INTERIM STORAGE PARTNERS

January 27, 2021
E-58221

Director, Division of Fuel Management
Office of Nuclear Material Safety and Safeguards
U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

Reference: 1. Letter from Jeffery D. Isakson (ISP) to Director, Division of Fuel Management (NRC), "Supplemental information to Support NRC's Continued Review of the Safety Case for the WCS CISF, Docket 72-1050 CAC/EPID 001028/L-2017-NEW-0002," dated January 14, 2021

Subject: Supplemental information Part 2 to Support NRC's Continued Review of the Safety Case for the WCS CISF, Docket 72-1050 CAC/EPID 001028/L-2017-NEW-0002

Interim Storage Partners LLC (ISP) provides the following updated supplemental information regarding the NAC transfer casks related to protection against tornado missiles during transfer operations in the Cask Handling Building (CHB) between the transportation cask and the vertical concrete casks (VCCs) provided in Reference [1].

The following enclosures are being submitted with the above described clarifications:

- Enclosure 1 provides changes to the Proposed Technical Specifications.
- Enclosure 2 provides the associated SAR change pages (Public)

Should you have any questions regarding this submission, please contact Mr. Jack Boshoven of my staff by telephone at (410) 910-6955, or by email at jack.boshoven@orano.group.

Sincerely,

Jeffery D. Isakson
Chief Executive Officer/President
Interim Storage Partners LLC

cc: John-Chau Nguyen, Senior Project Manager, U.S. NRC
Jack Boshoven, ISP LLC
Elicia Sanchez, ISP LLC

Enclosures:

1. Updated Proposed Technical Specification (Public)
2. SAR Change Pages (Public)

Enclosure 1 to E-58221

Updated Proposed Technical Specification
(Public)

PROPOSED

MATERIALS LICENSE No. SNM-1050

APPENDIX A

WCS CONSOLIDATED INTERIM STORAGE FACILITY TECHNICAL SPECIFICATIONS

Docket 72-1050

Amendment 0

1.0 USE AND APPLICATION

1.1 Definitions

-- NOTE --

The defined terms of this section appear in capitalized type and are applicable throughout these Technical Specifications and Bases.

Term	Definition
ACTIONS	ACTIONS shall be that part of a Specification that prescribes Required Actions to be taken under designated Conditions within specified Completion Times.
CANISTER	CANISTERs are the sealed used nuclear fuel containers that consist of a fuel basket contained in a cylindrical shell, which is a welded pressure vessel that provides confinement of used fuel assemblies in an inert atmosphere or a cylindrical shell containing GTCC waste.
CANISTER TRANSFER SYSTEM (CTS)	The CTS is a structure designed for the transfer of a CANISTER from or to the TRANSPORTATION CASK to or from a VCC.
CASK HANDLING BUILDING (CHB) CRANES	The CASK HANDLING BUILDING (CHB) CRANES are minimum 130 ton overhead cranes used with special lifting devices as a single-failure-proof handling system to upright and transfer vertical TRANSPORTATION CASKS between the railcar and a laydown area permitting cask movement using the VCT. The CHB CRANES also support STC transfer and receipt inspection and shipment preparation for both TRANSPORTATION CASKS and STCs.
HORIZONTAL STORAGE MODULE (HSM)	An HSM (Standardized HSM, AHSM or other models enveloped by these designs) is a reinforced concrete structure for storage of a CANISTER at a used fuel storage installation (e.g., Standardized HSM includes the HSM Model 80 and Model 102 as described in the SAR.)
WCS CONSOLIDATED INTERIM STORAGE FACILITY (CISF)	The WCS CISF is a complex designed and constructed for the interim storage of canisterized used nuclear fuel and other canisterized radioactive materials associated with used fuel. The canisterized material is stored within HSMs or VCCs.

(continued)

1.1 Definitions (continued)

LOADING OPERATIONS (for NUHOMS® Systems)	LOADING OPERATIONS for NUHOMS® Systems include all licensed activities associated with the horizontal raising or lowering of the CANISTER and STC from the transport conveyance to the transfer vehicle. LOADING OPERATIONS begin when the Impact Limiters are removed from the STC and end when the STC is ready for TRANSFER OPERATIONS.
LOADING OPERATIONS (for Vertical Systems)	LOADING OPERATIONS for Vertical Systems include all licensed activities associated with lifting the TRANSPORTATION CASK from the transport conveyance and placing in/“under” the CTS. LOADING OPERATIONS begin when the Impact Limiters are removed from the TRANSPORTATION CASK and end when the TRANSPORTATION CASK is ready for TRANSFER OPERATIONS.
OPERABLE	An OPERABLE VCC heat removal system transfers sufficient heat away from the fuel assemblies such that the fuel cladding, CANISTER component and CONCRETE CASK temperatures do not exceed applicable limits.
SAFE CONDITION AND FORECAST	*A safe condition and forecast is considered to be the absence of: Tornado and Severe Thunderstorm Watches, Tornado and Severe Thunderstorm Warnings, and Hazardous Weather Outlook indicating a moderate or high risk of severe thunderstorms for the current date (Day 1).*
SHIPPING/TRANSFER CASK (STC)	A 10 CFR Part 71 licensed TRANSPORTATION CASK that is also licensed under 10 CFR Part 72 as a Transfer Cask will be used to transport the CANISTER to the WCS CISF and will be placed on a transfer vehicle for movement of a CANISTER to the HSM. (NUHOMS® Systems)
STORAGE OPERATIONS	STORAGE OPERATIONS include all licensed activities that are performed at the WCS CISF, while a CANISTER is located in an HSM or VCC on the storage pad within the WCS CISF perimeter. STORAGE OPERATIONS do not include CANISTER transfer between the STC and the HSM or transfer of the VCC between the CTS and storage pad.
TRANSFER CASK	TRANSFER CASK is a shielded device designed to hold the CANISTER during LOADING OPERATIONS, and UNLOADING OPERATIONS for the Vertical Systems.

(continued)

1.1 Definitions (continued)

TRANSFER OPERATIONS (NUHOMS® Systems)	TRANSFER OPERATIONS for NUHOMS® Systems include all licensed activities involving the movement of an STC loaded with a loaded CANISTER. TRANSFER OPERATIONS begin when the STC has been placed horizontal on the transfer vehicle ready for TRANSFER OPERATIONS and end when the CANISTER is located in an HSM on the storage pad within the WCS CISF perimeter. TRANSFER OPERATIONS include CANISTER transfer between the STC and the HSM.
TRANSFER OPERATIONS (Vertical Systems)	TRANSFER OPERATIONS for Vertical Systems include all licensed activities involved in using a TRANSFER CASK to move a loaded and sealed CANISTER.
TRANSPORT OPERATIONS (Vertical Systems)	TRANSPORT OPERATIONS for Vertical Systems include all licensed activities performed on a loaded VERTICAL CONCRETE CASK when it is being moved to and from its designated location on the storage pad. TRANSPORT OPERATIONS begin when the loaded VERTICAL CONCRETE CASK is placed on or lifted by a VCT and end when the CONCRETE CASK is set down in its storage position on the storage pad.
TRANSPORTATION CASK	A 10 CFR Part 71 licensed TRANSPORTATION CASK used to transport CANISTERS for the Vertical Systems.
UNLOADING OPERATIONS (NUHOMS® Systems)	UNLOADING OPERATIONS for NUHOMS® Systems include all licensed activities on a CANISTER to ready it for shipment off-site. UNLOADING OPERATIONS begin when the CANISTER and STC is removed from the transfer vehicle and end when the CANISTER and STC is loaded on the transport conveyance and is being prepared for transport.
UNLOADING OPERATIONS (Vertical Systems)	UNLOADING OPERATIONS for Vertical Systems include all licensed activities on a CANISTER to ready it for shipment off-site. UNLOADING OPERATIONS begin when the CANISTER is placed in the TRANSPORTATION CASK and end when the CANISTER and TRANSPORTATION CASK is loaded on the transport conveyance and is being prepared for transport.

(continued)

1.1 Definitions (continued)

VERTICAL CONCRETE CASK (VCC)	VERTICAL CONCRETE CASK is the cask that receives and holds a sealed CANISTER. It provides the gamma and neutron shielding and convective cooling of the spent fuel confined in the CANISTER.
VERTICAL CANISTER TRANSPORTER (VCT)	The VCT is used to move the TRANSPORTATION CASK within the cask handling building to or from the CTS. The VCT is also used to move the loaded VCC for TRANSPORT OPERATIONS.

1.0 USE AND APPLICATION

1.2 Logical Connectors

PURPOSE

The purpose of this section is to explain the meaning of logical connectors.

