# APPENDIX

# TECHNICAL SPECIFICATIONS

**FOR THE**

# DIABLO CANYON
# INDEPENDENT SPENT FUEL STORAGE INSTALLATION

**Docket No. 72-26**

**Materials License No. SNM-2511**

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# 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.
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| 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. |
| CASK TRANSFER FACILITY (CTF) | The CASK TRANSFER FACILITY includes the following components and equipment: (1) a structure used to stabilize the OVERPACK during lifts involving spent fuel not bounded by 10 CFR 50, and (2) either a stationary lifting device or mobile lifting device used to lift the OVERPACK, TRANSFER CASK, and MPC. |
| DAMAGED FUEL ASSEMBLY | DAMAGED FUEL ASSEMBLIES are fuel assemblies with known or suspected cladding defects, as determined by a review of records, greater than pinhole leaks or hairline cracks, empty fuel rod locations that are not filled with solid Zircaloy or stainless steel rods, or those that cannot be handled by normal means. DAMAGED FUEL ASSEMBLIES if stored in an MPC, must be stored in a DAMAGED FUEL CONTAINER. |
| DAMAGED FUEL CONTAINER (DFC) | DFCs are specially designed enclosures for DAMAGED FUEL ASSEMBLIES or FUEL DEBRIS that permit gaseous and liquid media to escape to the atmosphere in the MPC, while minimizing dispersal of gross particulates within the MPC. A DFC can hold one DAMAGED FUEL ASSEMBLY or an amount of FUEL DEBRIS equivalent to that of an INTACT FUEL ASSEMBLY. |
| FUEL DEBRIS | FUEL DEBRIS is ruptured fuel rods, severed rods, loose fuel pellets or fuel assemblies with known or suspected defects, which cannot be handled by normal means due to fuel cladding damage. |

(continued)

1.1 Definitions (continued)

| | |
|---|---|
| INTACT FUEL ASSEMBLY | INTACT FUEL ASSEMBLY is a fuel assembly without known or suspected cladding defects greater than pinhole leaks or hairline cracks and which can be handled by normal means. A fuel assembly shall not be classified as INTACT FUEL ASSEMBLY unless solid Zircaloy or stainless steel rods are used to replace missing fuel rods and which displace an amount of water equal to that displaced by the original fuel rod(s). |
| LOADING OPERATIONS | LOADING OPERATIONS include all licensed activities on a TRANSFER CASK while its contained MPC is being loaded with its approved contents. LOADING OPERATIONS begin when the first fuel assembly is placed in the MPC and end when the TRANSFER CASK is suspended from or secured on the transporter. LOADING OPERATIONS does not include MPC transfer between the TRANSFER CASK and the OVERPACK. |
| MULTI-PURPOSE CANISTER (MPC) | MPC is a sealed SPENT NUCLEAR FUEL container that consists of a honeycombed fuel basket contained in a cylindrical canister shell which is welded to a baseplate, lid with welded port cover plates, and closure ring. The MPC provides the confinement boundary for the contained radioactive materials. |
| NONFUEL HARDWARE | NONFUEL HARDWARE is defined as burnable poison rod assemblies (BPRAs), thimble plug devices (TPDs), rod control cluster assemblies (RCCAs), and wet annular burnable absorbers (WABAs). |
| OPERABLE/OPERABILITY | A system, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety function(s) and when all necessary attendant instruments, controls, normal or emergency electrical power, and other auxiliary equipment that are required for the system, component, or device to perform its specific safety function(s) are also capable of performing their related support function(s). |
| OVERPACK | OVERPACK is a cask that receives and contains a sealed MPC for interim storage in the independent spent fuel storage installation (ISFSI). It provides gamma and neutron shielding, and provides for ventilated air flow to promote heat transfer from the MPC to the environs. The OVERPACK does not include the TRANSFER CASK. |

(continued)

