

Technical and Functional Requirements

Project No. 32045

Technical and Functional Requirements for Type II Interim Storage Enclosures (WMF-1624 – WMF-1629)

**Idaho
Cleanup
Project**

CH2M ♦ WG Idaho, LLC is the Idaho Cleanup Project
contractor for the U.S. Department of Energy

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 1 of 32
---	--

RWMC	Technical and Functional Requirements	For Additional Info: http://EDMS	Effective Date: 11/04/14
------	---------------------------------------	---	--------------------------

*The current revision can be verified on EDMS.

Change Number: 343216

CONTENTS

1.	INTRODUCTION	3
1.1	Ownership of the TFR	3
1.2	Specific Regulatory and Legal Commitments	3
1.2.1	Contractual Obligations.....	3
1.2.2	RCRA and Federal Facilities Agreement and Consent Order Commitments	3
1.3	Definitions/Glossary	4
1.4	Acronyms	5
2.	OVERVIEW	7
2.1	Facility, Structure, System, Component Functions	7
2.1.1	Site Infrastructure	7
2.1.2	Enclosure	7
2.1.3	Heating and Ventilation	7
2.2	Facility, Structure, System, and Component Safety Category.....	8
3.	REQUIREMENTS AND BASES	8
3.1	Functional and Performance Requirements	8
3.1.1	Facility or System.....	8
3.1.1.1	General	8
3.1.2	Systems, Subsystems, and Major Components	9
3.1.2.1	General	9
3.1.2.2	Foundation.....	11
3.1.2.3	Storage Enclosure.....	11
3.1.2.4	Emergency Egress Doors	12
3.1.2.5	Equipment and Personnel Protection Structures	12
3.1.2.6	Riser Room.....	13
3.1.2.7	Electrical Room.....	13
3.1.3	Boundaries and Interfaces	14
3.1.3.1	Project Internal and External Interface Requirements	14
3.1.4	Codes, Standards, and Regulations	14
3.1.4.1	National Codes and Regulations	14
3.1.4.2	Industry Standards.....	15

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 2 of 32
---	--

3.1.4.3	DOE and ICP Standards	15
3.1.5	Radiation and Other Hazards	16
3.1.6	ALARA	17
3.1.7	Fire Protection	17
3.1.7.1	General Fire Protection	17
3.1.8	Operating Environment and Natural Phenomena.....	18
3.1.9	Human Interface Requirements.....	19
3.1.9.1	Human Interfaces for Storage Enclosures.....	19
3.1.10	Environmental Management	19
3.2	Engineering Design Requirements	19
3.2.1	Architectural, Civil, and Structural	19
3.2.2	Mechanical	21
3.2.3	Electrical and Lighting.....	22
3.2.3.1	Electrical Power Supply and Distribution.....	22
3.2.3.2	Lighting.....	23
3.2.4	Instrumentation and Control.....	24
3.3	Testing and Maintenance Requirements.....	24
3.3.1	Testability.....	24
3.3.2	TSR-Required Surveillance.....	25
3.3.3	Maintenance	25
3.4	Other Requirements	25
3.4.1	Security and SNM Protection.....	25
3.4.2	Quality Assurance	25
4.	APPENDIXES	26
	Appendix A Source Documents.....	27

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 3 of 32
---	--

1. INTRODUCTION

This document contains technical and functional requirements (TFRs) associated with RWMC Type II Interim Storage Enclosures (WMF-1624 through WMF-1629). The RWMC Interim Storage Facility Storage Modules will be capable of providing lag or interim storage for retrieved or processed waste. The Type II Enclosures will be non-heated storage modules.

The facilities will meet all applicable EPA requirements, DOE Orders, and National Consensus Standards. Requirements for all structures, equipment, systems, and subsystems associated with the Type II Storage Enclosures are provided in Section 3 of this TFR. This project incorporates the experience and lessons learned from previous Type II storage enclosures and tension frame buildings constructed at RWMC.

The storage enclosures are to be constructed over the entire northern portion of former RWMC construction support area near the northern security fence line, where no waste has been identified, per the Record of Decision (ROD) for buried pits and trenches within the Radioactive Waste Management Complex (RWMC) [DOE/ID 2008]. This location shall be evaluated against future operational requirements for RWMC and alternate location determined if required by customer/management.

1.1 Ownership of the TFR

This document belongs to the RWMC Engineering Manager.

1.2 Specific Regulatory and Legal Commitments

This section identifies regulatory and legal commitments related to the project scope.

1.2.1 Contractual Obligations

The U.S. Department of Energy (DOE) Idaho Operations Office (DOE-ID) currently directs Idaho Cleanup Project (ICP) work to be performed through a contract with CH2M WG Idaho, LLC (CWI) [DOE-ID 2004]. List B (i.e., Appendix J) to the contract identifies DOE orders that are applicable to the contract and that are typically implemented through ICP programs and procedures.

1.2.2 RCRA and Federal Facilities Agreement and Consent Order Commitments

Responsibility to perform response actions under the Resource Conservation and Recovery Act (RCRA), [42 USC 85] section 6001, on DOE facilities was delegated to DOE.

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 4 of 32
---	--

1.3 Definitions/Glossary

Component is any item of equipment (e.g., pump, valve, or relay) or an element of a larger array (e.g., computer software, length of pipe, elbow, or reducer).

Environmental requirement is a requirement related to the environment and specifically, to environmental permitting or to the equivalent approval process that is appropriate for a CERCLA or RCRA project.

Mission-critical requirement is a requirement necessary to prevent or mitigate substantial interruptions of facility operations, severe cost, or other adverse impacts; or those necessary to satisfy DOE programmatic mission considerations.

Other requirement is a requirement that does not fit in the safety class, safety significant, other safety, environmental, or mission-critical classifications.

Other safety requirement is a requirement, not identified as safety class or safety significant, but necessary for a *structure* (see def.), system, and component (SSC) to perform functions considered important to overall facility safety and as part of worker safety or the defense-in-depth safety basis for the facility.

Safety class is a designation applied to SSCs (safety class SSCs) whose failure could adversely affect the environment or safety and health of the public, as identified by safety analyses.

Safety class requirement is a requirement identified as necessary for a safety class SSC to accomplish its safety function.

Safety significant is a designation applied to SSCs not designated as safety class SSCs, but whose preventive or mitigating function is a major contributor to defense in depth (e.g., prevention of uncontrolled material releases, and/or worker safety) as determined from hazard analysis.

Safety significant requirement is a requirement identified as necessary for a safety significant SSC to accomplish its safety function.

