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Initial Issue

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This ICN to the document deletes the contents of section 1.4, adds Section 2 to the document, updates previous references, and makes other minor editorial changes as marked.

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SUMMARY

The Site Fire Protection System provides the capability to detect, control, and extinguish fires, and/or mitigate explosions throughout the Monitored Geologic Repository (MGR) with the exception of the Waste Handling Building (WHB), Waste Treatment Building (WTB), Carrier Preparation Building (CPB), and the Subsurface Facility (SSF). This system provides fire protection and fire alarm monitoring capability for the balance of plant area facilities such as security station, administration building, medical center, etc. and for facilities located at the South Portal. Fire protection systems in the WHB, WTB, CPB, and SSF will provide fire protection for these areas and receive their fire protection water supply from the Site Fire Protection System.

The Site Fire Protection System includes water-based and non-water-based suppression as appropriate. The system includes storage facilities for fire suppression agents and distribution and delivery of fire suppression agents in surface areas/facilities except for the WHB, WTB, CPB, and the SSF. The system also provides the facilities (storage space) and fixed equipment for the site fire response organization, including signal monitoring, retransmission, and annunciation, which are distributed site-wide. The Site Fire Protection System includes fire or explosion detection panel(s) as appropriate and suppression system actuation.

The Site Fire Protection System interfaces with the fire protection systems of the WHB, WTB, CPB, and SSF fire protection systems for signal monitoring and retransmission and water distribution. The Site Fire Protection System provides the sole interface with the Monitored Geologic Repository Operations Monitoring and Control System for all fire related status, control signals, and annunciation. The Site Fire Protection System interfaces with the Site Electrical Power System for power to operate.

QUALITY ASSURANCE

The quality assurance (QA) program applies to the development of this document. The "SDD Development/Maintenance (Q SDDs) (WP# 16012126M5)" activity evaluation has determined the development of this document to be subject to DOE/RW-0333P "Quality Assurance Requirements and Description" requirements. This document was developed in accordance with AP-3.11Q, "Technical Reports."

1. SYSTEM FUNCTIONS AND DESIGN CRITERIA

The functions and design criteria for the system are identified in the following sections. Throughout this document the term “system” shall be used to indicate the Site Fire Protection System. The system architecture is provided in Appendix B.

1.1 SYSTEM FUNCTIONS

- 1.1.1 The system provides the means for detection and annunciation of fires.
- 1.1.2 The system provides the means to control, minimize the propagation, and extinguish fires.
- 1.1.3 The system provides fire protection water storage and distribution.
- 1.1.4 The system delivers fire suppressants (water and other agents) within the surface areas/facilities other than the WHB, WTB, CPB, and SSF.
- 1.1.5 The system provides the means to detect, control, and mitigate credible explosion hazards except for the WHB, WTB, CPB, and the SSF.
- 1.1.6 The system provides occupant notification of fire emergency conditions within surface facilities except for the WHB, WTB, CPB, and SSF.
- 1.1.7 Reserved
- 1.1.8 The system provides fire protection signals to support site (surface and subsurface facilities) fire alarm requirements.
- 1.1.9 The system provides equipment, storage, and training facilities for manual fire fighting.

NOTE: Design criteria related to this function will be provided in a later version of this document.

- 1.1.10 The system completes fire barriers where penetrations exist.

1.2 SYSTEM DESIGN CRITERIA

This section presents the design criteria for the system. Each criterion in this section has a corresponding Criterion Basis Statement in Appendix A that describes the need for the criterion as well as a basis for the performance parameters imposed by the criterion. Each criterion in this section also contains bracketed traces indicating traceability, as applicable, to the functions (F) in Section 1.1, the “Monitored Geologic Repository Requirements Document” (MGR RD), and “Revised Interim Guidance Pending Issuance of New U.S. |

Nuclear Regulatory Commission (NRC) Regulations (Revision 01, July 22, 1999), for Yucca Mountain, Nevada.” In anticipation of the interim guidance being promulgated as a Code of Federal Regulations, it will be referred to as “10 CFR 63” in this system description document. For the applicable version of the codes, standards, and regulatory documents, refer to Appendix E.

1.2.1 System Performance Criteria

1.2.1.1 The system shall provide an effective level of fire protection or explosion mitigation based on the fire/explosion hazards and occupancy classification identified in the site fire hazards analysis (FHA).

[F 1.1.2, 1.1.4, 1.1.5][MGR RD 3.1.G]

1.2.1.2 The system shall provide automatic fire suppression in facilities that have a ground floor area in excess of 5,000 square feet, or where the maximum fire loss exceeds \$1 million.

NOTE: Other circumstances where the maximum possible fire loss is less than \$1 million or the facility has a ground floor area less than 5,000 square feet may warrant the use of automatic fire suppression (e.g., required for protection of human life, high public visibility and sensitivity).

[F 1.1.2, 1.1.4][MGR RD 3.1.G]

1.2.1.3 The system shall provide redundant fire protection in areas where the maximum possible fire loss exceeds \$50 million.

[F 1.1.2, 1.1.4][MGR RD 3.1.G]

1.2.1.4 The system shall be designed to provide adequate fire protection independent of off-site (non-MGR) fire response organizations.

[F 1.1.2, 1.1.4]

1.2.1.5 Reserved.

1.2.1.6 The portion of the system that supports surface facilities shall have an operational life (maintainable service life) of up to 40 years.

[MGR RD 3.2.C]

1.2.1.7 The system shall include provisions that support a deferral of closure for up to 300 years.

[MGR RD 3.2.H]

1.2.1.8 The system shall provide penetration seal designs that meet the fire barrier rating of the applicable fire barrier.

[F 1.1.10][MGR RD 3.3.A]

1.2.2 Safety Criteria

1.2.2.1 Nuclear Safety Criteria

There are no nuclear safety criteria for this system.

1.2.2.2 Non-nuclear Safety Criteria

1.2.2.2.1 The system shall provide local visual and audible alarms and alarm and trouble annunciation in the Central Control Center and the Security Central Alarm Station.

[F 1.1.1, 1.1.6][MGR RD 3.1.G]

1.2.2.2.2 The system shall provide manual alarm stations in accessible locations within fire areas or other approved subdivisions.