Logical connectors are used in Technical Specifications (TS) to discriminate between, and yet connect, Discrete Conditions, Required Actions, Completion Times, Surveillances, and Frequencies. The only logical connectors that appear in TS are AND and OR. The physical arrangement of these connectors constitutes logical conventions with specific meanings.

BACKGROUND

Several levels of logic may be used to state Required Actions. These levels are identified by the placement (or nesting) of the logical connectors and by the number assigned to each Required Action. The first level of logic is identified by the first digit of the number assigned to a Required Action and the placement of the logical connector in the first level of nesting (i.e., left justified with the number of the Required Action). The successive levels of logic are identified by additional digits of the Required Action number and by successive indentions of the logical connectors.

When logical connectors are used to state a Condition, Completion Time, Surveillance, or Frequency, only the first level of logic is used, and the logical connector is left justified with the statement of the Condition, Completion Time, Surveillance, or Frequency.

EXAMPLES

The following examples illustrate the use of logical connectors:

EXAMPLE 1.2-1

ACTIONS:

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO (Limiting Condition for Operation) not met.	A.1 Verify… AND A.2 Restore…	

In this example the logical connector AND is used to indicate that when in Condition A, both Required Actions A.1 and A.2 must be completed.

(continued)

1.2 Logical Connectors (continued)

EXAMPLES (continued)

EXAMPLE 1.2-2

ACTIONS:

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Stop… OR A.2 A.2.1 Verify… AND A.2.2 A.2.2.1 Reduce… OR A.2.2.2 Perform… OR A.3 Remove…	

This example represents a more complicated use of logical connectors. Required Actions A.1, A.2, and A.3 are alternative choices, only one of which must be performed as indicated by the use of the logical connector OR and the left justified placement. Any one of these three Actions may be chosen. If A.2 is chosen, then both A.2.1 and A.2.2 must be performed as indicated by the logical connector AND. Required Action A.2.2 is met by performing A.2.2.1 or A.2.2.2. The indented position of the logical connector OR indicates that A.2.2.1 and A.2.2.2 are alternative choices, only one of which must be performed.

1.0 USE AND APPLICATION

1.3 Completion Times

PURPOSE

The purpose of this section is to establish the Completion Time convention and to provide guidance for its use.

BACKGROUND

Limiting Conditions for Operation (LCOs) specify the lowest functional capability or performance levels of equipment required for safe operation of the facility. The ACTIONS associated with an LCO state Conditions that typically describe the ways in which the requirements of the LCO are not met. Specified with each stated Condition are Required Action(s) and Completion Times(s).

DESCRIPTION

The Completion Time is the amount of time allowed for completing a Required Action. It is referenced to the time of discovery of a situation (e.g., equipment or variable not within limits) that requires entering an ACTIONS Condition unless otherwise specified, providing the facility is in a specified condition stated in the Applicability of the LCO. Required Actions must be completed prior to the expiration of the specified Completion Time. An ACTIONS Condition remains in effect and the Required Actions apply until the Condition no longer exists or the facility is not within the LCO Applicability.

Once a Condition has been entered, subsequent subsystems, components, or variables expressed in the Condition, discovered to be not within limits, will not result in separate entry into the Condition unless specifically stated. The Required Actions of the Condition continue to apply to each additional failure, with Completion Times based on initial entry into the Condition.

EXAMPLES

The following examples illustrate the use of Completion Times with different types of Conditions and Changing Conditions.

EXAMPLE 1.3-1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met.	B.1 Perform Action B.1 AND B.2 Perform Action B.2	12 hours 36 hours

(continued)

1.3 Completion Times (continued)

EXAMPLES (continued)

Condition B has two Required Actions. Each Required Action has its own separate Completion Time. Each Completion Time is referenced to the time that Condition B is entered.

The Required Actions of Condition B are to complete action B.1 within 12 hours AND complete action B.2 within 36 hours. A total of 12 hours is allowed for completing action B.1 and a total of 36 hours (not 48 hours) is allowed for completing action B.2 from the time that Condition B was entered. If action B.1 is completed within 6 hours, the time allowed for completing action B.2 is the next 30 hours because the total time allowed for completing action B.2 is 36 hours.

EXAMPLES

EXAMPLE 1.3-2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One system not within limit.	A.1 Restore system to within limit.	7 days
B. Required Action and associated Completion Time not met.	B.1 Perform Action B.1. AND B.2 Perform Action B.2.	12 hours 36 hours

When a system is determined to not meet the LCO, Condition A is entered. If the system is not restored within 7 days, Condition B is also entered and the Completion Time clocks for Required Actions B.1 and B.2 start. If the system is restored after Condition B is entered, Condition A and B are exited, and therefore, the Required Actions of Condition B may be terminated.

(continued)

1.3 Completion Times (continued)

EXAMPLES (continued)

<u>EXAMPLE 1.3-3</u>

ACTIONS

---NOTE---

Separate Condition entry is allowed for each component.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Restore compliance with LCO.	4 hours
B. Required Action and associated Completion Time not met.	B.1 Perform Action B.1. <u>AND</u> B.2 Perform Action B.2.	6 hours 12 hours

The Note above the ACTIONS Table is a method of modifying how the Completion Time is tracked. If this method of modifying how the Completion Time is tracked was applicable only to a specific Condition, the Note would appear in that Condition rather than at the top of the ACTIONS Table.

The Note allows Condition A to be entered separately for each component, and Completion Times tracked on a per component basis. When a component is determined to not meet the LCO, Condition A is entered and its Completion Time starts. If subsequent components are determined to not meet the LCO, Condition A is entered for each component and separate Completion Times start and are tracked for each component.

IMMEDIATE COMPLETION TIME

When "Immediately" is used as a Completion Time, the Required Action should be pursued without delay and in a controlled manner.

1.0 USE AND APPLICATION

1.4 Frequency

PURPOSE	The purpose of this section is to define the proper use and application of Frequency requirements
DESCRIPTION	Each Surveillance Requirement (SR) has a specified Frequency in which the Surveillance must be met in order to meet the associated Limiting Condition for Operation (LCO). An understanding of the correct application of the specified Frequency is necessary for compliance with the SR. The "Specified Frequency" is referred to throughout this section and each of the Specifications of Section 3.0, Limiting Condition for Operation (LCO) and Surveillance Requirement (SR) Applicability. The "Specified Frequency" consists of the requirements of the Frequency column of each SR, as well as certain Notes in the Surveillance column that modify performance requirements. Situations where a Surveillance could be required (i.e., its Frequency could expire), but where it is not possible or not desired that it be performed until sometime after the associated LCO is within its Applicability, represent potential SR 3.0.4 conflicts. To avoid these conflicts, the SR (i.e., the Surveillance or the Frequency) is stated such that it is only "required" when it can be and should be performed. With a SR satisfied, SR 3.0.4 imposes no restriction.

(continued)

1.4 Frequency (continued)

EXAMPLES

The following examples illustrate the various ways that Frequencies are specified:

EXAMPLE 1.4-1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Verify pressure within limit.	12 hours

Example 1.4-1 contains the type of SR most often encountered in the Technical Specifications (TS). The Frequency specifies an interval (12 hours) during which the associated Surveillance must be performed at least one time. Performance of the Surveillance initiates the subsequent interval. Although the Frequency is stated as 12 hours, an extension of the time interval to 1.25 times the stated Frequency is allowed by SR 3.0.2 for operational flexibility. The measurement of this interval continues at all times, even when the SR is not required to be met per SR 3.0.1 (such as when the equipment is determined to not meet the LCO, a variable is outside specified limits, or the unit is outside the Applicability of the LCO). If the interval specified by SR 3.0.2 is exceeded while the facility is in a condition specified in the Applicability of the LCO, the LCO is not met in accordance with SR 3.0.1.

If the interval as specified by SR 3.0.2 is exceeded while the facility is not in a condition specified in the Applicability of the LCO for which performance of the SR is required, the Surveillance must be performed within the Frequency requirements of SR 3.0.2 prior to entry into the specified condition. Failure to do so would result in a violation of SR 3.0.4.

(continued)

1.4 Frequency (continued)

EXAMPLES (continued)

EXAMPLE 1.4-2

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
Verify flow is within limits.	Once within 12 hours prior to starting activity AND 24 hours thereafter

Example 1.4-2 has two Frequencies. The first is a one-time performance Frequency, and the second is of the type shown in Example 1.4-1. The logical connector "AND" indicates that both Frequency requirements must be met. Each time the example activity is to be performed, the Surveillance must be performed prior to starting the activity.