Shall denotes a mandatory provision or requirement.

Structure is an element that provides support or enclosure (e.g., a building, freestanding tank, basin, dike, or stack).

System is a collection of components assembled to perform a function (e.g., heating, ventilating, and air conditioning systems; control systems; utility systems; reactor cooling systems; or fuel storage systems).

**TECHNICAL AND FUNCTIONAL REQUIREMENTS
FOR TYPE II INTERIM STORAGE ENCLOSURES
(WMF-1624 – WMF-1629)**

Identifier: TFR-898

Revision*: 0

Page: 5 of 32

1.4 Acronyms

AHJ	Authority Having Jurisdiction
ALARA	As low As Reasonably Achievable
ARAR	Applicable or Relevant and Appropriate Requirement
ARP	Accelerated Retrieval Project
CAA	Clean Air Act
CAM	Continuous Air Monitor
CCTV	closed-circuit television
CERCLA	Comprehensive Environmental Response, Compensation and Liabilities Act
CFA	Central Facilities Area
CH	contact-handled
CWI	CH2M-WG Idaho, LLC
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy Idaho Operations Office
DOT	U.S. Department of Transportation
EDF	Engineering Design File
FAC	Fire Alarm Center
FACP	Fire Alarm Control Panel
FGE	Fissile Gram Equivalent
FHA	Fire Hazards Analysis
FM	Factory Mutual
GFCI	Ground Fault Circuit Interrupter
H&V	Heating and Ventilation
HAD	Hazards Analysis Document
ICP	Idaho Cleanup Project
INL	Idaho National Laboratory
MCP	Management Control Procedure

**TECHNICAL AND FUNCTIONAL REQUIREMENTS
FOR TYPE II INTERIM STORAGE ENCLOSURES
(WMF-1624 – WMF-1629)**

Identifier: TFR-898

Revision*: 0

Page: 6 of 32

NEC	National Electrical Code
NFPA	National Fire Protection Association
NRTL	Nationally Recognized Testing Laboratory
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PC	Personal Computer
PLC	Programmable Logic Controller
PPE	Personal Protective Equipment
PRD	Program Requirements Document
RCRA	Resource Conservation and Recovery Act
RFP	Rocky Flats Plant
ROD	Record of Decision
RWMC	Radioactive Waste Management Complex
SAR	Safety Analysis Report
SDA	Subsurface Disposal Area
SSC	Structure, System, or Component
TSCA	Toxic Substances Control Act
TFR	Technical and Functional Requirement
TRAMPAC	Transuranic Waste Authorized Methods for Payload Control
TRU	transuranic
TSR	technical safety requirement
UL	Underwriter's Laboratory
UPS	Uninterruptible Power Supply
VFD	Variable Frequency Drives
VOC	Volatile Organic Compound
WAC	Waste Acceptance Criteria
WIPP	Waste Isolation Pilot Plant

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 7 of 32
---	--

2. OVERVIEW

2.1 Facility, Structure, System, Component Functions

2.1.1 Site Infrastructure

Utilities will provide power, firewater, and fire alarms necessary for daily operation of the project equipment and structures. Fire alarms and electrical power will have to be extended or modified to the facilities' site. The existing site power distribution system will support the expected additional loads of the facilities, due to recent augmentation of the RWMC with a new substation. However, there will be a need for new transformers to support the facilities. Existing telecommunications fibers will be extended to new facilities, using existing resources at RWMC. Data/alarm telephone service to the facilities will require extensions from existing resources. Provisions for future telecommunications will be provided as practicable.

The existing fire water systems will be used to meet fire suppression requirements for the facilities. The existing 8-in. fire main currently runs relatively close to the southern boundary of the facilities and will need to be rerouted to prevent one of the Enclosures from being placed over the firewater line. The existing main will be tapped to provide risers for sprinkler system for each facility.

2.1.2 Enclosure

Storage and retrieval of drums are scheduled to occur on a year-round basis. The function of the enclosure is to protect these operations from inclement weather (e.g., wind, rain, snow, and/or freezing temperatures).

2.1.3 Heating and Ventilation

A filtered (dust only) inlet ventilation system will be used to support ventilation requirements within each facility. The heating and ventilation system will:

- Provide for adequate air changes to support drum handling activities in the storage area. (1 air change per hour)
- Provide freeze protection for sprinkler riser room and electrical equipment room.

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 8 of 32
---	--

2.2 Facility, Structure, System, and Component Safety Category

Where possible, the storage enclosures will be laid out such that all storage, waste handling and waste transport operations between the storage area and the treatment process area will take place in an enclosed area. The waste storage area will be tension frame fabric covered buildings and laid out such that additional modules may be added as storage demand increases. The architectural design of the building will be plain and simple with colors to match the existing RWMC color scheme. The storage enclosures will be designed with consideration for decontamination and decommissioning at the end of its useful life.

Documented Safety Analysis Advanced Mixed Waste Treatment Project [RPT-DSA-02 Rev 10] shall be revised to address facility modifications, deployed material handling vehicles, activities, and stored waste inventory. The quality level of components used for this project will be determined in accordance with management control procedure MCP-540, “Assigning Quality Levels.”

3. REQUIREMENTS AND BASES

In accordance with MCP-3572, “System Design Descriptions,” requirements defined in this section are classified using the following hierarchy:

- Safety class requirement (see def.) – denoted by “SC”
- Safety significant requirement (see def.) – denoted by “SS”
- Other safety requirement (see def.) – denoted by “OS”
- Environmental requirement (see def.) – denoted by “E”
- Mission-critical requirement (see def.) – denoted by “MC”
- Other requirement (see def.) – denoted by “O.”

3.1 Functional and Performance Requirements

3.1.1 Facility or System

3.1.1.1 General

Requirement: (O) The facilities shall use commercially-available (i.e., off-the-shelf) equipment/components to perform the system functions. When necessary to ensure complete or adequate performance of a system function, substitutions or modifications may occur, if pre-approved by Engineering.
[R-001]

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 9 of 32
---	--

Basis: Use of commercially-available components reduces the time required to design, develop, deploy, and maintain the operational system.

Requirement: (O) Facility design shall permit expeditious snow removal around its perimeter, using snow removal equipment, without damage to any attached or adjacent facilities/equipment, or any associated wiring and piping. **[R-002]**

Basis: Past history suggests the need for such a design. Once the area is covered in snow, significant resources are required to remove the snow, and there needs to be support for providing the safe access for equipment operation and monitoring.