1.1 Definitions (continued)

| | |
|---|---|
| SPENT FUEL STORAGE CASKS (SFSCs) | SFSCs are containers approved for the storage of spent fuel assemblies, FUEL DEBRIS, and associated NONFUEL HARDWARE at the ISFSI. The HI-STORM 100 SFSC System consists of the OVERPACK and its integral MPC loaded with any approved contents. |
| SPENT NUCLEAR FUEL | SPENT NUCLEAR FUEL means fuel that has been withdrawn from a nuclear reactor following irradiation, has undergone at least one year's decay since being used as a source of energy in a power reactor and has not been chemically separated into its constituent elements by reprocessing. SPENT NUCLEAR FUEL includes the special nuclear material, byproduct material, source material, and other radioactive materials associated with fuel assemblies. |
| STORAGE OPERATIONS | STORAGE OPERATIONS include all licensed activities that are performed at the ISFSI while a SFSC containing approved contents is sitting on a storage pad within the ISFSI perimeter. STORAGE OPERATIONS does not include MPC transfer between the TRANSFER CASK and the OVERPACK. |
| TRANSFER CASK | TRANSFER CASKs are containers designed to contain the MPC during and after loading of its approved contents and to transfer the loaded MPC to or from the OVERPACK. |
| TRANSPORT OPERATIONS | TRANSPORT OPERATIONS include all licensed activities performed on an OVERPACK or TRANSFER CASK loaded with any approved contents when it is being moved to and from the ISFSI. TRANSPORT OPERATIONS begin when the OVERPACK or TRANSFER CASK is first suspended from or secured on the transporter and end when the OVERPACK or TRANSFER CASK is at its destination and no longer secured on or suspended from the transporter. TRANSPORT OPERATIONS include transfer of the MPC between the OVERPACK and the TRANSFER CASK. |

(continued)

1.1 Definitions (continued)

| | |
|---|---|
| UNLOADING OPERATIONS | UNLOADING OPERATIONS include all licensed activities on a TRANSFER CASK while its contained MPC is being unloaded of its approved contents. UNLOADING OPERATIONS begin when the TRANSFER CASK is no longer suspended from or secured on the transporter and end when the last of its approved contents is removed from the MPC. UNLOADING OPERATIONS do not include MPC transfer between the TRANSFER CASK and the OVERPACK. |

# 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 not met. | A.1 Verify......<br>AND<br>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

EXAMPLES
(continued)

EXAMPLE 1.2-2

ACTIONS

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. LCO not met. | A.1 | Stop..... | |
| | OR | | |
| | A.2.1 | Verify.... | |
| | AND | | |
| | 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 can fail to be met. Specified with each stated Condition are Required Action(s) and Completion Time(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 cask system 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 cask system is not within the LCO Applicability.<br><br>Once a Condition has been entered, subsequent subsystems, components, or variables expressed in the Condition, discovered to be not within limits, will <u>not</u> 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. |

(continued)

1.3 Completion Times (continued)

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 | 12 hours |
| | AND | |
| | B.2 Perform Action B.2 | 36 hours |

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.

(continued)

1.3 Completion Times

EXAMPLES (continued)

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 Complete action B.1.<br><br>AND<br><br>B.2 Complete action B.2. | 12 hours<br><br><br><br>36 hours |

When a system is determined not to 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, Conditions A and B are exited, and therefore, the Required Actions of Condition B may be terminated.

(continued)

1.3 Completion Times

EXAMPLES (continued)

EXAMPLE 1.3-3

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 Complete action B.1<br><br>AND<br><br>B.2 Complete action B.2 | 6 hours<br><br><br><br>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.<br><br>The "specified Frequency" is referred to throughout this section and each of the Specifications of Section 3.0, Surveillance Requirement (SR) Applicability. The "specified Frequency" consists of the requirements of the Frequency column of each SR.<br><br>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 an 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 interval specified in the 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 or variables are outside specified limits, or the facility 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

EXAMPLES
(continued)

EXAMPLE 1.4-2

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | FREQUENCY |
|---|---|
| Verify flow is within limits. | Once within 12 hours prior to starting activity<br><br>AND<br><br>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" indicated that both Frequency requirements must be met. Each time the example activity is to be performed, the Surveillance must be performed within 12 hours 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 percent extension allowed by SR 3.0.2.

"Thereafter" indicated 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 cancelled or not performed, the measurement of both intervals stops. New intervals start upon preparing to restart the specified activity.

# 2.0 APPROVED CONTENTS

## 2.1 Functional and Operating Limits

### 2.1.1 Contents To Be Stored

a. INTACT FUEL ASSEMBLIES, DAMAGED FUEL ASSEMBLIES, FUEL DEBRIS, and NONFUEL HARDWARE meeting the limits specified in Tables 2.1-1 through 2.1-10 may be stored in the SFSC System.

b. For MPCs partially loaded with DAMAGED FUEL ASSEMBLIES or FUEL DEBRIS, all remaining INTACT FUEL ASSEMBLIES in the MPC shall meet the decay heat generation limits for the DAMAGED FUEL ASSEMBLIES. This requirement applies only to uniform fuel loading.