The use of "once" indicates a single performance will satisfy the specified Frequency (assuming no other Frequencies are connected by "AND"). This type of Frequency does not qualify for the 25% extension allowed by SR 3.0.2.

"Thereafter" indicates future performances must be established per SR 3.0.2, but only after a specified condition is first met (i.e., the "once" performance in this example). If the specified activity is canceled or not performed, the measurement of both intervals stops. New intervals start upon preparing to restart the specified activity.

2.0 FUNCTIONAL AND OPERATING LIMITS

2.1 Functional and Operating Limits

Subject to the limitation of the last sentence of Condition 9 of this license SNM-1050, the used nuclear fuel to be stored in an HSM or VCC at the WCS CISF shall meet the Approved Contents requirements of one of the following:

2.1.1 NRC Materials License SNM-2510, Amendment 4.

2.1.2 Table 1-1c or Table 1-1j (NUHOMS® 61BT DSC) of Certificate of Compliance 1004 Appendix A Technical Specifications For The Standardized NUHOMS® Horizontal Modular Storage System, including Amendments 3 through 13 inclusive.

2.1.3 Table 1-1t (NUHOMS® 61BTH DSC) of Certificate of Compliance 1004 Appendix A Technical Specifications For The Standardized NUHOMS® Horizontal Modular Storage System, including Amendments 10 through 13 inclusive.

2.1.4 Section 2.1 (NUHOMS® 24PT1) of Certificate of Compliance 1029 Appendix A Technical Specifications For The Standardized Advanced NUHOMS® System Operating Controls And Limits, including Amendments 0, 1, and 3.

2.1.5 Section B 2.1 (NAC-MPC System) of Certificate of Compliance 1025 Appendix B Technical Specification For The NAC-MPC System Approved Contents and Design Features, including Amendments 0 through 6.

2.1.6 Section B 2.1.2, “Maine Yankee SITE SPECIFIC FUEL Preferential Loading,” (NAC-UMS System) of Certificate of Compliance 1015 Appendix B Technical Specification For The NAC-UMS System Approved Contents and Design Features, including Amendments 0 through 5.

2.1.7 Table B.2-1, “PWR Fuel,” (MAGNASTOR System) of Certificate of Compliance 1031 Appendix B Technical Specification For The MAGNASTOR System Approved Contents, including Amendments 0 through 3, Revision 1, and Amendments 4 and 5.

2.0 FUNCTIONAL AND OPERATING LIMITS

2.2 Functional and Operating Limits Violations

If any Functional and Operating Limit of 2.1 is violated, the following actions shall be completed:

2.2.1 The affected CANISTER shall be placed in a safe condition.

2.2.2 Within 24 hours of discovering the event, notify the NRC Operations Center of the violation.

2.2.3 Within 60 days, submit a special report which describes the cause of the violation and the actions taken to restore compliance and prevent recurrence.

3.0 LIMITING CONDITION FOR OPERATION (LCO) AND SURVEILLANCE REQUIREMENT (SR) APPLICABILITY

LIMITING CONDITION FOR OPERATION

LCO 3.0.1	LCOs shall be met during specified conditions in the Applicability, except as provided in LCO 3.0.2.
LCO 3.0.2	Upon discovery of a failure to meet an LCO, the Required Actions of the associated Conditions shall be met, except as provided in LCO 3.0.5. If the LCO is met or is no longer applicable prior to expiration of the specified Completion Time(s), completion of the Required Action(s) is not required, unless otherwise stated.
LCO 3.0.3	Not applicable to a spent fuel storage cask.
LCO 3.0.4	When an LCO is not met, entry into a specified condition in the Applicability shall not be made except when the associated ACTIONS to be entered permit continued operation in the specified condition in the Applicability for an unlimited period of time. This Specification shall not prevent changes in specified conditions in the Applicability that are required to comply with ACTIONS. Exceptions to this Specification are stated in the individual Specifications. These exceptions allow entry into specified conditions in the Applicability when the associated ACTIONS to be entered allow operation in the specified condition in the Applicability only for a limited period of time.
LCO 3.0.5	Equipment removed from service or not in service in compliance with ACTIONS may be returned to service under administrative control solely to perform testing required to demonstrate it meets the LCO or that other equipment meets the LCO. This is an exception to LCO 3.0.2 for the system returned to service under administrative control to perform the testing required to demonstrate that the LCO is met.
LCO 3.0.6	Not applicable to a spent fuel storage cask.
LCO 3.0.7	Not applicable to a spent fuel storage cask.

(continued)

SURVEILLANCE REQUIREMENTS

SR 3.0.1	SRs shall be met during the specified conditions in the Applicability for individual LCOs, unless otherwise stated in the SR. Failure to meet a Surveillance, whether such failure is experienced during the performance of the Surveillance or between performances of the Surveillance, shall be failure to meet the LCO. Failure to perform a Surveillance within the specified Frequency shall be failure to meet the LCO except as provided in SR 3.0.3. Surveillances do not have to be performed on equipment or variables outside specified limits.
SR 3.0.2	The specified Frequency for each SR is met if the Surveillance is performed within 1.25 times the interval specified in the Frequency, as measured from the previous performance or as measured from the time a specified condition of the Frequency is met. For Frequencies specified as "once," the above interval extension does not apply. If a Completion Time requires periodic performance on a "once per . . ." basis, the above Frequency extension applies to each performance after the initial performance. Exceptions to this Specification are stated in the individual Specifications.
SR 3.0.3	If it is discovered that a Surveillance was not performed within its specified Frequency, then compliance with the requirement to declare the LCO not met may be delayed, from the time of discovery, up to 24 hours or up to the limit of the specified Frequency, whichever is less. This delay period is permitted to allow performance of the Surveillance. If the Surveillance is not performed within the delay period, the LCO must immediately be declared not met, and the applicable Condition(s) must be entered. When the Surveillance is performed within the delay period and the Surveillance is not met, the LCO must immediately be declared not met, and the applicable Condition(s) must be entered.
SR 3.0.4	Entry into a specified condition in the Applicability of an LCO shall not be made unless the LCO's Surveillances have been met within their specified Frequency. This provision shall not prevent entry into specified conditions in the Applicability that are required to comply with ACTIONS.

3.0 Limiting Condition For Operation (continued)

3.1 Radiation Protection

3.1.1 SHIPPING/TRANSFER CASK Exterior Surface Contamination

LCO 3.1.1 Removable surface contamination on the STC shall not exceed:

a. 2,200 dpm/100 cm^2 from beta and gamma sources; and

b. 220 dpm/100 cm^2 from alpha sources.

APPLICABILITY: During LOADING OPERATIONS (NUHOMS® Systems)

ACTIONS:

-- NOTE --

Separate condition entry is allowed for each STC.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. SHIPPING/TRANSFER CASK removable surface contamination limits not met.	A.1 Decontaminate the SHIPPING/TRANSFER CASK to bring the removable contamination to within limits	7 days <u>AND</u> Prior to TRANSFER OPERATIONS

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.1.1	Verify by either direct or indirect methods that the removable contamination on the exterior surfaces of the SHIPPING/TRANSFER CASK is within limits.	Once, prior to TRANSFER OPERATIONS.

3.2 NAC-MPC SYSTEM Integrity

3.2.1 CANISTER Maximum Time in the TRANSFER CASK

LCO 3.2.1 The CANISTER shall be transferred from the TRANSFER CASK to a VCC, or to a TRANSPORTATION CASK.

APPLICABILITY: During TRANSFER OPERATIONS and prior to TRANSPORT OPERATIONS (NAC MPC Systems)

ACTIONS:

--- NOTE ---
Separate condition entry is allowed for each NAC-MPC SYSTEM.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CANISTER transfer not completed.	A.1 Complete CANISTER TRANSFER OPERATIONS	25 days
B. Required Action and associated completion time not met	B.1 Return CANISTER to TRANSPORTATION CASK or VCC	5 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.2.1.1 Verify CANISTER transfer completed	Once within 25 days.

3.2 NAC-MPC SYSTEM Integrity

3.2.2 VCC Heat Removal System

LCO 3.2.2 The VCC Heat Removal System shall be OPERABLE. The VCC heat removal system is considered OPERABLE if the difference between the WCS CISF ambient temperature and the average outlet air temperature is ≤ 92°F for the YANKEE-MPC and for the MPC-LACBWR; or ≤ 110°F for the CY-MPC, or if all four air inlet and outlet screens are visually verified to be unobstructed. Failing this, a VCC heat removal system may be declared OPERABLE if an engineering evaluation determines the VCC has adequate heat transfer capabilities to assure continued spent nuclear fuel, CANISTER and VCC integrity.