3.1.2 Systems, Subsystems, and Major Components

3.1.2.1 General

Requirement: (MC) The storage enclosure and all attached structures shall protect the enclosed activities from weather conditions that could adversely impact operations. Weather conditions that could impact operations include, but are not limited to wind, precipitation (e.g., rain or snow), blowing and drifting snow, extreme temperatures, and fog. **[R-003]**

Basis: This requirement supports year-round operations and is intended to reduce operational delays caused by adverse weather conditions.

Requirement: (MC) Placement of the facility shall consider the 100-year flood plain and design shall incorporate necessary mitigation features as required for each facility. **[R-004]**

Basis: 40 CFR 264.

Requirement: (MC) The facility shall be designed to store 15,000 drum equivalent storage units in each facility. **[R-005]**

Basis: This requirement is directed by DOE-ID.

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 10 of 32
---	---

Requirement: (MC) The facility shall be designed to store drums in a dense pack (4 wide by 4 high) drum configuration as allowed by RCRA. [R-006]

Basis: This requirement is directed by DOE-ID.

Requirement: (MC) A drainage/collection system within the storage enclosures designed to meet RCRA and EPA requirements shall be provided. [R-007]

Basis: This requirement is directed by NFPA 801.

Requirement: (MC) Floors of the storage enclosures will be laid out in numbered grids to permit tracking of waste packages. [R-008]

Basis: This requirement is from past storage facility practices.

Requirement: (MC) A minimum 20 ft wide aisle will be provided down the center of each module to allow for stacking and unstacking of containers. [R-009]

Basis: 40 CFR 264.35.

Requirement: (MC) A minimum 3 ft wide aisle will be provided between each dense pack to allow egress to exits. [R-010]

Basis: 40 CFR 264.35 & NFPA 101 egress requirements.

Requirement: (MC) The facility shall be designed to protect personnel doorways and ventilation system components from adverse weather conditions that could impact safety or function of general maintenance activities associated with operation of the storage enclosure. [R-011]

Basis: The facility will shed snow that could overwhelm unprotected installations along the sloped (east and west) sides of the facility, without adequate snow canopies in place.

**TECHNICAL AND FUNCTIONAL REQUIREMENTS
FOR TYPE II INTERIM STORAGE ENCLOSURES
(WMF-1624 – WMF-1629)**

Identifier: TFR-898

Revision*: 0

Page: 11 of 32

Requirement: (MC) Safety and Operational support equipment/facilities apart from the structure will need to be evaluated as to whether or not separate weather enclosures are needed in support of remedial activities within facility. **[R-012]**

Basis: This requirement supports year-round operations and is intended to reduce operational delays caused by adverse weather conditions.

Requirement: (MC) Ventilation inlets shall be protected or designed to withstand damage from natural phenomena conditions (e.g., high winds, freezing rain, snow, hail). **[R-013]**

Basis: Lessons Learned.

3.1.2.2 Foundation

Requirement: (O) Foundation designs shall include provisions for passively maintaining the foundation elevations, in the event of subsidence. **[R-014]**

Basis: Lessons learned during RE 1 and RE 2 operations.

Requirement: (O) Any piping or conduit that is routed beneath a foundation shall be protected either by distance or appropriate shielding against future damage from the combined weight of the foundation and any loads supported by the foundation. **[R-015]**

Basis: Minimize damage to the subsurface piping caused by the weight of the foundation and foundation-supported loads.

3.1.2.3 Storage Enclosure

Requirement: (OS) The facility shall provide sufficient space (i.e., footprint and access) and electrical power for locating airborne monitoring instrumentation (e.g., continuous air monitors [CAMs] and portable/fixed air head samplers). **[R-016]**

Basis: PRD-183, Articles 555 and 753, “Airborne Radioactivity Monitoring.”

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 12 of 32
---	---

Requirement: (O) Overhead doors shall be installed center or north and south walls of the facility. The overhead door shall be electrically operated using 120 V, single phase power. The Overhead doors need to be sufficiently sized that traffic involving tractor/trailers can easily pass through their openings without extensive maneuvering. [R-017]

Basis: Overhead doors are needed in the facility to transfer drums into and out of facility. Preferred method is for drive through.

Requirement: (O) The fabric for facility must comply with National Fire Protection Association (NFPA) Code 701: *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films* [R-018]

Basis: HAD-501 and AHJ.

3.1.2.4 Emergency Egress Doors

Requirement: (OS) Emergency egress doors shall be placed as required per NFPA 101. [R-019]

Basis: NFPA 101, *Life Safety Code* establishes the egress requirements (minimum number of egress doors, spacing, egress paths, travel distance, etc.)

Requirement: (OS) Doors exiting the building will contain crash bars at the exit points and will all be keyed with a single unique key common to all egress doors. [R-020]

Basis: Best management practice

3.1.2.5 Equipment and Personnel Protection Structures

Requirement: (O) Shelters for protecting external equipment and personnel work areas shall meet requirements provided within the project fire hazard analysis. [R-021]

Basis: HAD-501.

Requirement: (O) Unless specifically identified otherwise in this TFR, shelters for protecting external equipment and personnel work areas shall include only roofs and associated structural supports. Walls, doors, windows, and floors are not required unless needed to prevent weather conditions

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 13 of 32
---	---

(e.g., drifting snow) that could damage or prevent critical control equipment from operating. [R-022]

Basis: Best management practice for efficient use of available funding.

NOTE: *Any portable generators/automatic transfer switches or load centers used on storage enclosures will not have shelters.*

Requirement: (O) Unless specifically identified otherwise in this document, any separate equipment shelters for protecting external equipment and personnel work areas are not required to have installed utilities, ventilation, or heating. [R-023]

Basis: Best management practice for efficient use of available funding. Lessons learned from previous RE operations.

3.1.2.6 Riser Room

Requirement: (OS) The fire sprinkler riser room shall be separated from the storage area. [R-024]

Basis: NFPA 801

Requirement: (OS) The fire sprinkler riser room shall be heated for freeze protection. [R-025]

Basis: NFPA 13

Requirement: (O) The fire sprinkler riser room shall drain to the outside of the facility. [R-026]

Basis: Best Engineering Practices

3.1.2.7 Electrical Room

Requirement: (OS) The electrical room shall be separated from the storage area. [R-027]

Basis: Best management practice

Requirement: (O) The electrical room shall be heated for freeze protection. [R-028]

Basis: NFPA 801

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 14 of 32
---	---

3.1.3 Boundaries and Interfaces

3.1.3.1 Project Internal and External Interface Requirements

Requirement: (MC) Site development shall include provisions for maintaining the electrical supply and distribution for existing operational facilities. [R-029]

Basis: Impacts to ongoing operational activities need to be minimized.