### 2.1.2 Uniform and Preferential Fuel Loading

Fuel assemblies used in uniform or preferential fuel loading shall meet all applicable limits specified in Tables 2.1-1 through 2.1-5. Fuel assembly burnup, decay heat, and cooling time limits for uniform loading are specified in Tables 2.1-6 and 2.1-7. Preferential fuel loading shall be used during uniform loading (i.e., any authorized fuel assembly in any fuel storage location) whenever fuel assemblies with significantly different post-irradiation cooling times (≥ 1 year) are to be loaded in the same MPC. Fuel assemblies with the longest post-irradiation cooling times shall be loaded into fuel storage locations at the periphery of the basket. Fuel assemblies with shorter post-irradiation cooling times shall be placed toward the center of the basket. Regionalized fuel loading as described in Technical Specification 2.1.3 below meets the intent of preferential fuel loading.

### 2.1.3 Regionalized Fuel Loading

Fuel may be stored using regionalized loading in lieu of uniform loading to allow higher heat emitting fuel assemblies to be stored than would otherwise be able to be stored using uniform loading. Figures 2.1-1 through 2.1-3 define the regions for the MPC-24; MPC-24E/MPC-24EF; and MPC-32 models, respectively. Fuel assembly burnup, decay heat, and cooling time limits for regionalized loading are specified in Tables 2.1-8 and 2.1-9. In addition, fuel assemblies used in regionalized loading shall meet all other applicable limits specified in Tables 2.1-1 through 2.1-5. Limitations on NONFUEL HARDWARE to be stored with their associated fuel assemblies are provided in Table 2.1-10.

## 2.2 Functional and Operating Limits Violations

If any Fuel Specifications or Loading Conditions of 2.1 are violated, the following ACTIONS shall be completed:

a. The affected fuel assemblies shall be placed in a safe condition.

b. Within 24 hours, notify the NRC Operations Center.

c Within 30 days, submit a special report which describes the cause of the violation, and ACTIONS taken to restore compliance and prevent recurrence.

TABLE 2.1-1

MPC-24 FUEL ASSEMBLY LIMITS

A. Allowable Contents

1. Uranium oxide, INTACT FUEL ASSEMBLIES listed in Table 2.1-5, with or without NONFUEL HARDWARE and meeting the following specifications (Note 1):

| | |
|---|---|
| Cladding type | Zr (Note 2) |
| Initial enrichment | As specified in Table 2.1-5 for the applicable fuel assembly. |
| Post-irradiation cooling time and average burnup per assembly: | |
| Fuel | As specified in Tables 2.1-6 or 2.1-8. |
| NONFUEL HARDWARE | As specified in Table 2.1-10. |
| Decay heat per assembly | As specified in Tables 2.1-7 or 2.1-9. |
| Fuel assembly length | ≤ 176.8 inches (nominal design) |
| Fuel assembly width | ≤ 8.54 inches (nominal design) |
| Fuel assembly weight | ≤ 1,680 lb (including NONFUEL HARDWARE) |

B. Quantity per MPC: Up to 24 fuel assemblies.

C. DAMAGED FUEL ASSEMBLIES and FUEL DEBRIS are not authorized for loading into the MPC-24.

NOTE 1: Fuel assemblies containing BPRAs, WABAs, or TPDs may be stored in any fuel cell location. Fuel assemblies containing RCCAs may only be loaded in fuel storage locations 9, 10, 15, and/or 16 of Figure 2.1-1. These requirements are in addition to any other requirements specified for uniform or regionalized fuel loading.

NOTE 2: Zr designates fuel-cladding material made of Zircaloy-2, Zircaloy-4 and ZIRLO.

TABLE 2.1-2 Sheet 1 of 2

MPC-24E FUEL ASSEMBLY LIMITS

A. Allowable Contents

1. Uranium oxide, INTACT FUEL ASSEMBLIES listed in Table 2.1-5, with or without NONFUEL HARDWARE and meeting the following specifications (Note 1):

| | |
|---|---|
| Cladding type | Zr (Note 2) |
| Initial enrichment | As specified in Table 2.1-5 for the applicable fuel assembly. |
| Post-irradiation cooling time and average burnup per assembly | |
| Fuel | As specified in Tables 2.1-6 or 2.1-8. |
| NONFUEL HARDWARE | As specified in Table 2.1-10. |
| Decay heat per assembly | As specified in Tables 2.1-7 or 2.1-9. |
| Fuel assembly length | ≤ 176.8 inches (nominal design) |
| Fuel assembly width | ≤ 8.54 inches (nominal design) |
| Fuel assembly weight | ≤ 1,680 lb (including NONFUEL HARDWARE) |