APPLICABILITY: During STORAGE OPERATIONS (NAC MPC Systems)

ACTIONS:

-- NOTE --
Separate condition entry is allowed for each NAC-MPC SYSTEM.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met	A.1 Restore VCC Heat Removal System to OPERABLE status	8 hours
B. Required Action A.1 and associated completion time not met	B.1 Perform SR 3.2.2.1	Immediately and every 6 hours thereafter
	<u>AND</u>	
	B.2.1 Perform an engineering evaluation to determine that the VCC Heat Removal System is OPERABLE	12 hours
	<u>OR</u>	
	B.2.2 Place the NAC-MPC SYSTEM in a safe condition	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	Verify the difference between the average VCC air outlet temperature and WCS CISF ambient temperature is ≤92°F for the YANKEE-MPC CANISTER and the MPC-LACBWR CANISTER or ≤110°F for the CY-MPC CANISTER	24 hours
	OR	
	Visually verify all four air inlet and outlet screens are unobstructed	24 hours.

3.3 NAC-UMS® SYSTEM Integrity

3.3.1 CANISTER Maximum Time in the TRANSFER CASK

LCO 3.3.1 The CANISTER shall be transferred from the TRANSFER CASK to a VCC, or to a TRANSPORTATION CASK.

APPLICABILITY: During TRANSFER OPERATIONS and prior to TRANSPORT OPERATIONS (NAC UMS® Systems)

ACTIONS:

--- NOTE ---
Separate condition entry is allowed for each NAC-UMS® SYSTEM.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. 600 hour cumulative time limit not met	A.1 Load CANISTER into VCC	5 days
	<u>OR</u>	
	A.2 Load CANISTER into TRANSPORTATION CASK	5 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.1.1	Monitor elapsed time for compliance with LCO 3.3.1	As required to meet the time limit.

3.3 NAC-UMS® SYSTEM Integrity

3.3.2 VCC Heat Removal System

LCO 3.3.2 The VCC Heat Removal System shall be OPERABLE. The VCC heat removal system is considered OPERABLE if the difference between the ISFSI ambient temperature and the average outlet air temperature is ≤102°F for the PWR CANISTER, or if all four air inlet and outlet screens are visually verified to be unobstructed. Failing this, a VCC heat removal system may be declared OPERABLE if an engineering evaluation determines the VCC has adequate heat transfer capabilities to assure continued spent nuclear fuel and CANISTER integrity.

APPLICABILITY: During STORAGE OPERATIONS (NAC UMS® Systems)

ACTIONS:

-- NOTE --
Separate condition entry is allowed for each NAC-UMS® SYSTEM.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met	A.1 Ensure adequate heat removal to prevent exceeding short-term temperature limits	Immediately
	<u>AND</u>	
	A.2 Restore VCC Heat Removal System to OPERABLE status	25 days
B. Required Action A.1 or A.2 and associated completion time not met	B.1 Perform an engineering evaluation to determine that the VCC Heat Removal System is OPERABLE	5 days
	<u>OR</u>	
	B.2 Place the NAC-UMS SYSTEM in a safe condition	5 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.2.1	Verify the difference between the WCS CISF ambient temperature and the average outlet air outlet temperature is ≤102°F for the PWR CANISTER	24 hours
	OR	
	Visually verify all four air inlet and outlet screens are unobstructed	24 hours.
SR 3.3.2.2	Verify the difference between the WCS CISF ambient temperature and the average outlet air outlet temperature is ≤102°F for the PWR CANISTER	Once between 5 and 30 days after STORAGE OPERATIONS begin

3.4 MAGNASTOR SYSTEM Integrity

3.4.1 CANISTER Maximum Time in the TRANSFER CASK

LCO 3.4.1

The maximum time a CANISTER can remain in the MAGNASTOR TRANSFER CASK without the active cooling system running is shown below for the initial and subsequent transfer attempts. If the initial transfer attempt cannot be completed within the time limits shown in Table A, then subsequent transfer attempts shall comply with the time limits in Table B after the Required Actions in Condition A are met.

This time frame starts from the time a loaded MAGNATRAN TRANSPORTATION CASK is received and the MAGNATRAN TRANSPORTATION CASK is no longer in the horizontal orientation until the CANISTER is placed on the pedestal in a VCC. Likewise, this time frame also starts from the time a loaded CANISTER is lifted off the VCC pedestal until it is placed in the MAGNATRAN TRANSPORTATION CASK and the MAGNATRAN TRANSPORTATION CASK is placed in the horizontal orientation.

A. Initial Transfer Attempt Time Limits

Total PWR Heat Load (kW)	Maximum CANISTER Transfer Time (hours)
≤23	41

B. Subsequent Transfer Attempt Time Limits

Total PWR Heat Load (kW)	Maximum CANISTER Transfer Time (hours)
≤23	31

APPLICABILITY: During LOADING OPERATIONS, TRANSFER OPERATIONS or UNLOADING OPERATIONS (NAC MAGNASTOR® Systems)

3.4.1 CANISTER Maximum Time in the TRANSFER CASK

ACTIONS:

-- NOTE --
Separate condition entry is allowed for each MAGNASTOR® SYSTEM.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CANISTER transfer time limit not met.	A.1 Return the loaded CANISTER to the MAGNASTOR TRANSFER CASK	Immediately
	AND	
	A.2 Initiate the MAGNASTOR TRANSFER CASK active cooling system.	Immediately
	AND	
	A.3 Maintain the MAGNASTOR TRANSFER CASK active cooling system for a minimum of 24 hours	24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.1.1	Monitor elapsed time that a loaded CANISTER is not sitting on a VCC pedestal or in a MAGNATRAN TRANSPORTATION CASK that is not in the horizontal orientation and while the MAGNASTOR TRANSFER CASK active cooling system is not in operation.	Continuous during TRANSFER OPERATIONS and prior to TRANSPORT OPERATIONS.

3.4 MAGNASTOR SYSTEM Integrity

3.4.2 VCC Heat Removal System

LCO 3.4.2 The VCC Heat Removal System shall be OPERABLE.

APPLICABILITY: During STORAGE OPERATIONS (MAGNASTOR Systems)

ACTIONS:

-- NOTE --
Separate condition entry is allowed for each MAGNASTOR SYSTEM.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. VCC Heat Removal System inoperable	A.1 Ensure adequate heat removal to prevent exceeding short-term temperature limits	Immediately
	AND	
	A.2 Restore VCC Heat Removal System to OPERABLE status	30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.2.1	Verify the difference between the average VCC air outlet temperature and the WCS CISF ambient temperature indicates that the VCC Heat Removal System is operable in accordance with the MAGNASTOR thermal evaluation.	24 hours
	OR	
	Visually verify all VCC air inlet and outlet screens are free of blockage	24 hours.

4.0 DESIGN FEATURES

The specifications in this section include the design characteristics of special importance to each of the physical barriers and to the maintenance of safety margins in the WCS CISF design.

4.1 Site

The WCS CISF is located approximately 30 miles west of the City of Andrews, Texas, and five miles east of the City of Eunice, New Mexico. The WCS CISF is located approximately one-half mile east of the Texas-New Mexico boundary and approximately one mile north of Texas State Highway 176.

4.2 Storage System Features

4.2.1 Storage Systems

The WCS CISF is licensed to store spent fuel and GTCC waste in various NUHOMS® System HSMs. Each CANISTER shall be loaded at a 10 CFR Part 50 licensee's facility in accordance with one of the following 10 CFR Part 72 Materials License or Certificates of Compliance (CoC):

- SNM-2510, or
- CoC No. 1004, or
- CoC No. 1029

and shipped to the WCS CISF in a 10 CFR Part 71 certified shipping package (the STC). The CANISTER shall be transferred directly from the STC to the HSM at the Storage Pad.

In addition, the WCS CISF is licensed to store spent fuel and GTCC waste in various NAC VCCs, which include VCCs for the NAC-MPC, NAC-UMS, and MAGNASTOR. Each CANISTER shall be loaded at a 10 CFR Part 50 licensee's facility in accordance with one of the following 10 CFR Part 72 Certificates of Compliance (CoC):

- CoC No. 1025, or
- CoC No. 1015, or
- CoC No. 1031

and shipped to the WCS CISF in a 10 CFR Part 71 certified TRANSPORTATION CASK. The CANISTER shall be transferred from the TRANSPORTATION CASK to the VCC with the CTS and the VCC and CANISTER will be transferred from the CTS to the Storage Pad with the VCT.

