hydrostatic testing as described in this document above.
4. Following modifications to any other portion of the dry standpipe system, and prior to returning the system to service, perform visual inspections as described in this document above.

6.4 Personnel Requirements

Operational testing and alarm verification will be conducted by MSS personnel, in compliance with PD 1220.

Basis: PD 1220, Fire Protection Program

7.0 RECOMMENDED AND GOOD PRACTICES

The information provided in this section is recommended based on acceptable industry practices and should be implemented by each user based on the unique application and operating history of the subject systems/equipment.

7.1 Operations Recommendations

None.

7.2 Maintenance Recommendations

Persons other than MSS Fire Protection Maintenance personnel may conduct visual inspection requirements identified in this document.

Basis: PD 1220, Fire Protection Program

8.0 GUIDANCE

8.1 Operations Guidance

None.

8.2 Maintenance Guidance

None.

9.0 REQUIRED DOCUMENTATION

Maintenance history shall be maintained by the FM for dry standpipe systems to include, as a minimum, the parameters listed in the Table 9-1 below:

Table 9-1: Maintenance History Documentation Parameters				
Parameter	ML 1	ML 2	ML 3	ML 4
Maintenance Activities				
Repair / Adjustments	Required	Required	Required	Required
PM Activities	Required	Required	Required	Required
Equipment Problems				
Failure Dates	Required	Required	Required	Required
Failure Root Cause	Required	Required	Required	Required
Inspection Results				
Inspection Date	Required	Required	Required	Required
SSC Condition	Required	Required	Required	Required
<i>'-' indicates documentation is not required.</i>				

Basis: Documentation of the parameters listed in Table 9-1 above satisfies the requirements of P 950, Section 3.5.15 which states, “A maintenance history and trending program is maintained to document data, provide historical information for maintenance planning, and support maintenance and performance trending of facility systems and components”

10.0 REFERENCES

The following references, and associated revisions, were used in the development of this document.

10.10 10 CFR 851, *Worker Safety and Health Program*, Appendix A.2 “Fire Protection”

10.11 AP-341-502, *Management Level Determination*

10.12 AP-341-516, *Operability Determination and Functionality Assessment*

- 10.13** AP-MNT-010, *Maintenance History*
- 10.14** DOE Order 430.1B, *Real Property Asset Management*
- 10.15** DOE Order 420.1B, *Facility Safety*, Chapter II “Fire Protection”
- 10.16** DOE Order 433.1A, *Maintenance Management Program for DOE Nuclear Facilities*
- 10.17** LANL Equivalency to NFPA 25 consists of:
 - (a) LANL Memorandum No. FE-21-98-005, *Proposed Equivalency to NFPA Standard 25*, dated June 9, 1998;
 - (b) DOE AOO/LAOO Memorandum No. LAAMFO:3TR-021, *Fire Protection Inspection, Test, and Maintenance Requirements*, dated June 9, 1998; and
 - (c) DOE AOO Memorandum No. T ASD:98-068:pc, *Disposition of LANL Equivalency Requests to NFPA 25 – Inspection, Testing, and Maintenance (ITM) Frequencies for Water-Based Fire Protection Systems*, dated July 24, 1998
- 10.18** LASO Memorandum No. SO:21WF-203741, *National Fire Protection Association 25*
- 10.19** National Fire Protection Association *72 Equivalency Cancellation/Modification*, January 29, 2010
- 10.20** NFPA 14, 2010 Edition, *Standard for the Installation of Standpipe, Private Hydrant and Hose Systems*
- 10.21** NFPA 25, 2008 Edition, *Standard for the Inspection, Testing and Maintenance of Water-based Fire Protection Systems*
- 10.22** P 315, *Conduct of Operations Manual*
- 10.23** P 950, *Conduct of Maintenance*
- 10.24** PD 1220, *Fire Protection Program*

11.0 APPENDICES

- Appendix A. *Inspection of Dry Standpipe Systems*
- Appendix B. *Testing Requirements*



APPENDIX A
INSPECTION AND TESTING OF DRY STANDPIPE SYSTEMS

CHECK POINTS	CORRECTIVE ACTION
HOSE VALVE OUTLETS	
1. Cap missing	1. Replace
2. Hose connection damaged	2. Repair
3. Valve handles missing	3. Replace
4. Gaskets missing/deteriorated	4. Replace
5. Visible obstructions	6. Remove
PIPING	
1. Piping damaged	1. Repair
2. Control valves damaged	2. Repair/Replace
3. Pipe support device missing or damaged	3. Repair/Replace
4. Supervisory devices damaged	4. Repair/Replace
CABINET	
1. Check overall condition	1. Repair or replace parts as necessary
2. Difficult to open	2. Repair
3. Door will not fully open	3. Repair or remove obstructions
4. Door glazing cracked/broken	4. Replace
5. Not identified as containing fire equipment	5. Provide identification
6. Visible obstructions	6. Remove
7. Not all valves are easily accessible	7. Remove non-fire related materials
PRESSURE REGULATING VALVES (if applicable)	
1. Valves are in the incorrect position.	1. Place in correct position
2. Valves are leaking.	2. Repair
3. Valves are not in good condition	3. Repair or replace

APPENDIX B

TESTING REQUIREMENTS

- 5 year: Test per NFPA 25. Initially and every five years thereafter, conduct a flow test by flowing the required volume of water at the hydraulically most remote, highest, or dead-end hose connection of each zone of the standpipe system. When not practical, consult FP-DO for a more appropriate location for the test.
- Flush/test per NFPA 25. Initially, and prior to return of any repaired or modified system to service, perform the following:
- * Flush piping at not less than the water demand rate of the system.
 - * Hydrostatically test the system at not less than 200 psi for 2 hours, or 50 psi in excess of maximum pressure (where maximum pressure exceeds 150 psi).