[F 1.1.6][MGR RD 3.1.G]

1.2.2.2.3 The system shall ensure fire-fighting equipment is plainly marked, easily accessible, and conspicuously located.

[MGR RD 3.1.G]

1.2.2.2.4 Fire protection system and components shall not be susceptible to loss of primary power.

[F 1.1.1, 1.1.8][MGR RD 3.3.A]

1.2.2.2.5 The system shall be designed so that the failure of any one component (active equipment or control device) will not disable the entire system.

[MGR RD 3.1.G]

1.2.2.2.6 The system shall provide a fire main loop to permit isolation of an impairment without simultaneously interrupting the fire protection water supply to the entire site.

[MGR RD 3.3.A]

1.2.3 System Environmental Criteria

1.2.3.1 The system components that are exposed to outside wind conditions shall be designed for a maximum wind speed of 121 miles per hour.

[MGR RD 3.3.A]

1.2.3.2 The system components that are exposed to the outside temperature environment shall be designed to a temperature of 5 degrees F to 117 degrees F.

[MGR RD 3.3.A]

- 1.2.3.3 The system shall be designed for the ambient relative humidity environment defined in Table 1.

Table 1. Ambient Relative Humidity Environment

Parameter	Value
Annual mean value	28%
Minimum summer mean value	13%
Maximum winter mean value	46%

[MGR RD 3.3.A]

1.2.4 System Interface Criteria

- 1.2.4.1 The system shall interface with the conventional quality ventilation systems (which excludes the WHB, CPB, WTB, and SSF) to ensure effective smoke detection and smoke control.

[F 1.1.1]

- 1.2.4.2 The system shall receive normal and standby electrical power from the Site Electrical Power System.

[F 1.1.1, 1.1.3]

- 1.2.4.3 The system shall provide signals for fire detection, fire alarm, fire suppression components, and loss of system supervision using negotiated signal protocol to/from the Waste Handling Building Fire Protection System.

[F 1.1.8]

- 1.2.4.4 The system shall provide signals for fire detection, fire alarm, fire suppression components, and loss of system supervision using negotiated signal protocol to/from the Waste Treatment Building System.

[F 1.1.8]

- 1.2.4.5 The system shall provide signals for fire detection, fire alarm, fire suppression components, and loss of system supervision using negotiated signal protocol to/from the Carrier Preparation Building System.

[F 1.1.8]

- 1.2.4.6 The system shall provide signals for fire detection, fire alarm, fire suppression components, and loss of system supervision using negotiated signal protocol to the Monitored Geologic Repository Operations Monitoring and Control System.

[F 1.1.1, 1.1.8][MGR RD 3.1.G]

- 1.2.4.7** The system shall provide signals for fire detection, fire alarm, fire suppression components, and loss of system supervision using negotiated signal protocol to/from the Subsurface Facility Fire Protection System.
[F 1.1.8]
- 1.2.4.8** The system shall interface with Site Water System for water supply to the fire water tanks.
- 1.2.4.9** The system shall deliver fire protection water at the required flow rates, pressures, and duration to the Subsurface Fire Protection System.
[F 1.1.3][MGR RD 3.1.G]
- 1.2.4.10** The system shall deliver fire protection water at the required flow rates, pressures, and duration to the Waste Treatment Building System.
[F 1.1.3][MGR RD 3.1.G]
- 1.2.4.11** The system shall deliver fire protection water at the required flow rates, pressures, and duration to the Carrier Preparation Building System.
[F 1.1.3][MGR RD 3.1.G]
- 1.2.4.12** The system shall deliver fire protection water at the required flow rates, pressures, and duration to the Waste Handling Building Fire Protection System.
[F 1.1.3][MGR RD 3.1.G]
- 1.2.5** **Operational Criteria**
There are no operational criteria for this system.
- 1.2.6** **Codes and Standards**
- 1.2.6.1** The system shall comply with the applicable provisions of “Occupational Safety and Health Standards” (29 CFR 1910).
[MGR RD 3.1.E]
- 1.2.6.2** The system shall comply with the applicable provisions of “Safety and Health Regulations for Construction” (29 CFR 1926).
[MGR RD 3.1.F]
- 1.2.6.3** The system shall comply with the applicable provisions of “Facility Safety” (DOE Order 420.1), and “Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program.” For requirements governed by both the NRC and DOE Order 420.1, NRC requirements take precedence.
[MGR RD 3.1.G]

- 1.2.6.4** The system shall comply with the applicable provisions of “Standard for Portable Fire Extinguishers” (NFPA 10).
[MGR RD 3.1.G]
- 1.2.6.5** The system shall comply with the applicable provisions of “Standard for the Installation of Sprinkler Systems” (NFPA 13).
[F 1.1.4][MGR RD 3.1.G]
- 1.2.6.6** The system shall comply with the applicable provisions of “Standard for Water Spray Fixed Systems for Fire Protection” (NFPA 15).
[F 1.1.4][MGR RD 3.1.G]
- 1.2.6.7** The system shall comply with the applicable provisions of “Standard for the Installation of Stationary Pumps Fire Protection” (NFPA 20).
[MGR RD 3.1.G]
- 1.2.6.8** The system shall comply with the applicable provisions of “Standard for Water Tanks for Private Fire Protection” (NFPA 22).
[F 1.1.3][MGR RD 3.1.G]
- 1.2.6.9** The system shall comply with the applicable provisions of “Standard for the Installation of Private Fire Service Mains and Their Appurtenances” (NFPA 24).
[F 1.1.3][MGR RD 3.1.G]
- 1.2.6.10** The system shall comply with the applicable provisions of “Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems” (NFPA 25).
[F 1.1.3][MGR RD 3.1.G]
- 1.2.6.11** The system shall comply with the applicable provisions of “Standard on Explosion Prevention Systems” (NFPA 69) and “Guide for Venting of Deflagrations” (NFPA 68).
[F 1.1.5][MGR RD 3.1.G]
- 1.2.6.12** The system shall comply with the applicable provisions of “National Fire Alarm Code” (NFPA 72).
[F 1.1.6, 1.1.8][MGR RD 3.1.G]
- 1.2.6.13** The system shall comply with the applicable provisions of “Standard for the Installation of Air Conditioning and Ventilating Systems” (NFPA 90A).
[MGR RD 3.1.G]