4.2.2 Storage Capacity

The total storage capacity of the WCS CISF is limited to the material defined in Conditions 8A and 8B of the license. This total capacity of spent fuel assemblies is in the form of intact fuel assemblies, damaged fuel assemblies, failed fuel assemblies and fuel debris, as defined in SNM-2510; CoC No. 1004; CoC No. 1029, CoC No. 1025, CoC No. 1015, and CoC No. 1031.

(continued)

4.0 Design Features (continued)

4.3 Storage Area Design Features

The following storage location design features and parameters shall be implemented at the WCS CISF.

4.3.1 Storage Configuration

HSMs are placed together in single rows or back-to-back arrays. An end shield wall is placed on the outside end of any loaded outside HSM. A rear shield wall is placed on the rear of any single row loaded HSM.

The VCCs for NAC-MPC, NAC-UMS, and MAGNASTOR Systems shall meet the minimum center-to-center spacing requirements presented in the SAR.

4.3.2 Concrete Storage Pad Properties to Limit CANISTER Gravitational Loadings Due to Postulated Drops

The STCs with NUHOMS® CANISTERs have been evaluated for drops of up to 80 inches onto a reinforced concrete storage pad.

For concrete storage pads loaded with NAC-MPC, NAC-UMS, and/or MAGNASTOR VCC systems, the storage pad shall meet the concrete storage pad properties presented in CoC No. 1025, Section B 3.4, CoC No. 1015, Section B 3.4, and CoC No. 1031, Sections 4.3.1 and 5.4.

4.4 Cask Receipt and CTS

4.4.1 Lifting

Vertical lifting of the STC with a NUHOMS® CANISTER is not allowed. Horizontal lifting of the TRANSPORTATION CASK or TRANSFER CASK with an NAC-MPC, NAC-UMS or MAGNASTOR CANISTER is not allowed.

Lifting of a loaded TRANSPORTATION CASK, TRANSFER CASK, or VCC with an NAC-MPC, NAC-UMS or MAGNASTOR CANISTER shall be performed with the CHB CRANES, CTS, or VCT in accordance with the guidelines of NUREG-0612, “Control of Heavy Loads at Nuclear Power Plants,” July 1980. The lifting devices used with the CHB CRANES, CTS, and VCT shall be designed, fabricated, operated, tested, inspected, and maintained in accordance with the guidelines of NUREG-0612 with the following clarifications.

- The CTS shall be classified as a Type 1 crane in accordance with ASME NOG-1, 2015. Load Combinations and allowable stresses used in the CTS structural design shall be in accordance with ASME NOG-1. The CTS shall be designed, fabricated, operated, tested, inspected, and maintained in accordance with the guidelines of NUREG-0612. The specific applicable standard being applied to each primary gantry system component is as follows:

  - Hydraulic Locking Telescoping Boom Gantry Leg Assemblies on Self Propelled Dollies – ASME B30.1
  - Lift Beams (spanning the Telescoping Gantry Leg Assemblies) – ASME NOG-1 for design, fabrication, and initial testing; ANSI N14.6 for testing, inspection, and maintenance

- Trolley Beam (spanning the Lift Beams & also mounted on Self Propelled Dollies) - ASME NOG-1 for design, fabrication, and initial testing; ANSI N14.6 for testing, inspection, and maintenance
- Standard Lift Links - ASME B30.26
- Standard Shackles - ASME B30.26
- Standard Slings - ASME B30.9
- Transfer Cask Lift Plates - ANSI N14.6
- Air Operated Chain Hoist (suspended from Trolley Beam) – ASME NUM-1, Type 1-B for design, fabrication, and initial testing; ASME B30.16 for testing, inspection, and maintenance
- Canister Lift Adapter (which mates with canister) – ANSI N14.6

- The VCT with TRANSPORTATION CASK lifting devices shall be designed, fabricated, operated, tested, inspected and maintained in accordance with the guidance of NUREG-0612, Section 5.1. The specific applicable standard being applied to each primary VCT is as follows:

  - Hydraulic Locking Telescoping Boom Assemblies – ASME B30.1
  - Lift Beam(s) (spanning the Telescoping Boom Assemblies) ANSI N14.6
  - Cask Lift Links - ANSI N14.6

- The CHB CRANES with TRANSPORTATION CASK lifting devices shall be designed, fabricated, operated, tested, inspected and maintained in accordance with the guidance of NUREG-0612, Section 5.1. The specific applicable standard being applied to each crane is as follows:

  - Crane structure and main hoist system: ASME NOG-1, 2015 Type I for design, fabrication and initial testing; ASME B30.2 for operation, testing, inspection, and maintenance
  - Cask Lifting Devices - ANSI N14.6

4.4.2 Post-transportation Verification

The design and licensing basis analysis provides reasonable assurance of the confinement effectiveness of the canisters allowed for storage at the WCS CISF. The confinement boundary of each canister type authorized for storage at the WCS CISF is evaluated to demonstrate that the loads during normal conditions of transport (NCT) do not exceed ASME B&PV Subsection NB Article NB-3200 (level A allowable). In addition, a Post-Transportation Verification shall include (1) visual inspection on a minimum of two bounding canisters from each site of origin, and (2) helium leak test on all canisters shipped to the WCS CISF.

- Criteria used to screen and select the two bounding canisters from each reactor site are based on the canister susceptibility assessment criteria developed in the Electric Power Research Institute (EPRI) report, Susceptibility Assessment Criteria for Chloride-Induced Stress Corrosion Cracking (CISCC) of Welded Stainless Steel Canisters for Dry Cask Storage Systems (Report No. 3002005371).

4.0 Design Features (continued)

- Personnel performing visual examinations shall be qualified and certified in accordance with the American Society of Mechanical Engineers (ASME) Code Section XI, IWA 2300, Visual Examination, Personnel Qualification and the Responsible Individual, including the requirements of ASME XI, Appendix VI, Rounded Indications, latest edition.

- Post transportation leakage testing shall comply with ANSI N 14.5 – 1997, “American National Standard for Radioactive Materials – Leakage Tests on Package for Shipment.”

- Post transportation leakage testing shall be conducted in accordance with approved procedures by a Nondestructive Testing (NDT) Level III specialist or examiner.

- Personnel performing post transport leak testing shall be certified as LT Level II, or LT Level III in accordance with the American Society for Nondestructive Testing (ASNT) Practice No. SNT-TC-1A, Personnel Qualification and Certification in Nondestructive Testing, up to the 2006 edition as permitted by the 2013 Code Edition.

4.5 Design Basis Site Specific Parameters and Analyses

The potential for fire and explosion shall be addressed by limiting the amount of flammable liquids during LOADING OPERATIONS below the fire load limits for the respective systems in the SAR. This includes the condition that the fuel tank of the cask handling equipment used to move the loaded VCC onto or from the Storage Pads contains no more than 50 gallons of fuel and no more than 300 gallons for the NUHOMS® Systems.

5.0 ADMINISTRATIVE CONTROLS

5.1 Programs

Interim Storage Partners shall implement the following programs to ensure the safe operation and maintenance of the WCS CISF:

- Radiological Environmental Monitoring Program (see 5.1.1 below)
- Radiation Protection Program (see 5.1.2 below)
- HSM Thermal Monitoring Program (see 5.1.3 below)

5.1.1 Radiological Environmental Monitoring Program

a. A radiological environmental monitoring program will be implemented to ensure that the annual dose equivalent to an individual located outside the WCS CISF controlled area does not exceed the annual dose limits specified in 10 CFR 72.104(a).

b. Operation of the WCS CISF will not create any radioactive materials or result in any credible liquid or gaseous effluent release.

5.1.2 Radiation Protection Program

a. The Radiation Protection Program will establish administrative controls to limit personnel exposure to As Low As Reasonably Achievable (ALARA) levels in accordance with 10 CFR Part 20 and Part 72.

b. Dosimetry will be used to monitor direct radiation around the WCS CISF.

c. In accordance with 10 CFR 72.44(d), a periodic report will be submitted specifying the quantity of each of the principal radionuclides released to the environment in liquid and gaseous effluents during the previous calendar year of operation.

(continued)

5.0 Administrative Controls (continued)

5.1.3 HSM Thermal Monitoring Program

This program provides guidance for temperature measurements that are used to monitor the thermal performance of each HSM. The intent of the program is to prevent conditions that could lead to exceeding the concrete and fuel clad temperature criteria. Each user must implement TS 5.1.3(a).

a. Daily Visual Inspection of HSM Inlets and Outlets (Front Wall and Roof Birdscreens)

The user shall develop and implement procedures to perform visual inspection of HSM inlets and outlets on a daily basis. There is a possibility that the HSM air inlet and outlet openings could become blocked by debris, as postulated and analyzed in the SAR accident analyses for air vent blockage. The procedures shall ensure that blockage will not exist for periods longer than assumed in the SAR analyses.