Requirement: (O) The storage Enclosures shall use, where available and practical, existing utilities at the RWMC. [R-030]

Basis: The intent of using existing utilities is to be cost effective by minimizing new construction.

Requirement: (O) Personnel walkways will be provided to accommodate personnel access to required systems routinely accessed during operations or maintenance. These walkways need to be leveled, cleared of obstructions, engineered to provide drainage away from the walkway surface, readily maintainable and for emergency egress. [R-031]

Basis: Past history, regarding the need for engineered (i.e., graveled) walkways around the facility (a personnel safety concern) and NFPA 101.

3.1.4 Codes, Standards, and Regulations

3.1.4.1 National Codes and Regulations

Requirement: (OS) “Occupational Safety and Health Act” [29 CFR 1910], “Worker Safety and Health Program” [10 CFR 851], and “Safety and Health Regulations for Construction” [29 CFR 1926] regulations, as appropriate and applicable, shall be considered in the design of facilities, facility modifications, and associated equipment. [R-032]

Basis: Legal requirement for adequate design of facilities, modification, and associated equipment.

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 15 of 32
---	---

3.1.4.2 Industry Standards

Requirement: (OS) All appropriate and applicable NFPA Codes and Standards shall be met for the design, installation and modification of the various components described in this TFR. [R-033]

Basis: STD-173, *ICP Architectural Standards*.

Requirement: (OS) All electrical equipment used in, on, or in support of Interim Storage Enclosures shall be approved by a Nationally Recognized Testing Laboratory (NRTL) (e.g., Underwriter Laboratories or CSA International-US), except where exceptions have been developed and approved (per MCP 1525). [R-034]

Basis: MCP-1525, “Providing Electrical Equipment Acceptable to the Authority Having Jurisdiction,” (2009), NFPA 70: *National Electrical Code*, (2014), 10 CFR 851: “Worker Safety and Health Program” (2009), and MCP-581: Fire Protection Authority Having Jurisdiction (AHJ) Records, Equivalencies, and Exemptions.

3.1.4.3 DOE and ICP Standards

Requirement: (O) STD-173, as appropriate and applicable, shall be used to support the design of the storage enclosure and associated equipment. [R-035]

Basis: Best management practice for adequate design of facilities, modifications, and associated equipment.

Requirement: (O) DOE Order 420.1B, “Facility Safety,” as appropriate and applicable, shall be used in the design of the storage enclosures and all attached structures, and associated equipment. [R-036]

Basis: DOE Order 420.1B states the requirements for adequate design of nuclear facilities, modifications, and associated equipment. Additionally, DOE Order 420.1B states the requirements for equivalencies and exemptions.

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 16 of 32
---	---

NOTE: *DOE Order 420.1B is an ICP contractual requirement. One requirement of the Order is compliance with national consensus industry standards and the model building codes applicable for the state or region. Special Requirements*

3.1.5 Radiation and Other Hazards

Requirement: (OS) The storage enclosures shall use features, equipment, and methods that help ensure individual worker radiation exposures are maintained within the limits defined in PRD-183, “Radiological Control Manual.” [R-037]

Basis: “Occupational Radiation Protection” [10 CFR 835]; 5 rem (5,000 mrem) is required by agency documents, while 0.7 rem (700 mrem) is the limit established in accordance with the PRD-183, “Radiological Control Manual,” Article 211.2.

Requirement: (OS) The storage enclosures shall be constructed of materials that are easily decontaminated and selected to minimize the buildup of radioactivity in the event of a drum breach. [R-038]

Basis: PRD-183, “Radiological Control Manual,” Article 381, “Radiological Design Criteria.” For materials used in facility construction and modification, the design objective shall be to select materials that facilitate operations, maintenance, decontamination, and decommissioning [see 10 CFR 835.1002 (d)]. Components will be selected to minimize the buildup of radioactivity.

Requirement: (E) An alpha CAMs shall be used to alarm on abnormal levels of airborne radioactivity. [R-039]

Basis: Ambient air monitoring for the project satisfies regulatory compliance. DOE Order 5400.5 CHG 2, *Radiation Protection of the Public and the Environment* [1993].

Requirement: (OS) The perimeter of the facility shall provide sufficient space (i.e., footprint and access) and electrical power for locating airborne monitoring instrumentation (e.g., stationary air monitors and portable/fixed air head samplers). [R-040]

Basis: PRD-183, “Radiological Control Manual,” Article 555 and 753, “Airborne Radioactivity Monitoring.”

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 17 of 32
---	---

3.1.6 ALARA

No additional requirements necessary.

3.1.7 Fire Protection

3.1.7.1 General Fire Protection

Requirement: (OS) The storage enclosure and all attached structures shall include features, subsystems, and components, as necessary, to provide for fire sprinkler protection of facility. **[R-041]**

Basis: The parent basis for this requirement is NFPA 801, *Standard for Fire Protection for Facilities Handling Radioactive Materials*.

Requirement: (OS) The fire sprinkler system for facility shall be a dry pipe system. **[R-042]**

Basis: The parent basis for this requirement is NFPA 801, *Standard for Fire Protection for Facilities Handling Radioactive Materials*, and Management decision to not provide heat for facility and NFPA 13.

Requirement: (OS) The storage facility frame and fabric shall meet requirements provided within the project FHA [HAD-501]. **[R-043]**

Basis: Project FHA [HAD-501], NFPA 801.

Requirement: (OS) The firewater supply for storage enclosures (plus all attached structures) shall provide adequate water supply duration and hose stream allowance requirements in accordance with NFPA 13 **[R-044]**

Basis: NFPA 13, NFPA 801 and DOE Order 420.1B.

Requirement: (OS) Portable fire extinguishers shall be provided for use in storage enclosures. **[R-045]**

Basis: This requirement supports implementation of the project FHA.

**TECHNICAL AND FUNCTIONAL REQUIREMENTS
FOR TYPE II INTERIM STORAGE ENCLOSURES
(WMF-1624 – WMF-1629)**

Identifier: TFR-898

Revision*: 0

Page: 18 of 32

Requirement: (O) The storage enclosures fire detection and fire alarm systems shall be compatible with existing communication protocols for interfacing with existing infrastructure, as well as being capable of remote annunciation to the Fire Alarm Center (FAC) by zone and device. Fire alarm, supervisory, and trouble signals shall be distinguishable by zone and device type or group of device. **[R-046]**

Basis: This requirement supports more efficient notifications and enables the fire department to better prepare for events prior to arriving on site.