- 1.2.6.14** The system shall comply with the applicable provisions of “Standard for the Installation of Lightning Protection Systems” (NFPA 780).
[MGR RD 3.1.G]
- 1.2.6.15** The system shall comply with the applicable provisions of “Standard for Fire Protection for Facilities Handling Radioactive Materials” (NFPA 801).
[MGR RD 3.1.G]
- 1.2.6.16** The system shall comply with the applicable provisions of “Standard for Fire Hose Connections” (NFPA 1963).
[MGR RD 3.1.G]
- 1.2.6.17** The system shall comply with the applicable provisions of “Life Safety Code” (NFPA 101).
[MGR RD 3.1.G]
- 1.2.6.18** The system shall comply with the applicable assumptions contained in the “Monitored Geologic Repository Project Description Document.”
- 1.2.6.19** The system shall comply with the applicable provisions of “Standard for the Installation of Standpipe and Hose Systems” (NFPA 14).
[MGR RD 3.1.G]
- 1.2.6.20** The system shall comply with the applicable provisions of “Human Factors Design Guidelines for Maintainability of Department of Energy Nuclear Facilities” (UCRL-15673).
[MGR RD 3.3.A]
- 1.2.6.21** The system shall comply with the applicable provisions of “Department of Defense Design Criteria Standard, Human Engineering” (MIL-STD-1472E).
[MGR RD 3.3.A]
- 1.2.6.22** The system shall comply with the applicable provisions of “1997 Uniform Building Code” (Volume 1, “Administrative, Fire- and Life-Safety, and Field Inspection Provisions”). Where conflicts exist between Uniform Building Code requirements and other design code requirements, the more stringent requirements shall apply.
[MGR RD 3.1.G, 3.3.A]
- 1.2.6.23** The system shall comply with the applicable provisions of “1997 Uniform Building Code” (Volume 2, “Structural Engineering Design Provisions”). Where

conflicts exist between Uniform Building Code requirements and other design code requirements, the more stringent requirements shall apply.

[MGR RD 3.1.G, 3.3.A]

1.2.6.24 The system shall comply with the applicable provisions of “1997 Uniform Building Code” (Volume 3, “Material, Testing and Installation Standards”). Where conflicts exist between Uniform Building Code requirements and other design code requirements, the more stringent requirements shall apply.

[MGR RD 3.1.G, 3.3.A]

1.2.6.25 The system shall comply with the applicable provisions of “General Fire Protection Guide for Fuel Reprocessing Plants” (Regulatory Guide 3.38).

[MGR RD 3.1.G]

1.3 SUBSYSTEM DESIGN CRITERIA

There are no subsystem design criteria for this system.

1.4 CONFORMANCE VERIFICATION

This section will be completed in a later revision.

2. DESIGN DESCRIPTION

Section 2 of this SDD summarizes information which is contained in other references. By assembling system specific information contained elsewhere (i.e., analyses, technical reports, etc.), Section 2 provides insight into the current state of the design of this system. However, due to the nature of design development, the information contained in this section will continue to change as the design matures.

Section 2 content is primarily based on information from Input Transmittal 00291.T, "Site Fire Protection Information to Support Site Recommendation."

2.1 SYSTEM DESIGN SUMMARY

The Site Fire Protection System provides the capability to detect, control, and extinguish fires, and/or mitigate explosions throughout the MGR with the exception of the WHB, WTB, CPB, and the SSF. This system provides fire protection and fire alarm monitoring capability for the balance of plant area facilities such as security station, administration building, medical center, etc. and for facilities located at the South Portal. Fire protection systems in the WHB, WTB, CPB, and SSF will provide fire protection for these areas and receive their fire protection water supply from the Site Fire Protection System.

The Site Fire Protection System includes explosion and fire detection alarm systems, appropriate suppression systems, and fire water supply system with sufficient capacity and capability to reduce the adverse effects of fires and explosions.

The fire water supply system provides appropriate flow and pressure for automatic fire suppression systems and hoses to suppress fires. This system includes fire water storage, required pumping systems, and distribution piping to satisfy this requirement.

The site wide fire detection, annunciation, and suppression systems consists of the equipment necessary to detect, annunciate, and suppress fires. The fire alarm systems in the various facilities and buildings will sound in the buildings and be transmitted to the site fire alarm annunciation and monitoring system by a radio system or over dedicated telecommunications copper-based loops. The central fire alarm annunciation and monitoring station in the fire station will monitor the fire alarm systems throughout the site. This system will monitor various sprinkler systems, deluge systems, fire pump systems, suction tank head and levels, special fire protection system, and the fire detection systems.

2.2 DESIGN ASSUMPTIONS

This section will be completed in a later revision.

2.3 DETAILED DESIGN DESCRIPTION

This section will be completed in a later revision.

2.4 COMPONENT DESCRIPTION

This section will be completed in a later revision.

2.5 CRITERIA COMPLIANCE

The surface facility is developed conceptually at this time without criteria compliance analyses. The criteria compliance for this system will be addressed in future issues of this SDD as the design and analysis of the system matures.

3. SYSTEM OPERATIONS

This section will be completed in a later revision.

4. SYSTEM MAINTENANCE

This section will be completed in a later revision.

APPENDIX A CRITERION BASIS STATEMENTS

This section presents the criterion basis statements for criteria in Section 1.2. Descriptions of the traces to "Monitored Geologic Repository Requirements Document" (MGR RD) and "Revised Interim Guidance Pending Issuance of New U.S. Nuclear Regulatory Commission (NRC) Regulations (Revision 01, July 22, 1999), for Yucca Mountain, Nevada" are shown as applicable. In anticipation of the interim guidance being promulgated as a Code of Federal Regulations, it will be referred to as "10 CFR 63" in this SDD.