Perform a daily visual inspection of the air vents to ensure that HSM air vents are not blocked for more than 40 hours. If visual inspection indicates blockage, clear air vents and replace or repair birdscreens if damaged. If the air vents are blocked or could have been blocked for more than 40 hours, evaluate existing conditions in accordance with the site corrective action program to confirm that conditions adversely affecting the concrete or fuel cladding do not exist.

5.1.4 Corrective Action Program

If a non-conforming canister is found during the receipt inspection, the canister shall be placed in a safe condition and a corrective action will be initiated in accordance with the licensee's approved quality assurance program.

The corrective action shall address the regulatory requirements for reporting to the appropriate agency, including the deadlines for such notification and the appropriate licensing actions initiated to resolve the situation. The corrective actions shall include, but are not limited to the following:

- Notify the NRC as required, conferring with the NRC as needed.
- Maintain the canister inside the transportation cask in its transportation configuration until appropriate corrective actions are determined. The safety for temporary storage will be confirmed using Part 71 analysis as appropriate.
- Develop an action plan with a time frame which will include input from the NRC discussion.
- Obtain NRC's approvals as necessary.
- Proceed with corrective actions.

The timeline by which a canister will be returned to the place of origin, or other facility licensed for canister operations, will depend on the specific corrective actions required to address the condition identified by the corrective action evaluation performed.

(continued)

5.0 Administrative Controls (continued)

5.2 Lifting Controls

5.2.1 Lifting Height and Temperature Limits

The requirements of TS 4.4 apply to the CHB CRANES, VCT, and CTS and associated lifting devices. Confirm the surface temperature of the STC or TRANSPORTATION CASK is above 0 °F before beginning LOADING OPERATIONS and UNLOADING OPERATIONS

The lifting height of a STC, TRANSPORTATION CASK with CANISTER, or TRANSFER CASK with CANISTER is limited as a function of low temperature and the type of lifting/handling device, as follows:

- No lifts or handling of the STC or TRANSFER CASK with CANISTER at any height are permissible at STC or TRANSFER CASK surface temperatures below 0 °F.
- The maximum lift height of the STC with CANISTER shall be 80 inches if the surface temperature of the SHIPPING/TRANSFER CASK is above 0 °F and a non-single failure proof lifting/handling device is used.
- For vertical cask systems, LOADING OPERATIONS, TRANSFER OPERATIONS, and UNLOADING OPERATIONS shall be conducted using a single failure proof lifting/handling system.
- No lift height restriction is imposed on the STC, TRANSPORTATION CASK with CANISTER, or TRANSFER CASK with CANISTER if the STC or TRANSFER CASK or TRANSPORTATION CASK surface temperature is higher than 0 °F and a single failure proof lifting/handling system is used.

The requirements of 10 CFR Part 72 apply when the STC with CANISTER is in a horizontal orientation on the transfer vehicle.

The VCC loaded with an NAC-MPC, NAC-UMS, or MAGNASTOR CANISTER is not permitted to be lifted greater than 6 inches, 24 inches, and 24 inches in the vertical direction, respectively, and shall be transported by the VCT.

5.2.2 Cask Drop

Inspection Requirement

The NUHOMS® CANISTER will be inspected for damage after any STC with CANISTER side drop of 15 inches or greater.

Safety Analysis

The analysis of bounding drop scenarios shows that the STC will maintain the structural integrity of the CANISTER confinement boundary from an analyzed side drop height of 80 inches. The 80-inch drop height envelopes the maximum height from the bottom of the STC when secured to the transfer vehicle while enroute to the HSM.

(continued)

5.0 Administrative Controls (continued)

Although analyses performed for cask drop accidents at various orientations indicate much greater resistance to damage, requiring the inspection of the CANISTER after a side drop of 15 inches or greater ensures that:

1. The CANISTER will continue to provide confinement.
2. The STC can continue to perform its design function regarding CANISTER transfer and shielding.

5.3 Concrete Testing

HSM concrete shall be tested during the fabrication process for elevated temperatures to verify that there are no significant signs of spalling or cracking and that the concrete compressive strength is greater than that assumed in the structural analysis. Tests shall be performed at or above the calculated peak temperature and for a period no less than the 40 hour duration of HSM blocked vent transient for components exceeding 500 °F.

HSM concrete temperature testing shall be performed whenever:

- There is a change in the supplier of the cement, or
- There is a change in the source of the aggregate, or
- The water-cement ratio changes by more than 0.04.

5.4 Severe Weather

Prior to the beginning of Vertical System LOADING OPERATIONS, UNLOADING OPERATIONS, and TRANSFER OPERATIONS for each loaded CANISTER, Licensee shall establish that Warnings, Watches, and Advisories indicate a SAFE CONDITION AND FORECAST.

Prior to the beginning of NUHOMS® System LOADING OPERATIONS AND UNLOADING OPERATIONS, Licensee shall establish that Warnings, Watches, and Advisories indicate a SAFE CONDITION AND FORECAST.

Enclosure 2 to E-58221

SAR Change Pages

(Public)

3.2.1.3 Not Used

3.2.1.4 Tornado Missiles

SSCs that are classified as ITS are designed for*, or administrative provisions are implemented to protect against impacts from,* tornado-generated missiles. The loaded storage overpacks are designed to remain stable and to maintain the confinement boundary when subjected to tornado-generated missiles. The Cask Handling Building (CHB) is designed to withstand tornado-generated wind loading and missiles without collapse so as to prevent reducing packaging effectiveness of casks contained within. Preventing penetration of tornado-generated missiles is not considered a CHB structural design requirement, as the casks themselves are designed to withstand these impacts. Tornado-generated missiles are not required to be considered in the design of the canister since the canister is protected by the storage overpack.

NUHOMS® equipment used during the canister transfer operations is explicitly evaluated for tornado generated missile impacts. However, NAC transfer casks are not explicitly evaluated for tornado generated missile impacts. Thus, administrative controls are implemented to prevent the opportunity for such a condition to exist. These administrative controls and requirements are detailed in Section 5.4 of the proposed Technical Specifications [3-1] for the NAC Vertical systems. Justification for use of the administrative controls to address tornado generated missile impacts is provided in Section 7.5.3.2.1.

Similarly, NAC transportation casks are not explicitly evaluated for tornado generated missile impacts. However, transportation casks are exposed to external environmental conditions during transportation and 10 CFR Part 71 requires the cask to be analyzed for conditions more severe than just a tornado generated missile condition. Examples include a 30m drop test and a 1 foot puncture drop test. All NAC transportation casks meet these requirements. Therefore, all NAC transportation casks are designed such that they can survive any tornado generated missile impacts at the WCS CISF.

Tornado missile load conditions are based on the design basis tornado addressed in Section 3.2.1.1. The evaluation cases required by NUREG-0800, Section 3.5.1.4 [3-3] include at least three objects as potential tornado missiles: a massive high kinetic energy missile which deforms on impact, a rigid missile to test penetration resistance, and a small rigid missile of a size sufficient to just pass through any openings in protective barriers. Tornado missile load cases are established in Table 1-2.

3.2.2 Water Level (Flood) Design

The WCS CISF is located in Andrews County, Texas which has a semi-arid climate with approximately 16 inches of rain per year. There are no lake systems or flowing or intermittent streams nearby.

All Indicated Changes are to address 72.122(b)

5.7 References

5-1 Proposed SNM-1050, WCS Consolidated Interim Storage Facility Technical Specifications, Amendment 0.

5-2 "Post Transport Package Evaluation," QP-10.02, Revision *2*.

5-3 *"WCS Consolidated Interim Storage Facility (CISF) Physical Security Plan," Revision 5, dated September 18, 2019.*

5-4 NUREG-0612, Control of Heavy Loads at Nuclear Power Plants, U.S. Nuclear Regulatory Commission, July 1980.

All Indicated Changes are for consistency

The objective of the CHB analysis and design for tornado missile impacts is to ensure that structural integrity and stability of the primary framing system is maintained. Therefore, only those members critical to lateral and/or vertical stability of the overall structure are required to survive under any potential tornado missile impact scenario, as demonstrated by sufficient code-based capacity to resist the combination of gravity and tornado wind, APC, and impact demands present in the design load combinations. Other members not required to survive tornado missile impact scenarios are identified as sacrificial, or not critical to structural stability. Two categories of sacrificial members are defined: 1) members that do not serve as critical elements of the overall structure primary lateral or vertical load paths and are not required for overall structural stability, such as beams not serving as collectors or struts; and 2) members that are part of the primary lateral or vertical load paths but have redundant counterparts that are assured to survive if the sacrificial member fails. This second category includes several types of horizontal struts, vertical braces, and the center 'zipper' column of each three-column set on the east-west column lines; in each of these cases the redundant framing arrangement provides secondary lateral and/or vertical load paths and stability framing in case of sacrificial member failure.