Requirement: (OS) The fire detection and alarm system shall be approved by a nationally recognized testing laboratory (or equivalent) and shall be installed in accordance with the listing. **[R-047]**

Basis: NFPA 72 and NFPA 801.

Requirement: (OS) The storage enclosures fire detection and alarm system shall be installed such that it provides full coverage of all portions of the facility floor plan. **[R-048]**

Basis: NFPA 72 and NFPA 801.

3.1.8 Operating Environment and Natural Phenomena

Requirement: (O) Lightning protection shall be provided for the storage facility and all attached structures by bonding all metal structural components of the storage enclosure together and irreversibly connecting this bonded structure to the effectively grounded system. **[R-049]**

Basis: This requirement extrapolates a design decision documented in EDF-3151, "Lightning Protection Assessment for the Accelerated Retrieval Project for a Described Area in Pit 4." See also NFPA 780, Standard for the Installation of Lightning Protection Systems.

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 19 of 32
---	---

3.1.9 Human Interface Requirements

3.1.9.1 Human Interfaces for Storage Enclosures

Requirement: (OS) Non-combustible stairs or earthen ramps shall be provided at each working level transition in accordance with the project FHA. [R-050]

Basis: Project FHA.

Requirement: (OS) Illuminated or self-illuminating exit signs that are visible from a minimum of 100 feet shall be installed over all required emergency exits. [R-051]

Basis: NFPA 101, *Life Safety Code*, requires a rated viewing distance for exit signs of 30 m or 100 ft, viewable down an exit access corridor.

3.1.10 Environmental Management

Requirement: (E) The storage enclosures shall comply with the pertinent substantive requirements of the applicable or relevant and appropriate requirements (ARARs), e.g., the Resource Conservation and Recovery Act (RCRA), the Toxic Substance Control Act (TSCA), the Clean Air Act (CAA), and CERCLA, as identified in the OU 7-13/14 ROD. [R-052]

Basis: OU 7-13/14 ROD [DOE-ID 2008].

3.2 Engineering Design Requirements

This section identifies engineering design requirements, by discipline, which relate to the storage facility equipment and facility modifications.

3.2.1 Architectural, Civil, and Structural

Requirement: (O) The architectural, civil, and structural elements of the RE shall comply with applicable sections of STD-173, except as exempted. [R-053]

Basis: STD-173 is a company standard.

Requirement: (O) The seismic design category (SDC) shall be determined as required by DOE STD-1189 process. [R-054]

Basis: DOE STD-1189 and CWI STD-173-013133.

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 20 of 32
---	---

Requirement: (O) The storage facility shall be provided with sloped aprons in front of all doors to minimize potential precipitation infiltration into the building. [R-055]

Basis: Lessons learned from WMF-698.

Requirement: (E) The site development shall include provisions for directing snow melt and precipitation runoff away from storage facility into the storm-water ditch and culvert system. [R-056]

Basis: Snow melt and precipitation runoff requires management to protect groundwater from increased amounts of storm-water infiltration that could be caused by the installation of the storage enclosures.

Requirement: (E) The site development shall include provisions for maintaining adequate surface water drainage by the storm-water ditch and culvert system. [R-057]

Basis: The basis for this requirement is to address impacts to the storm-water ditch and culvert system. These impacts include:

- Modifications necessary because of the interference between the foundation system for the facilities and existing drainage ditches
- Improvements that may be needed to address increased amounts or redirection of runoff caused by installation of the facilities.

Requirement: (O) Any piping that is routed subsurface beneath heavy equipment or other vehicle traffic shall be protected either by distance or appropriate shielding against damage from the loads imposed by the heavy equipment or vehicular traffic. [R-058]

Basis: Minimize damage to the subsurface piping caused by the loads imposed by the heavy equipment or vehicular traffic.

Requirement: (OS) The storage enclosures egress doors shall be designed to allow personnel doors to be opened with a maximum force of 30 lb, thereby meeting the life safety code requirement for force on a door. [R-059]

Basis: NFPA 101. Needed to prevent personnel entrapment within the storage enclosures. Section 1008.1.2 of the *International Building Code* [International Code Council 2009].

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 21 of 32
---	---

3.2.2 Mechanical

Requirement: (O) The mechanical systems and materials shall comply with applicable sections of STD-173, except as exempted. **[R-060]**

Basis: STD-173 is a company standard.

Requirement: (OS) The exhaust fan/motor combination shall be a low maintenance unit. The fan/motor shall be a direct coupled unit with 100,000-hour sealed bearings in both the fan and motor. **[R-061]**

Basis: Lessons learned from the ARP and storage facility operation to reduce the maintenance required for long term operation/storage.

Requirement: (OS) The inlet air unit, supplying outside air to the storage facility shall include provisions for dust filters to minimize dust/dirt from entering through the inlets. **[R-062]**

Basis: Best management practice.

Requirement: (OS) The discharge from the fans shall be exhausted locally in a direction or manner to maximize dispersion and minimize potential localized exposure to personnel. A conventional stack design or an environmental monitoring system is not required. **[R-063]**

Basis: Standard exhaust practices for all ventilation units. Dispersive discharge is needed to provide sufficient dispersion of exhaust gases prior to potentially coming in contact with operational personnel at ground level. Required by Industrial Hygiene.

Requirement: (O) The inlet and exhaust units shall be designed to allow placement on a concrete slab or floor. Connection to the structure shall be with flexible duct or other suitable flexible connections to allow for differential movement between the exhaust units and the enclosure as required. **[R-064]**

Basis: Input from management and operations to provide portable equipment.

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 22 of 32
---	---

3.2.3 Electrical and Lighting

Requirement: (O) The electrical systems within the storage facility (plus attached structures) shall comply with applicable sections of STD-173, except as exempted. [R-065]

Basis: STD-173 is a company standard. It includes reference to NFPA 70, *National Electrical Code* (NEC) as the code of record for all electrical systems.

NOTE: *NFPA 70, National Electric Code 2014, is the code of record at the date of publication; however, the code of record at the time of construction shall be used.*

Requirement: (O) The grounding system for electrical power distribution shall minimize the need to bury grounding electrodes while meeting NFPA 70. [R-066]

Basis: The project site may have buried obstructions near the surface where grounding electrodes may be located.