1.2.1.1 Criterion Basis Statement

I. Criterion Need Basis

"Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section III, paragraph 4.5) requires an FHA to assess the risk from fire within the individual fire area. This criterion is needed to ensure that the system will provide protection for the site fire hazard types, hazard contents, and occupancy classes. "Fire protection" in this criterion means fire detection, suppression, and alarm features as needed to protect against the fire and explosion hazards. The FHA will be based on consideration of potential site fire ignition sources, combustibles, fire intensity, flame spreading, smoke generation, and production of toxic contaminants per the site FHA.

This criterion supports "MGR Compliance Program Guidance Package for the Site Fire Protection System" Guidance Statement 6.4g3.

This criterion supports MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.1.2 Criterion Basis Statement

I. Criterion Need Basis

The U.S. Department of Energy (DOE) imposes "Facility Safety" (DOE Order 420.1) on the MGR. The "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section IV, paragraph 9.7) requires automatic fire suppression in facilities where the maximum possible fire loss exceeds \$1 million or the ground floor area is in excess of 5,000 square feet.

This criterion meets MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

The \$1 million is based on the "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section IV, paragraph 9.7).

1.2.1.3 Criterion Basis Statement

I. Criterion Need Basis

The "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section IV, paragraph 9.7) requires redundant fire protection in areas where the maximum possible fire loss exceeds \$50 million. As acknowledged by the implementation guide, redundant fire protection can include items such as a fire barrier system, smoke detection in conjunction with a fully capable fire department, and other options. "Fire protection" in this criterion means fire detection, suppression, and alarm features as needed to protect against the fire and explosion hazards. Redundant options that include a programmatic solution, such as a fire department, are not considered a part of the system; however, programmatic solutions will be accounted for in the system design.

This criterion meets MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

The \$50 million is based on the "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section IV, paragraph 9.7).

1.2.1.4 Criterion Basis Statement

I. Criterion Need Basis

Although fire notification will be provided to fire response organizations, credit will not be taken for off-site fire response organizations to mitigate WHB fire events. The reason for this determination is the remoteness of the site (i.e., the time required for a response) and the potential nuclear safety impacts of a WHB fire that is beyond the incipient stage. This criterion is provided to ensure an adequate fire protection design without reliance on off-site fire response organizations.

II. Criterion Performance Parameter Basis

N/A

1.2.1.6 Criterion Basis Statement

I. Criterion Need Basis

This criterion establishes the operational life of the system. Additional system operating life that may be needed to support performance confirmation or retrieval operations conducted after cessation of waste emplacement operations, is not covered by this criterion. To meet the operational life requirement, system components may require replacement in addition to any required preventive maintenance program.

This criterion supports MGR RD 3.2.C.

II. Criterion Performance Parameter Basis

Table 3-2 of section 3.2.C of the MGR RD indicates that waste receipt will commence in the year 2010 and is expected to be completed by the year 2041, spanning a total of 32 years. To account for future potential schedule fluctuations caused by uncertainties in waste remediation, early receipt, and plant life extensions, a 25 percent margin is added, resulting in an operational life of 40 years.

1.2.1.7 Criterion Basis Statement

I. Criterion Need Basis

This criterion establishes the additional length of time the system may be asked to operate to allow future generations to continue monitoring the repository. This criterion supports MGR RD 3.2.H.

II. Criterion Performance Parameter Basis

The 300 years is provided in MGR RD 3.2.H.

1.2.1.8 Criterion Basis Statement

I. Criterion Need Basis

This system is responsible for penetration seal design. This criterion is needed to ensure that the fire barrier ratings are maintained for penetrations through fire barriers. The fire barrier ratings for fire barriers will be determined by the FHA. These ratings will be used for penetration seals.

This criterion meets MGR RD 3.3.A.

II. Criterion Performance Parameter Basis

N/A

1.2.2.2.1 Criterion Basis Statement

I. Criterion Need Basis

This criterion is provided to comply with "MGR Compliance Program Guidance Package for the Site Fire Protection System," Guidance Statements 6.1g2 and 6.3g13. This criterion is needed to facilitate an efficient and timely response to fire situations. This enables responding personnel to identify the location of a fire quickly and accurately and to indicate the status of emergency equipment or fire safety functions. Visual alarms in the local areas are judged to be necessary to for the hearing impaired.

This criterion meets MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.2.2.2 Criterion Basis Statement

I. Criterion Need Basis

This criterion is based on "General Fire Protection Guide For Fuel Reprocessing Plants," Regulatory Guide 3.38, section C.9.c. This criterion is provided to ensure manually actuated local alarms are included for personnel notification of fires. The criterion ensures local notification of fires in areas where automatic fire detectors are not installed while allowing for manual notification in areas where automatic detection does exist. This will help to provide a timely notification and response to an incipient fire. This criterion supports "MGR Compliance Program Guidance Package for the Site Fire Protection System," Guidance Statements 6.1g10 and 6.4g3.

This criterion supports MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.2.2.3 Criterion Basis Statement

I. Criterion Need Basis

This criterion supports "MGR Compliance Program Guidance Package for the Site Fire Protection System," Guidance Statement 6.1g10 by providing manual fire stations in accessible locations. This criterion is expanded to include all fire-fighting equipment needed for incipient fires. This criterion is provided to ensure fire-fighting equipment (e.g., portable fire extinguishers, fire hose stations, manual fire alarm stations, etc.) is

plainly marked, conspicuously located, and easily accessible to assist in a timely response to incipient fires.

This criterion meets MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.2.2.4 Criterion Basis Statement

I. Criterion Need Basis

A loss of primary power during MGR operation is credible. This criterion is needed so a loss of primary power does not cause a loss of fire alarm, fire signal transmission, fire detection, and suppression capabilities, and to support "MGR Compliance Program Guidance Package for the Site Fire Protection System," Guidance Statement 6.3g15.

This criterion meets MGR RD 3.3.A.

II. Criterion Performance Parameter Basis

N/A

1.2.2.2.5 Criterion Basis Statement

I. Criterion Need Basis

This criterion is based on "MGR Compliance Program Guidance Package for the Site Fire Protection System," Guidance Statements 6.1g1 and 6.3g1. This criterion ensures a single failure will not disable the entire fire suppression, detection, and alarm systems for the site.