The design of sacrificial members and their connections does not require the members to remain attached to the structure after impact (i.e., the sacrificial members may themselves become airborne). This is permitted because the safety-related fuel bearing SSCs *for NUHOMS®* inside the building have been designed to resist the full spectrum of Regulatory Guide 1.76 tornado missiles representing the range of potential missiles on the plant site. The sacrificial members are considered rigid building debris components as defined in the missile criteria in Regulatory Guide 1.76 [7-35]. Chapter 12 of the appendices (A.12, B.12, etc.) demonstrate that each cask system component is designed and conservatively evaluated for the most severe tornado and missiles anywhere within the United States (Region I as defined in NRC Regulatory Guide 1.76 [7-35]), therefore, the impact of the sacrificial members on the cask systems is bounded. *Administrative Controls will be used to mitigate impacts of design-basis tornado loading for the transportation casks (during overhead crane operations) and NAC transfer casks. As described in Section 7.5.3.2.1, the transportation casks will not be moved into the building to begin the railcar unloading process unless current and forecasted weather meets the requirements described in Section 5.4 of the proposed Technical Specifications [7-78]. In addition, similar controls, as addressed in Section 3.2.1.4 and Section 5.4 of the proposed Technical Specifications, will be applicable during the time that the canisters are in the NAC transfer casks. Finally, Section 3.2.1.4 describes how the NAC transportation casks are qualified for tornado generated missile impacts.*

All Indicated Changes are to address 72.122(b)

- ASCE/SEI 4-16, Seismic Analysis of Safety-Related Nuclear Structures. Applicable to seismic analysis procedures for the Cask Handling Building and its foundations.
- ASCE/SEI 7-16, Minimum Design Loads and Associated Criteria for Buildings and Other Structures. Applicable to development of normal operating wind loads, snow and rain loads, and overhead crane operating loads.
- ASCE/SEI 7-05, Minimum Design Loads for Buildings and Other Structures. Applicable to transforming tornado wind speed into pressures applicable to the CHB, in accordance with NUREG-0800 Section 3.3.2, Tornado Loads.
- ASME NOG-1-2015, Rules for Construction of Overhead and Gantry Cranes (Top Running Bridge, Multiple Girder). Applicable to analysis and design of the two 130-ton overhead cranes supported by the CHB.
- CMAA-70 2015, Specifications for Top Running Bridge and Gantry Type Multiple Girder Electric Overhead Traveling Cranes. Applicable to design of the CHB crane runway system.

7.5.3.2.1 Load Definitions

The CHB structure is designed to withstand snow and rain in accordance with the International Building Code. In addition, it is designed to resist failure of structural members under concurrent loading by design-basis tornado winds, atmospheric pressure change (APC), and tornado missiles.

Administrative Controls will be used to mitigate impacts of design-basis tornado loading. The transportation cask will not be moved into the building to begin the railcar unloading process unless current and forecasted weather *meets the requirements described in Section 5.4 of the proposed Technical Specifications [7-78]*. Eight hours is the estimated time to move any of the casks from the railcar to a stable configuration within the CHB in which the crane is no longer overhead or adjacent. For the NUHOMS® systems, eight hours bounds the approximate time (6.4 hours for MP187 casks, 4.3 hours for MP197HB casks) from entry of the cask railcar into the CHB, to the point where the cask has been placed on the transfer skid and the overhead crane can be relocated to the south end of the CHB. For the NAC systems, eight hours bounds the approximate time (5.5 hours for NAC-STC casks, 6.5 hours for NAC-UTC casks, and 8 hours for NAC-MAGNATRAN casks) from entry of the cask railcar into the CHB, to placement of the canister on the Canister Transfer Facility pad, at which point the overhead crane will no longer be overhead or adjacent to the cask on the railcar. Estimated time to perform cask receipt and transfer activities are provided as occupancy times in the occupational collective dose tables in each cask model's respective Appendix, refer to Tables A.9-2, B.9-2, C.9-2, D.9-2, E.9-1, F.9-1, and G.9-1.

All Indicated Changes are to address 72.122(b)

Administrative controls will restrict the movement of the overhead crane such that it will remain in the south-most bay of the CHB once railcar unloading has been completed. Administrative controls will prohibit additional non-empty casks on railcars inside the CHB, and thus adjacent to the crane, until the previous cask has been removed from the CHB and the next unloading evolution can proceed, weather conditions permitting. Similarly, for railcar loading operations following retrieval of a loaded canister, the loading process will not be permitted to proceed unless current and forecasted weather indicate safe weather conditions *in accordance with Section 5.4 of the proposed Technical Specifications [7-78]*. These actions eliminate the potential for collapse of overhead cranes onto canisters during receipt, transfer, and retrieval operations (with storage operations occurring outside the CHB).

Also, administrative controls are used to demonstrate compliance with 72.122(b) when the canisters are being transferred in the NAC transfer casks. NAC canister transfer operations typically take around 6 hours to complete. This is from the time the canister is lifted off the bottom of the transportation cask cavity, moved over to the VCC and lowered until it is resting on the VCC pedestal. This is consistent with the times estimated in Tables E.9-1, F.9-1 and G.9-1 for the NAC systems. Removal of the last three transportation cask lid bolts and installation of at least six lid bolts in the loaded VCC adds an estimated additional two hours to the transfer operation. Therefore, removal of the last three bolts from the transportation cask and the ensuing transfer operations will not be permitted unless current and forecasted weather meets the requirements described in Section 5.4 of the proposed Technical Specifications. (See Section 5.4 of the proposed Technical Specifications [7-78]) Thus, the total transfer time is typically 8 hours (i.e., 6 hours to complete the lifts and 2 hours to install the bolts for a total of 8 hours). Steps will be taken to improve on these times such as staging equipment in an efficient manner. Once the transportation casks for the Vertical Systems are moved into the CHB, Loading/Unloading and transfer operations will be performed in an expeditious manner to place the canister into the VCC.

All Indicated Changes are to address 72.122(b)

A safe condition and forecast is considered to be the absence of: Tornado and Severe Thunderstorm Watches, Tornado and Severe Thunderstorm Warnings, and *Hazardous Weather Outlook indicating a moderate to high risk of severe thunderstorms for the current date (Day 1)*. Weather forecasts will be accessed from the NOAA Weather Forecast Office prior to each railcar loading/unloading. The nearest NOAA Weather Forecast Office to the CISF is the Midland/Odessa Office. Administrative controls triggered by the presence of Tornado and Severe Thunderstorm Watches, Tornado and Severe Thunderstorm Warnings *or a Hazardous Weather Outlook indicating a moderate to high risk of severe thunderstorms for the current date (Day 1)* ensure avoidance of atmospheric conditions which are favorable for the development of severe thunderstorms capable of producing tornados within the *specified period of time. In addition, as documented in Section 2.3.3.3 of the SAR only two (2) F2 Class tornadoes have been recorded in Andrews County, TX from 1950 through 2015 according to data from the National Oceanic and Atmospheric Administration (NOAA) and only eight (8) F1 Class tornadoes. Therefore, the risk of an unexpected tornado within eight hours of the time that no severe weather is predicted is extremely remote.*

This section describes loads, loading combinations and analysis methods to be met for design of the WCS CISF reinforced concrete and structural steel structures.

<u>Loads</u>

Loads used in analysis and design of CHB structure include the following:

- D Dead load
- L Live load
- C – Crane operating and lifted (hoist) loads
- S – Snow load
- H lateral soil pressure load
- T_o Thermal load
- W Wind load
- W_t Tornado load
- F’ Flood load
- E’ Design Basis Earthquake seismic load

All Indicated Changes are to address 72.122(b)

7.6.6 Transport Cask Stability

During cask receipt operations, the Cask Handling Building (CHB) crane will remove the transport casks from the conveyances (railcar, heavy haul, etc.) and stage the transport casks, vertically, on the CHB floor. A vertical cask transporter (VCT) will drive up to the transport cask, engage for lifting, and raise the cask for movement to the Canister Transfer System (CTS). The transport cask is then staged in the CTS for transferring the contents into the storage overpack.