Requirement: (O) Receptacles located inside or on the storage enclosure exterior, which would be considered wet or damp locations, shall be ground fault circuit interrupter (GFCI) protected, as well as protected from water spray, if mounted near grade level. [R-067]

Basis: This requirement is based on good engineering practice to provide additional electrical safety to operators.

3.2.3.1 Electrical Power Supply and Distribution

Requirement: (O) Since the existing power distribution does not have accessibility for facility power (i.e., transformers, etc.) distribution equipment shall be provided to supply electrical power to systems and equipment within storage enclosure. [R-068]

Basis: Limitations of the existing power distribution system.

Requirement: (O) The electrical power distribution system shall supply power at the following commonly used voltages:

- 480-V three-phase
- 208/120-V three-phase. [R-069]

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 23 of 32
---	---

Basis: Electrical power utilization equipment will need standard supply voltages. It is anticipated that electrical power will be delivered to the project at 12.5 kV from the substation on the north side of RWMC.

Requirement: (O) The facility power panels shall have, to the extent possible, spare breakers that will permit the addition or adjustment of loads. [R-070]

Basis: Systems engineering and operations needs the flexibility to add new loads or change loading on the feeders.

Requirement: (O) Receptacles (480 vAC) shall be installed to support battery powered forklift chargers. [R-071]

Basis: Battery powered equipment require chargers.

3.2.3.2 Lighting

Requirement: (OS) The facility shall include a lighting system that maintains the following illumination levels, where practical, to support operations:

- Overall—provide task lighting with localized area luminance of at least 5 fc
- The storage enclosure—provide an average design lighting level of 10-20 fc
- Emergency lighting—provide an average area luminance of 1 fc along designated paths of egress and at any point not less than 0.1 fc measured along the path of egress at floor level. [R-072]

Basis: Table D-3 of 29 CFR 1926.56 specifies a minimum illumination intensity requirement of 5 fc for construction material warehouses while work is in progress. Also, the IESNA Design Guide for Warehouse Lighting recommends that on an active warehouse where large items are handled requires 10 to 20 foot-candles. Based on this and past warehouse operations experience, a nominal design level of 15 fc is recommended. NFPA-101 stipulates emergency lighting along designated paths of egress.

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 24 of 32
---	---

Requirement: (O) All lighting luminaries shall be listed for their application (i.e., outside portable luminaries shall be listed as portable lighting products, if used) and used within their FM, CES, UL, or other NRTL listings. [R-073]

Basis: Satisfies a NEC reliability and safety requirement.

Requirement: (OS) The emergency lighting system inside the facility shall be designed to supply the emergency lighting for a minimum of 90 minutes. [R-074]

Basis: Emergency lighting is installed in accordance with the NFPA 101, in compliance with UL 924, *Emergency Lighting and Power Equipment*.

3.2.4 Instrumentation and Control

Requirement: (O) Cabling for transmission of control signals shall, to the extent practical, be located with adequate separation distance from electrical power supply and distribution cables to avoid unnecessary electromagnetic interference. [R-075]

Basis: Reflects good engineering practice.

Requirement: (OS) Instrumentation shall be available to measure the pressure differential between the interior of enclosure and the ambient atmosphere. [R-076]

Basis: Reflects good engineering practice for maintaining a stable ventilation flow.

Requirement: (OS) The exhaust fans and fan motors shall be operated by a VFD. [R-077]

Basis: Best management practice.

3.3 Testing and Maintenance Requirements

3.3.1 Testability

Requirement: (OS) The fire alarm and emergency exit lighting systems shall include features (e.g., attributes, components, or software) that facilitate testing for operability. [R-078]

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 25 of 32
---	---

Basis: NFPA codes, *Occupational Safety and Health Administration*, regulations (29 CFR 1910), and “Worker Safety and Health Program” (10 CFR 851) require periodic testing of the fire alarm and emergency exit lighting systems. The design must, therefore, include the testing features required by law and applicable codes to allow testing that ensures the systems are capable of proper operation when needed.

3.3.2 TSR-Required Surveillance

This section is not applicable to this specification.

3.3.3 Maintenance

Requirement: (O) The storage enclosures and all attached structures, and associated systems shall include features, as practical, to allow the performance of regular maintenance, inspection, and calibration as required for ensuring continued equipment reliability. [R-079]

Basis: The roles, responsibilities, accountabilities, and authorities document, *System Engineer* (R2A2-101) defines the responsibilities of system engineers assigned to maintain the system and subsystems. *ICP Integrated Work Control Process* (MCP-101) defines the requirements and process for the routine maintenance of equipment.

3.4 Other Requirements

This section identifies requirements not covered by other sections of the TFR.

3.4.1 Security and SNM Protection

Requirement: (O) The storage enclosures shall provide measures to preclude unauthorized access to the project buildings and areas. [R-080]

Basis: Compliance with *INL Access Controls* (LWP-11301) is the basis for this requirement.

3.4.2 Quality Assurance

Requirement: (O) Quality controls for the storage enclosures, and its components, shall be commensurate with the risk, function, and importance of the system and its components. [R-081]

Basis: “Nuclear Safety Management” (10 CFR 830), Subpart A, “Quality Assurance Requirements,” and *Quality Assurance Requirements for Nuclear Facility Applications* (ASME NQA-1).

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 26 of 32
---	---

Requirement: (O) The storage enclosures—as designed, procured, constructed, and documented—shall meet the quality controls as described in Companywide Manual 13, *Quality Assurance Program* [ICP2010]. [R-082]

Basis: The project is required to apply the company Quality Assurance Program to its activities. Controls will be applied commensurate with the risk, function, and importance of the system and its components as described in the company Quality Assurance Program including, for example, controls for design review, procurement, testing, and inspection. Other bases for this requirement are “Nuclear Safety Management” (10 CFR 830), Subpart A, “Quality Assurance Requirements”; *Quality Assurance* (DOE Order 414.1C); *Quality Assurance Requirements for Nuclear Facility Applications* (ASME NQA-1); EPA requirements for quality management plans; and EPA guidance for Quality Assurance project plans.

Requirement: (O) The storage enclosures shall be provided with a minimum of 2 exterior sample ports in each wall that does not have an overhead door to allow for RADCON to draw air samples. Ports should be in normal breathing zone above finish floor. [R-083]

Basis: Operational RADCON Experience.

Requirement: (O) The ventilation exhaust stack shall be provided with a sample ports allow for RADCON to draw air sample. Ports should be in normal breathing zone above finish floor. [R-084]

Basis: Operational RADCON Experience.