This criterion supports MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.2.2.6 Criterion Basis Statement

I. Criterion Need Basis

The "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section III, paragraph 6.1) requires a reliable water supply for fire suppression. "Standard for the Installation of Private Fire Service Mains and Their

Appurtenances" (NFPA 24, Section 3-5) requires sectional controlling valves to permit sectionalizing the system in the event of a break, or for the making of repairs or extensions. This criterion is provided to ensure the fire main loop has supplemental reliability and availability. This will ensure that an impairment can be isolated without disabling the water supply to automatic and manual fire suppression systems to the multiple facilities that are supplied fire water by this system. This criterion supports "MGR Compliance Program Guidance Package for the Site Fire Protection System," Guidance Statement 6.3g2.

This criterion meets MGR RD 3.3.A.

II. Criterion Performance Parameter Basis

N/A

1.2.3.1 Criterion Basis Statement

I. Criterion Need Basis

This criterion is needed to support MGR RD 3.3.A, which requires compliance with applicable codes and standards. Wind is one of the primary external environmental parameters that can affect buildings and structures located outside. Proper consideration of wind is required to ensure that buildings and structures can withstand the wind forces, and that system components are adequately protected from the wind.

According to Section 6.5.2 of the standard for "Minimum Design Loads for Buildings and Other Structures" (ASCE 7-98), the basic wind speed is to be used in the determination of the design wind loads for all buildings and structures. A similar discussion is provided in Sections 1615, 1616, and 1618 of the "1997 Uniform Building Code" (Volume 2, "Structural Engineering Design Provisions").

II. Criterion Performance Parameter Basis

The maximum wind speed is obtained from "MGR Design Basis Extreme Wind/Tornado Analysis" (Section 7).

1.2.3.2 Criterion Basis Statement

I. Criterion Need Basis

Temperature is considered to be one of the primary environmental parameters that can affect component performance or result in advanced degradation. To ensure proper performance, many manufacturers specify the temperature environment in which the component must operate. This criterion establishes the outdoor temperature environment in which structures, systems, and components are expected to operate. This criterion supports MGR RD 3.3.A.

II. Criterion Performance Parameter Basis

The extreme outside temperature range of 5 degrees F to 117 degrees F is based on the annual extreme minimum and maximum temperatures for the nine meteorological monitoring sites located in the Yucca Mountain area. Locations of the nine sites are shown in Figure 2-1 of the "Engineering Design Climatology and Regional Meteorological Conditions Report." Extreme temperatures (and other data) are in Tables A-1 through A-9 of the report.

The collected temperature data in Tables A-1 through A-9 are based on 11 years of monitoring at Sites 1 through 5 and four years of monitoring at Sites 6 through 9. Site 1 data are typically more representative of the nine sites because Site 1 is closest to the repository. However, due to the limited number of years that data were collected, the lowest and highest recorded temperatures for all nine sites are used to bound the extreme temperature range. Site 5 has the lowest recorded temperature of -13.1 degrees C, and Site 9 has the highest of 45.1 degrees C. This temperature range was conservatively expanded to -15 degrees C (5 degrees F) to 47 degrees C (117 degrees F).

1.2.3.3 Criterion Basis Statement

I. Criterion Need Basis

Humidity is a primary environmental parameter that can affect component performance and anticipated life expectancy. This criterion establishes the external humidity environment at the site.

This criterion supports MGR RD 3.3.A.

II. Criterion Performance Parameter Basis

The humidity values are taken from the "Engineering Design Climatology and Regional Meteorological Conditions Report," Table A-1, Site 1 (NTS-60). Using Site 1 data is appropriate because the site is the closest and most representative of the North Portal, South Portal, and ventilation shafts. The annual mean humidity for Site 1 is 28 percent, which is the average of the yearly averages for each of the time periods (hour 0400, 1000, 1600, 2200) (from Table A-1). The minimum summer mean humidity for Site 1 is 13 percent, which occurred in the month of June at hour 1600 (from Table A-1). The maximum winter mean humidity for Site 1 is 46 percent (rounded up from 45.9), which occurred in the month of December at hour 0400 (from Table A-1).

1.2.4.1 Criterion Basis Statement

I. Criterion Need Basis

The ventilation system in surface facilities provides and controls airflow. The purpose of this interface is to ensure appropriate air control during a fire. This criterion is provided

to ensure these system (i.e., ventilation systems and Site Fire Protection System) designs are collaborated to optimize fire detection and smoke control. The types of interface controls are design solution dependent and will be developed as part of final design.

II. Criterion Performance Parameter Basis

N/A

1.2.4.2 Criterion Basis Statement

I. Criterion Need Basis

A loss of primary power is considered a credible event. This criterion is provided to ensure appropriate interface with the Site Electrical Power System for appropriate power supply. The types of interface controls are design solution dependent and will be developed as part of final design.

II. Criterion Performance Parameter Basis

N/A

1.2.4.3 Criterion Basis Statement

I. Criterion Need Basis

This system is the site-wide fire control system and provides fire alarm signals to the fire response organization and Central Control Center. This interface is required to provide automatic communications to the Central Control Center and fire response organization in a fire-related emergency in the WHB. The types of interface controls are design solution dependent and will be developed as part of final design.

II. Criterion Performance Parameter Basis

N/A

1.2.4.4 Criterion Basis Statement

I. Criterion Need Basis

This system is the site-wide fire control system and provides fire alarm signals to the Central Control Center and fire response organization. This interface is required to provide automatic communications to the Central Control Center and fire response organization in a fire-related emergency in the WTB. The types of interface controls are design solution dependent and will be developed as part of final design.

II. Criterion Performance Parameter Basis

N/A

1.2.4.5 Criterion Basis Statement

I. Criterion Need Basis

This system is the site-wide fire control system and provides fire alarm signals to the Central Control Center and fire response organization. This interface is required to provide automatic communications to the Central Control Fire and fire response organization in a fire-related emergency in the CPB. The types of interface controls are design solution dependent and will be developed as part of final design.