During the operations process described above, the transport casks will be standing vertically, unrestrained, for some time. An evaluation has been performed to determine if during a seismic event there is any potential for tip-over of the transport casks. As noted in Section 7.5.3.2.1, administrative controls will be used to mitigate certain impacts of design-basis tornado loading. The transportation cask will not be moved into the building to begin the railcar unloading process unless current and forecasted weather *indicates safe condition and forecast, as described in proposed Technical Specification 5.4 [7-78]*.

7.6.6.1 Design Basis

The objective of the evaluation is to follow the guidelines in 10CFR72 and calculate the factors of safety (FS) for three different NAC transport casks (STC, UMS, and MAGNATRAN) to withstand a design basis seismic event at the WCS CISF site located at Andrews County, Texas. The maximum design basis seismic event is 0.261g [7-33].

7.6.6.2 Design Input

WCS-12-05-100-001, Rev. 0 “Site-Specific Seismic Hazard Evaluation and Development of Seismic Design Ground Motions” [7-33].

7.6.6.3 Assumptions

- For casks that are identical in exterior dimensions but configured with different types of fuels, evaluation of the configuration with the highest location of Center of Gravity (CG) is the most conservative to withstand the seismic tip-over event.

  Basis: The primary overturning moment is the product of (height of CG measured from the base corner) × (horizontal seismic force measured in fraction of gravity). Therefore, the higher the CG position, the greater the overturning moment.

- The pivot point of the tip-over event is the extreme outer corner of the cask bottom support plate.

  Basis: By kinematics, the pivot point and the Center of gravity form a vertical line at the threshold of instability of the cask during a tip-over event.

All Indicated Changes are to address 72.122(b)

B.3.2 NAC-MPC SYSTEM Integrity

B.3.2.1 CANISTER Maximum Time in the TRANSFER CASK

BASES

BACKGROUND	During TRANSFER OPERATIONS or prior to TRANSPORT OPERATIONS, a loaded CANISTER is transferred from one VCC to another VCC (or a TRANSPORTATION CASK) using the TRANSFER CASK. The TRANSFER CASK is placed on the VCC (or a TRANSPORTATION CASK), the bottom doors are opened, the loaded CANISTER is lifted into the TRANSFER CASK cavity, the bottom shield doors are closed and the CANISTER is lowered until it rests on the bottom doors. Subsequently, the loaded TRANSFER CASK is placed on another VCC (or TRANSPORTATION CASK) and the procedure is reversed, lowering the loaded CANISTER into another VCC (or TRANSPORTATION CASK). The LCO limits the total time a CANISTER can be maintained in the TRANSFER CASK to 25 days (600 hrs).
APPLICABLE SAFETY ANALYSIS .	Limiting the total time that a loaded CANISTER backfilled with helium may be in the TRANSFER CASK, prior to placement in a VCC, or TRANSPORTATION CASK, precludes the inappropriate use of the TRANSFER CASK as a storage component. The thermal analyses in the NAC-MPC Final Safety Analysis Report show that the short-term temperature limits for the spent fuel cladding are not exceeded for an unlimited period of time (steady state analysis). The duration of 25 days (600 hrs) is defined based on a test time of 30 days for abnormal regimes as described in PNL-4835.

BASES

LCO	Limiting the length of time that the loaded CANISTER backfilled with helium is allowed to remain in the TRANSFER CASK ensures that the TRANSFER CASK is not inappropriately used as a storage component.
APPLICABILITY	The elapsed time restrictions on a loaded CANISTER in the TRANSFER CASK apply during TRANSFER OPERATIONS and prior to TRANSPORT OPERATIONS.
ACTIONS	A note has been added to the ACTIONS, which states that, for this LCO, separate Condition entry is allowed for each NAC-MPC system. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory measures for each NAC-MPC system not meeting the LCO. Subsequent NAC-MPC systems that do not meet the LCO are governed by subsequent Condition entry and application of associated Required Actions. A.1 Complete CANISTER TRANSPORTATION CASK. B.1 Return CANISTER to TRANSPORTATION CASK or VCC.
SURVEILLANCE REQUIREMENTS .	SR 3.2.1.1 Verify CANISTER transfer complete.
REFERENCES	NAC-MPC FSAR Sections 4.4, 4.5, 4.A.3, 8.1, 8.2, 8.3, 8.A.1, 8.A.2 and 8.A.3.

B.3.3 NAC-UMS SYSTEM Integrity

B.3.3.1 CANISTER Maximum Time in the TRANSFER CASK

BASES

BACKGROUND	The cumulative time a loaded, helium backfilled CANISTER may remain in the TRANSFER CASK is limited to 600 hours. This limit ensures that the test duration of 30 days (720 hours) considered in PNL-4835 for zirconium alloy clad fuel for storage in air is not exceeded and ensures that the TRANSFER CASK is used as intended. The time limit is established to preclude long-term storage of a loaded CANISTER in the TRANSFER CASK. For heat loads less than or equal to 20kW (PWR) forced air cooling is not required. The maximum heat load allowed by NAC-UMS TRANSPORTATION CASK for the shipment of Maine Yankee fuel is 19.92 kW.
APPLICABLE SAFETY ANALYSIS	Analyses reported in the NAC-UMS Safety Analysis Report for heat loads of 20 kW or less (PWR), and with the CANISTER backfilled with helium, the analysis shows that the fuel cladding and CANISTER components reach a steady-state temperature below the short-term allowable temperatures. Therefore, the time in the TRANSFER CASK is limited to 600 hours. This limit ensures that the test duration of 30 days (720 hours) considered in PNL 4835 for zirconium alloy clad fuel for storage in air is not exceeded and ensures that the TRANSFER CASK is used as intended. Since the 600 hours is significantly less than the 720 hours considered in PNL-4835, operation in the TRANSFER CASK to this period is acceptable.

BASES

LCO	For PWR heat loads less than or equal to 20 kW, the thermal analysis shows that the presence of helium in the CANISTER is sufficient to maintain the fuel cladding and CANISTER component temperatures below the short term temperature limits. Therefore, forced air cooling is not required for these heat load conditions. Therefore, the CANISTER may remain in the TRANSFER CASK for up to 600 hours, where the time limit is based on the test duration of 30 days (720 hours) considered in PNL 4835 for zirconium alloy clad fuel for storage in air rather than on temperature limits.
APPLICABILITY	During TRANSFER OPERATIONS the TRANSFER CASK active cooling system must be in operation or the time limits specified must be adhered to. This LCO is applicable once a CANISTER is lifted off the VCC pedestal or the TRANSPORTATION CASK is no longer in the horizontal orientation.
ACTIONS	A note has been added to the ACTIONS, which states that, for this LCO, separate Condition entry is allowed for each NAC-UMS® system. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory measures for each NAC-UMS® system not meeting the LCO. Subsequent NAC-UMS® systems that do not meet the LCO are governed by subsequent Condition entry and application of associated Required Actions. A note has been added to Condition A that reminds users that all time spent in Condition A is included in the 600-hour cumulative limit. If the LCO 3.3.1. 600-hour cumulative time limit is exceeded: A.1 The CANISTER shall be placed in a VCC. <u>OR</u> A.2 The CANISTER shall be placed in a TRANSPORTATION CASK.

B.3.4 MAGNASTOR SYSTEM Integrity

B.3.4.1 CANISTER Maximum Time in the TRANSFER CASK

BASES

BACKGROUND	When a MAGNASTOR CANISTER is lifted off a VCC pedestal or when the MAGNATRAN TRANSPORTATION CASK is no longer in the horizontal orientation, there are time limits with completing the transfer from a TRANSPORTATION CASK to a VCC and vice versa without the TRANSFER CASK active cooling system in operation.
APPLICABLE SAFETY ANALYSIS	To protect the fuel cladding from exceeding allowable temperature limits, the TRANSFER CASK active cooling system must be running or the transfer from a TRANSPORTATION CASK to a VCC and vice versa must be completed within a maximum timeframe.

BASES

ACTIONS

A note has been added to the ACTIONS, which states that, for this LCO, separate Condition entry is allowed for each CANISTER. This is acceptable as the Required Actions for each Condition provide appropriate compensatory measures for each CANISTER not meeting the LCO. Subsequent CANISTERS that do not meet the LCO are governed by subsequent Condition entry and application of associated Required Actions.

A.1
If the TRANSFER OPERATIONS is not going to be completed in time, the CANISTER must be returned to the TRANSFER CASK immediately.

AND

A.2
The TRANSFER CASK active cooling system must be operational immediately.

AND

A.3
The TRANSFER CASK active cooling system must be operational for at least 24 hours before attempting a subsequent transfer attempt.