4. APPENDIXES

Appendix A, Source Documents

**TECHNICAL AND FUNCTIONAL REQUIREMENTS
FOR TYPE II INTERIM STORAGE ENCLOSURES
(WMF-1624 – WMF-1629)**Identifier: TFR-898
Revision*: 0
Page: 27 of 32**Appendix A****Source Documents**

- 10 CFR 830, “Nuclear Safety Management,” *Code of Federal Regulations*, Office of the Federal Register.
- 10 CFR 835, “Occupational Radiation Protection,” *Code of Federal Regulations*, Office of the Federal Register.
- 10 CFR 851, “Worker Safety and Health Program,” *Code of Federal Regulations*, Office of the Federal Register.
- 29 CFR 1910, “Occupational Safety and Health Standards,” *Code of Federal Regulations*, Office of the Federal Register.
- 29 CFR 1926, “Safety and Health Regulations for Construction,” *Code of Federal Regulations*, Office of the Federal Register.
- 40 CFR 61, “National Emission Standards for Hazardous Air Pollutants,” *Code of Federal Regulations*, Office of the Federal Register.
- 40 CFR 264, “Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities,” *Code of Federal Regulations*, Office of the Federal Register.
- 49 CFR 178, “Specifications for Packagings,” *Code of Federal Regulations*, Office of the Federal Register.
- 42 USC 9604, “Response Authorities,” *United States Code*.
- ANSI/ASME N511-2007, *In-Service Testing of Nuclear Air Treatment, Heating, Ventilating, and Air-Conditioning Systems*, American Society of Mechanical Engineers.
- ANSI/ASME NQA-1, 2012, *Quality Assurance Requirements for Nuclear Facility Applications*, American Society of Mechanical Engineers.
- ASME AG-1, 2012, *Code on Nuclear Air and Gas Treatment*, American Society of Mechanical Engineers.
- DOE Handbook 1169, 2003, *Nuclear Air Cleaning Handbook*, U.S. Department of Energy, Washington, DC 20585.
- DOE Manual 435.1-1, 2009, *Radioactive Waste Management Manual*, U.S. Department of Energy, Washington, DC 20585.
- DOE Order 414.1C, 2005, *Quality Assurance*, U.S. Department of Energy, Washington, DC 20585.

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 28 of 32
---	---

DOE Order 420.1B, 2005, *Facility Safety*, U.S. Department of Energy, Washington, DC 20585.

DOE Order 5400.5 Chg 2, 1993, *Radiation Protection of the Public and the Environment*.
U.S. Department of Energy, Washington, DC 20585.

DOE Standard 1066, 2012, *Fire Protection (Guidance)*, U.S. Department of Energy,
Washington, DC 20585.

DOE Standard 1088, 1995, *Fire Protection for Relocatable Structures*, U.S. Department of
Energy, Washington, DC 20585.

DOE Standard 1128, 2013, *Guide of Good Practices for Occupational Radiation Protection in
Plutonium Facilities*, U.S. Department of Energy, Washington, DC 20585.

DOE-Carlsbad, 2010, *Waste Acceptance Criteria for the Waste Isolation Pilot Plant*,
DOE/WIPP-02-3122, Rev. 7.0, U.S. Department of Energy-Carlsbad Field Office,
Carlsbad, NM.

DOE-ID, 2004, *Idaho Cleanup Project (ICP) Contract*, Contract No. DE-AC07-05ID14156,
U.S. Department of Energy Idaho Operations Office, Idaho Falls, ID 83415.

DOE-ID, 2006a, *Remedial Investigation and Baseline Risk Assessment for Operable
Unit 7-13/14*, DOE/ID-11241, U.S. Department of Energy, Idaho Operations Office,
Idaho Falls, Idaho 83415.

DOE-ID, 2006b, *DOE-ID Architectural Engineering Standards*, Rev. 33, Department of Energy
Idaho Operations Office, URL: http://icp-edms/pls/icp_docs/doc_63?f_manual=AES.

DOE-ID, 2008, *Record of Decision for the Radioactive Waste Management Complex Operable
Unit 7-13/14*, DOE/ID-11359, U.S. Department of Energy Idaho Operations Office;
U.S. Environmental Protection Agency, Region 10; Idaho Department of Environmental
Quality.

DOE-ID, 2010, *Phase 1 Remedial Design/Remedial Action Work Plan for Operable
Unit 7-13/14*, DOE/ID-11389, Rev. 1, U.S. Department of Energy, Idaho Operations
Office, Idaho Falls, Idaho 83415.

EDF-5131, 2004, "Lightning Protection Assessment for the Accelerated Retrieval Project for a
Described Area Within Pit 4," Idaho National Laboratory, Idaho Cleanup Project.

Ellis, Ralph D., Scott Amos, and Amish Kumar, 2003, *Illumination Guidelines for Nighttime
Highway Work*, Report 498, National Cooperative Highway Research Program,
Transportation Research Board, Washington, DC.

Executive Order 12580, January 23, 1987, *Superfund Implementation*, 52 FR 2923, 3 CFR,
Office of the Federal Register.

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 29 of 32
---	---

- GDE-436, 2012, “Engineering Guide for Temporary Power Use,” Rev. 1, Idaho National Laboratory, Idaho Cleanup Project.
- HAD-501, 2014, “Combination Fire Hazards Analysis and Fire Safety Assessment for Design and Construction of Interim Storage Buildings WMF-1624 through WMF-1629,” Rev. 0, Idaho National Laboratory, Idaho Cleanup Project.
- Idaho Cleanup Project, 2010, *Companywide Manual 13—Quality Assurance Program*, Idaho National Laboratory, Idaho Cleanup Project.
- Illumination Engineering Society, 2011, *The IESNA Lighting Handbook: Reference and Applications*, 10th Ed, Illumination Engineering Society of North America, New York, NY 10005-4001.
- INEL/INT-97-00695, 2004, *Criticality Safety Evaluation For Overloaded Drums At RWMC*, Rev. 2, Idaho National Engineering Laboratory, Idaho Falls, ID 83415.
- International Code Council, 2012, *2012 International Building Code*, International Code Council, Washington, DC 20001.
- JSA-1865, 2010, “Operation of Circuit Breakers, Disconnect Switches, and Motor Starters While Performing Maintenance and Operations Activities,” Rev. 2, Idaho National Laboratory, Idaho Cleanup Project.
- LWP-11301, 2013, *INL Access Controls*, Rev. 11, Idaho National Laboratory.
- MCP-91, 2013, “ALARA Program and Implementation,” Rev. 18, Idaho National Laboratory, Idaho Cleanup Project.
- MCP-101, 2014, “ICP Integrated Work Control Process,” Rev. 2, Idaho National Laboratory, Idaho Cleanup Project.
- MCP-153, 2010, “Industrial Hygiene Exposure Assessment,” Rev. 11, Idaho National Laboratory, Idaho Cleanup Project.
- MCP-540, 2014, “Assigning Quality Levels,” Rev. 24, Idaho National Laboratory, Idaho Cleanup Project.
- MCP-581, 2011, “Fire Protection Authority Having Jurisdiction (AHJ) Records, Equivalencies, and Exemptions,” Rev. 7, Idaho National Laboratory, Idaho Cleanup Project.
- MCP-1525, 2014, “Providing Electrical Equipment Acceptable to the Authority Having Jurisdiction,” Rev. 6, Idaho National Laboratory, Idaho Cleanup Project.
- MCP-2726, 2014, “Respiratory Protection,” Rev. 17, Idaho National Laboratory, Idaho Cleanup Project.