II. Criterion Performance Parameter Basis

N/A

1.2.4.6 Criterion Basis Statement

I. Criterion Need Basis

The Monitored Geologic Repository Operations Monitoring and Control System provides for the centralized monitoring and control of essential activities and safety related systems throughout the MGR. That system consists of the equipment and components necessary to provide human operators with sufficient information to monitor and control the operation of the surface repository in an efficient and safe manner. This system interfaces with the Monitored Geologic Repository Operations Monitoring and Control System to communicate site-wide fire protection equipment status to assist in site operations. This provides for a timely response to emergency conditions. The types of interface controls are design solution dependent and will be developed as part of final design. This criterion supports "MGR Compliance Program Guidance Package for the Site Fire Protection System," Guidance Statements 6.1g8 and 6.1.g11.

This criterion supports MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.4.7 Criterion Basis Statement

I. Criterion Need Basis

This system is the site-wide fire control system and provides fire alarm signals to the Central Control Center and fire response organization. This interface is required to

provide automatic communications to the Central Control Fire and fire response organization in a fire-related emergency in the SSF. The types of interface controls are design solution dependent and will be developed as part of final design.

II. Criterion Performance Parameter Basis

N/A

1.2.4.8 Criterion Basis Statement

I. Criterion Need Basis

This interface criterion is provided to ensure the fire water tanks are supplied water from the Site Water System.

II. Criterion Performance Parameter Basis

N/A

1.2.4.9 Criterion Basis Statement

I. Criterion Need Basis

The "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section III, paragraph 6.1) requires a reliable water supply of adequate capacity for fire suppression. The adequate capacity will be determined based on the results from FHA. This criterion is needed to ensure the amount and water quality (required flow rates, pressures, and duration) required for SSF fire protection is provided. The types of interface controls and specific quantities are design solution dependent and will be developed as part of final design. This criterion supports "MGR Compliance Program Guidance Package for the Site Fire Protection System," Guidance Statement 6.3g16.

This criterion meets MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.4.10 Criterion Basis Statement

I. Criterion Need Basis

The "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section III, paragraph 6.1) requires a reliable water supply of adequate capacity for fire suppression. The adequate capacity will be determined based on the results from fire hazards analysis. This criterion is needed to ensure the amount and

water quality (required flow rates, pressures, and duration) required for WTB fire protection is provided. The types of interface controls and specific quantities are design solution dependent and will be developed as part of final design. This criterion supports "MGR Compliance Program Guidance Package for the Site Fire Protection System," Guidance Statement 6.3g16.

This criterion meets MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.4.11 Criterion Basis Statement

I. Criterion Need Basis

The "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section III, paragraph 6.1) requires a reliable water supply of adequate capacity for fire suppression. The adequate capacity will be determined based on the results from FHA. This criterion is needed to ensure that the amount and water quality (required flow rates, pressures, and duration) required for CPB fire protection is provided. The types of interface controls and specific quantities are design solution dependent and will be developed as part of final design. This criterion supports "MGR Compliance Program Guidance Package for the Site Fire Protection System," Guidance Statement 6.3g16.

This criterion supports MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.4.12 Criterion Basis Statement

I. Criterion Need Basis

The "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section III, paragraph 6.1) requires a reliable water supply of adequate capacity for fire suppression. This criterion is needed to ensure that the amount and water quality (required flow rates, pressures, and duration) required for WHB fire protection is provided. The adequate capacity will be determined based on the results from FHA. The types of interface controls and specific quantities are design solution dependent and will be developed as part of final design. This criterion supports "MGR Compliance Program Guidance Package for the Site Fire Protection System," Guidance Statements 6.3g16 and 6.3g19. This criterion also meets MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.6.1 Criterion Basis Statement

I. Criterion Need Basis

This criterion identifies "Occupational Safety and Health Standards" (29 CFR 1910) as one of the applicable codes and standards necessary for this system design. This criterion supports MGR RD 3.1.E.

II. Criterion Performance Parameter Basis

N/A

1.2.6.2 Criterion Basis Statement

I. Criterion Need Basis

This criterion identifies "Safety and Health Regulations for Construction" (29 CFR 1926) as one of the applicable codes and standards necessary for this system design. This criterion supports MGR RD 3.1.F.

II. Criterion Performance Parameter Basis

N/A

1.2.6.3 Criterion Basis Statement

I. Criterion Need Basis

"Facility Safety" DOE Order 420.1 is applicable with the following specific exclusion [DOE Order 420.1, Section 3.c (1)]: "Activities that are regulated through a license by the Nuclear Regulatory Commission (NRC) or a state under an agreement with the NRC, including activities certified by the NRC under section 1701 of the "Atomic Energy Act"." The "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" facilitates the development of DOE fire protection programs to achieve the policy objectives and fulfill the requirements delineated in DOE Order 420.1. This criterion is provided to ensure this design complies with DOE Orders as applicable to the Site Fire Protection System design.

This criterion meets MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.6.4 Criterion Basis Statement

I. Criterion Need Basis

The "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section III, paragraph 3.0) states that an acceptable fire protection program should meet the minimum requirements established by the National Fire Protection Association (NFPA). "Standard for Portable Fire Extinguishers" (NFPA 10) is the national standard for portable fire extinguishers. This criterion is provided to ensure the applicable provisions of this code are addressed as applicable to the design of this system. This criterion supports "MGR Compliance Program Guidance Package for the Site Fire Protection System" Guidance Statements 6.3g20 and 7.1g1.

This criterion meets MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.6.5 Criterion Basis Statement

I. Criterion Need Basis

The "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section III, paragraph 3.0) states that an acceptable fire protection program should meet the minimum requirements established by the NFPA. "Standard for the Installation of Sprinkler Systems" (NFPA 13) is the national standard for fire sprinkler system design. This criterion is provided to ensure the applicable provisions of this code are addressed as applicable to the design of this system.

This criterion meets MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.6.6 Criterion Basis Statement

I. Criterion Need Basis

The "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section III, paragraph 3.0) states that an acceptable fire protection program

should meet the minimum requirements established by the NFPA. "Standard for Water Spray Fixed Systems for Fire Protection" (NFPA 15) is determined to be applicable to water spray systems. This criterion is provided to ensure the applicable provisions of this national standard are addressed as applicable to the design of this system.

This criterion meets MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.6.7 Criterion Basis Statement

I. Criterion Need Basis

The "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section III, paragraph 3.0) states that an acceptable fire protection program should meet the minimum requirements established by the NFPA. "Standard for the Installation of Stationary Pumps Fire Protection" (NFPA 20) deals with the selection and installation of pumps supplying water for fire protection. This criterion is provided to ensure the applicable provisions of this national standard are addressed as applicable to the design of this system. This criterion supports "MGR Compliance Program Guidance Package for the Site Fire Protection System," Guidance Statement 7.2g1.

This criterion meets MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.6.8 Criterion Basis Statement

I. Criterion Need Basis

The "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section III, paragraph 3.0) states that an acceptable fire protection program should meet the minimum requirements established by the NFPA. "Standard for Water Tanks for Private Fire Protection" (NFPA 22) provides the national standard for the design of tanks and accessory equipment. This criterion is provided to ensure the applicable provisions of this standard are addressed, as applicable, to the design of this system. This criterion supports "MGR Compliance Program Guidance Package for the Site Fire Protection System" Guidance Statement 7.3g1.

This criterion meets MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.6.9 Criterion Basis Statement

I. Criterion Need Basis

The "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section III, paragraph 3.0) states that an acceptable fire protection program should meet the minimum requirements established by the NFPA. "Standard for the Installation of Private Fire Service Mains and Their Appurtenances" (NFPA 24) is the national standard for installation of fire service mains. This criterion is provided to ensure the applicable provisions of this code are addressed as applicable to the design of this system. This criterion supports "MGR Compliance Program Guidance Package for the Site Fire Protection System" Guidance Statement 7.4g1.

This criterion meets MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.6.10 Criterion Basis Statement

I. Criterion Need Basis

The "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section III, paragraph 3.0) states that an acceptable fire protection program should meet the minimum requirements established by the NFPA. "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems" (NFPA 25) is determined to be applicable to the MGR since it applies standards for testing, inspection, and maintenance of water-based fire protection equipment. This criterion is provided to ensure the applicable provisions of this standard are addressed as applicable to the design of this system.

This criterion meets MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.6.11 Criterion Basis Statement

I. Criterion Need Basis

The "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section III, paragraph 3.0) states that an acceptable fire protection program should meet the minimum requirements established by NFPA. "Standard on Explosion Prevention Systems" (NFPA 69) and "Guide for Venting of Deflagrations" (NFPA 68) are determined to be applicable to explosion control and deflagration control. This criterion is provided to ensure the applicable provisions of this code are addressed as applicable to the design of this system. This criterion supports "MGR Compliance Program Guidance Package for the Site Fire Protection System" Guidance Statement 6.4g1.

This criterion meets MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.6.12 Criterion Basis Statement

I. Criterion Need Basis

The "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section III, paragraph 3.0) states that an acceptable fire protection program should meet the minimum requirements established by the NFPA. "National Fire Alarm Code" (NFPA 72) is the national code for fire alarm system design. This criterion is provided to ensure the applicable provisions of this code are addressed as applicable to the design of this system and to ensure the use of an NFPA 72-approved fire detection subsystem. This criterion supports "MGR Compliance Program Guidance Package for the Site Fire Protection System," Guidance Statements 6.1g7, 6.1g11, 6.3g10, 6.3g14, 6.3g11, and 7.7g1.

This criterion meets MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.6.13 Criterion Basis Statement

I. Criterion Need Basis

The "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section III, paragraph 3.0) states that an acceptable fire protection program

should meet the minimum requirements established by the NFPA. "Standard for the Installation of Air Conditioning and Ventilating Systems" (NFPA 90A) mainly applies to ventilation design. There are significant interfaces with the WHB ventilation design to control the spread of smoke and fire. This criterion is provided to ensure this system complies with the applicable requirements of NFPA 90A.

This criterion meets MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.6.14 Criterion Basis Statement

I. Criterion Need Basis

The "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section III, paragraph 3.0) states that an acceptable fire protection program should meet the minimum requirements established by the NFPA. This system is responsible for lightning protection for areas where a fire or explosion hazard exists. "Standard for the Installation of Lightning Protection Systems" (NFPA 780) is determined to be applicable because it addresses fire/explosion protection from lightning. This criterion is provided to ensure the applicable provisions of this code are addressed, as applicable, in the design of this system. This criterion supports "MGR Compliance Program Guidance Package for the Site Fire Protection System" Guidance Statements 6.3g4 and 7.8g1.

This criterion meets MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.6.15 Criterion Basis Statement

I. Criterion Need Basis

The "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section III, paragraph 3.0) states that an acceptable fire protection program should meet the minimum requirements established by the NFPA. "Standard for Fire Protection for Facilities Handling Radioactive Materials" (NFPA 801) is determined to be applicable to the MGR since it will be handling radioactive material. This criterion is provided to ensure the applicable provisions of this code are addressed as applicable to the design of this system. This criterion supports "MGR Compliance Program Guidance Package for the Site Fire Protection System," Guidance Statement 7.9g1. This criterion also meets MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.6.16 Criterion Basis Statement

I. Criterion Need Basis

The "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section III, paragraph 3.0) states that an acceptable fire protection program should meet the minimum requirements established by the NFPA. This system is responsible for fire hose couplings and adapters; therefore, "Standard for Fire Hose Connections" (NFPA 1963) is determined to be applicable. This criterion is provided to ensure the applicable provisions of this code are addressed as applicable to the design of this system.

This criterion meets MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.6.17 Criterion Basis Statement

I. Criterion Need Basis

The "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section III, paragraph 3.0), states that an acceptable fire protection program should meet the minimum requirements established by the NFPA. "Life Safety Code" (NFPA 101) deals with considerations that are essential to life safety, minimizing danger to life from fire (including smoke fumes) or panic, and other safety considerations. There are design features from NFPA 101 that impact the design of this system. Therefore, NFPA 101 is invoked as applicable to the design of this system.