**TECHNICAL AND FUNCTIONAL REQUIREMENTS
FOR TYPE II INTERIM STORAGE ENCLOSURES
(WMF-1624 – WMF-1629)**

Identifier: TFR-898

Revision*: 0

Page: 30 of 32

MCP-3475, 2014, “Temporary Storage of CERCLA-Generated Waste at the INL Site,” Rev. 11, Idaho National Laboratory, Idaho Cleanup Project.

MCP-3572, 2012, “System Design Descriptions,” Rev. 8, Idaho National Laboratory, Idaho Cleanup Project.

MCP-3630, 2013, “I & C Computer System Management,” Rev. 12, Idaho National Laboratory, Idaho Cleanup Project.

NFPA 10, 2013, *Standard for Portable Fire Extinguishers*, National Fire Protection Association, Quincy, MA 02619.

NFPA 13, 2013, *Standard for the Installation of Sprinkler Systems*, National Fire Protection Association, Quincy, MA 02619.

NFPA 17, 2013, *Standard for Dry Chemical Extinguishing Systems*, National Fire Protection Association, Quincy, MA 02619.

NFPA 24, 2013, *Standard for the Installation of Private Fire Service Mains and Their Appurtenances*, National Fire Protection Association, Quincy, MA 02169.

NFPA 30, 2015, *Flammable and Combustible Liquids Code*, National Fire Protection Association, Quincy MA 02619.

NFPA 70, 2014, *National Electrical Code*, National Fire Protection Association, Quincy, MA 02619.

NFPA 72, 2013, *National Fire Alarm and Signaling Code*, National Fire Protection Association, Quincy, MA 02619.

NFPA 80, 2013, *Standard for Fire Doors and Other Opening Protectives*, National Fire Protection Association, Quincy, MA 02619.

NFPA 90A, 2015, *Standard for the Installation of Air-Conditioning and Ventilating Systems*, National Fire Protection Association, Quincy, MA 02619.

NFPA 101, 2014, *Life Safety Code*, National Fire Protection Association, Quincy, MA 02619.

NFPA 111, 2013, *Standard on Stored Energy Emergency and Standby Power Systems*, National Fire Protection Association, Quincy, MA 02619.

NFPA 220, 2015, *Standard on Types of Building Construction*, National Fire Protection Association, Quincy, MA 02619.

NFPA 701, 2010, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*, National Fire Protection Association, Quincy, MA 02619.

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 31 of 32
---	---

NFPA 780, 2014, *Standard for the Installation of Lightning Protection System*, National Fire Protection Association, Quincy, MA 02619.

NFPA 801, 2014, *Standard for Fire Protection for Facilities Handling Radioactive Materials*. National Fire Protection Association, Quincy, MA 02619.

NFPA 5000, 2015, *Building Construction and Safety Code*, National Fire Protection Association, Quincy, MA 02619.

NMED, 2009, *WIPP Hazardous Waste Facility Permit*, NM4890139088-TSDF, New Mexico Environmental Department, Albuquerque, NM.

PLN-2085, 2009, “Project Execution Plan for the ICP Radioactive Waste Management Complex Project,” Rev. 4, Idaho National Laboratory, Idaho Cleanup Project.

PRD-183, 2013, “Radiological Control Manual,” Rev. 21, Idaho National Laboratory, Idaho Cleanup Project.

PRD-5040, 2006, “Handling and Use of Compressed Gases,” Rev. 6, Idaho National Laboratory, Idaho Cleanup Project.

Provencher, R.B., April 14, 2008, “Letter to D.B. Rankin on DOE Approval for Use of a Video Detection System,” DOE-ID, Idaho Falls, ID 83415.

R2A2-101, 2004, *System Engineer*, Rev. 1, Idaho National Laboratory, Idaho Completion Project.

RPT-DSA-02, Rev. 10, “Documented Safety Report Advanced Mixed Waste Treatment Project.”

SAR-4, 2011, “Safety Analysis Report for the Radioactive Waste Management Complex,” Rev. 17, Idaho National Laboratory, Idaho Cleanup Project.

STD-173, 2014, “Architectural Engineering Standards,” Idaho National Laboratory, Idaho Cleanup Project.

TSR-4, 2011, “Technical Safety Requirements for the Radioactive Waste Management Complex,” Rev. 9, Idaho National Laboratory, Idaho Cleanup Project.

UL 924, 2006, *Emergency Lighting and Power Equipment*, Underwriters Laboratories, Camas, WA 98607-8542.

U.S. District Court, 2008, *Agreement to Implement, U.S. District Court Order Dated May 25, 2006, Public Service Co. of Colorado v. Batt*, No. CV-91-0035-S-EJL (D. Id.) and *United States v. Batt*, No. CV-91-0054-S-EJL (D. Id.), U.S. District Court, dated July 3, 2008.

TECHNICAL AND FUNCTIONAL REQUIREMENTS FOR TYPE II INTERIM STORAGE ENCLOSURES (WMF-1624 – WMF-1629)	Identifier: TFR-898 Revision*: 0 Page: 32 of 32
---	--

U.S. Nuclear Regulatory Commission, 2009, *Contact-Handled Transuranic Waste Authorized Methods for Payload Control (CH-TRAMPAC)*. Rev. 3, Washington, D.C., Office of Regulatory Procedures, U.S. Nuclear Regulatory Commission.
(http://www.wipp.energy.gov/Documents_Transportation.htm)