This criterion supports MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.6.18 Criterion Basis Statement

I. Criterion Need Basis

The "Monitored Geologic Repository Project Description Document" allocates controlled project assumptions to systems. This criterion identifies the need to comply with the

applicable assumptions identified in the subject document. The approved assumptions will provide a consistent basis for continuing the system design.

II. Criterion Performance Parameter Basis

N/A

1.2.6.19 Criterion Basis Statement

I. Criterion Need Basis

The "Implementation Guide for use with DOE Orders 420.1 and 440.1 Fire Safety Program" (Section III, paragraph 3.0) states that an acceptable fire protection program should meet the minimum requirements established by the NFPA. This system is responsible for fire hose couplings and adapters; therefore, "Standard for the Installation of Standpipe and Hose Systems" (NFPA 14) is determined to be applicable as it is the national code for the design of standpipe and hose stations. This criterion is provided to ensure the applicable provisions of this standard are addressed as applicable to the design of this system.

This criterion meets MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.6.20 Criterion Basis Statement

I. Criterion Need Basis

Maintainability of system equipment involves many factors, including the human-machine interface. This interface must address the design for maintainability through the incorporation of human factors engineering criteria. In support of MGR RD 3.3.A, this criterion ensures that the system will be designed to be safely and effectively maintained through compliance with applicable industry standards. The DOE Good Practices Guide "Human Factors Engineering" (GPG-FM-027, paragraph 2.3.1) endorses the use of "Human Factors Design Guidelines for Maintainability of Department of Energy Nuclear Facilities" (UCRL-15673) for addressing human factors engineering maintainability design criteria.

This criterion meets MGR RD 3.3.A.

II. Criterion Performance Parameter Basis

N/A

1.2.6.21 Criterion Basis Statement

I. Criterion Need Basis

In support of MGR RD 3.3.A, this criterion ensures that the system will be designed to be safely and effectively used by all expected users. The DOE Good Practices Guide "Human Factors Engineering" (GPG-FM-027, paragraph 2.3.1) endorses the use of "Department of Defense Design Criteria Standard, Human Engineering" (MIL-STD-1472E) (GPG-FM-027 references an earlier version of MIL-STD-1472).

This criterion meets MGR RD 3.3.A.

II. Criterion Performance Parameter Basis

N/A

1.2.6.22 Criterion Basis Statement

I. Criterion Need Basis

MGR RD 3.3.A requires compliance with applicable industry codes and standards. This criterion identifies "1997 Uniform Building Code" (Volume 1, "Administrative, Fire- and Life-Safety, and Field Inspection Provisions") as applicable to the design of the system.

This criterion supports MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.6.23 Criterion Basis Statement

I. Criterion Need Basis

MGR RD 3.3.A requires compliance with applicable industry codes and standards. This criterion identifies "1997 Uniform Building Code" (Volume 2, "Structural Engineering Design Provisions") as applicable to the design of the system. This criterion supports "MGR Compliance Program Guidance Package for the Site Fire Protection System" Guidance Statement 6.3g3.

This criterion supports MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.6.24 Criterion Basis Statement

I. Criterion Need Basis

MGR RD 3.3.A requires compliance with applicable industry codes and standards. This criterion identifies "1997 Uniform Building Code" (Volume 3, "Material, Testing and Installation Standards") as applicable to the design of the system.

This criterion supports MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

1.2.6.25 Criterion Basis Statement

I. Criterion Need Basis

"General Fire Protection Guide for Fuel Reprocessing Plants" (Regulatory Guide 3.38) provides NRC guidance for fire protection design of fuel reprocessing plants. The MGR is similar in that there will be radioactive material managed within the facility with attendant risks due to potential fire and explosion. These events could result in the release of radioactive material. Therefore, Regulatory Guide 3.38 is applicable to the design of this system. This criterion supports "MGR Compliance Program Guidance Package for the Site Fire Protection System," Guidance Statements 6.1g1, 6.1g2, 6.1g3, 6.1g4, 6.1g5, 6.1g6, 6.1g7, 6.1g8, 6.1g9, 6.1g10, and 6.1g11.

This criterion meets MGR RD 3.1.G.

II. Criterion Performance Parameter Basis

N/A

APPENDIX B ARCHITECTURE AND CLASSIFICATION

The system architecture and QA classification are identified in Table 2. The QA classifications are established in Table 1 of “Classification of the MGR Site Fire Protection System.”

Table 2. System Architecture and QA Classification

	QL-1	QL-2	QL-3	CQ
Site Fire Protection System (SFP)		X		

APPENDIX C ACRONYMS, SYMBOLS, AND UNITS

C.1 ACRONYMS

CPB	Carrier Preparation Building
DOE	U.S. Department of Energy
F	Function
FHA	Fire Hazards Analysis
MGR RD	Monitored Geologic Repository Requirements Document
MGR	Monitored Geologic Repository
NFPA	National Fire Protection Association
NRC	U.S. Nuclear Regulatory Commission
QA	Quality Assurance
SSF	Subsurface Facility
TBD	To be determined
TBV	To be verified
WHB	Waste Handling Building
WTB	Waste Treatment Building

C.1 SYMBOLS AND UNITS

%	percent
m	meters

APPENDIX D FUTURE REVISION RECOMMENDATIONS AND ISSUES

This appendix identifies issues and actions that require further evaluation. The disposition of these issues and actions could alter the functions and design criteria that are allocated to this system in future revisions to this document. However, the issues and actions identified in this appendix do not require TBDs or TBVs beyond those already identified.

D.1 Issue 1—Fire Hazard Analysis

Perform an FHA to determine the fire hazards class, occupancy classes, and deflagration index for the balance of plant facilities.

APPENDIX E REFERENCES

This section provides a listing of references used in this SDD. References list the Accession number or Technical Information Catalog number at the end of the reference, where applicable.

"1997 Uniform Building Code." Volume 1, "Administrative, Fire- and Life-Safety, and Field Inspection Provisions." International Conference of Building Officials. April 1997. Whittier, California: International Conference of Building Officials. TIC: 233817.

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“Minimum Design Loads for Buildings and Other Structures.” American Society of Civil Engineers. ASCE 7-98. 2000. Reston, Virginia: American Society of Civil Engineers. TIC: 247427.

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