2. Uranium oxide, DAMAGED FUEL ASSEMBLIES, with or without NONFUEL HARDWARE, placed in DAMAGED FUEL CONTAINERS. Uranium oxide DAMAGED FUEL ASSEMBLIES shall meet the criteria specified in Table 2.1-5 and meet the following specifications (Note 1):

| | |
|---|---|
| Cladding type | Zr (Note 2) |
| Initial enrichment | ≤ 4.0 wt% $^{235}$U. |
| Post-irradiation cooling time and average burnup per assembly: | |
| Fuel | As specified in Tables 2.1-6 or 2.1-8. |
| NONFUEL HARDWARE | As specified in Table 2.1-10. |
| Decay heat per assembly | As specified in Tables 2.1-7 or 2.1-9. |
| Fuel assembly length | ≤ 176.8 inches (nominal design) |
| Fuel assembly width | ≤ 8.54 inches (nominal design) |
| Fuel assembly weight | ≤ 1,680 lb (including NONFUEL HARDWARE and DFC) |

TABLE 2.1-2 Sheet 2 of 2

B. Quantity per MPC: Up to four (4) DAMAGED FUEL ASSEMBLIES in DAMAGED FUEL CONTAINERS, stored in fuel storage locations 3, 6, 19 and/or 22 of Figure 2.1-2. The remaining MPC-24E fuel storage locations may be filled with INTACT FUEL ASSEMBLIES meeting the applicable specifications.

C. FUEL DEBRIS is not authorized for loading in the MPC-24E.

NOTE 1: Fuel assemblies containing BPRAs, WABAs, or TPDs may be stored in any fuel storage location. Fuel assemblies containing RCCAs must be loaded in fuel storage locations 9, 10, 15 and/or 16 of Figure 2.1-2. These requirements are in addition to any other requirements specified for uniform or regionalized fuel loading.

NOTE 2: Zr designates fuel-cladding material, which is made of Zircaloy-2, Zircaloy-4 and ZIRLO.

TABLE 2.1-3



MPC-24EF FUEL ASSEMBLY LIMITS

A. Allowable Contents

1. Uranium oxide, INTACT FUEL ASSEMBLIES listed in Table 2.1-5, with or without NONFUEL HARDWARE and meeting the following specifications (Note 1):

| | |
|---|---|
| Cladding type | Zr (Note 3) |
| Initial enrichment | As specified in Table 2.1-5 for the applicable fuel assembly. |
| Post-irradiation cooling time and average burnup per assembly: | |
| Fuel | As specified in Tables 2.1-6 or 2.1-8. |
| NONFUEL HARDWARE | As specified in Table 2.1-10. |
| Decay heat per assembly | As specified in Tables 2.1-7 or 2.1-9. |
| Fuel assembly length | ≤ 176.8 inches (nominal design) |
| Fuel assembly width | ≤ 8.54 inches (nominal design) |
| Fuel assembly weight | ≤ 1,680 lb (including NONFUEL HARDWARE) |

2. Uranium oxide, DAMAGED FUEL ASSEMBLIES and FUEL DEBRIS, with or without NONFUEL HARDWARE, placed in DAMAGED FUEL CONTAINERS. Uranium oxide DAMAGED FUEL ASSEMBLIES shall meet the criteria specified in Table 2.1-5 and meet the following specifications (Note 1 and 2):

| | |
|---|---|
| Cladding type | Zr (Note 3) |
| Initial enrichment | ≤ 4.0 wt% $^{235}$U. |
| Post-irradiation cooling time and average burnup per assembly | |
| Fuel | As specified in Tables 2.1-6 or 2.1-8. |
| NONFUEL HARDWARE | As specified in Table 2.1-10. |
| Decay heat per assembly | As specified in Tables 2.1-7 or 2.1-9. |
| Fuel assembly length | ≤ 176.8 inches (nominal design) |
| Fuel assembly width | ≤ 8.54 inches (nominal design) |
| Fuel assembly weight | ≤ 1,680 lb (including NONFUEL HARDWARE and DFC) |

TABLE 2.1-3 Sheet 2 of 2

B. Quantity per MPC: Up to four (4) DAMAGED FUEL ASSEMBLIES and/or FUEL DEBRIS in DAMAGED FUEL CONTAINERS, stored in fuel storage locations 3, 6, 19 and/or 22 of Figure 2.1-2. The remaining MPC-24EF fuel storage locations may be filled with INTACT FUEL ASSEMBLIES meeting the applicable specifications.

NOTE 1: Fuel assemblies containing BPRAs, WABAs, or TPDs may be stored in any fuel storage location. Fuel assemblies containing RCCAs must be loaded in fuel storage locations 9, 10, 15 and/or 16 of Figure 2.1-2. These requirements are in addition to any other requirements specified for uniform or regionalized fuel loading.

NOTE 2: The total quantity of FUEL DEBRIS permitted in a single DAMAGED FUEL CONTAINER is limited to the equivalent weight and special nuclear material quantity of one INTACT FUEL ASSEMBLY.

NOTE 3: Zr designates fuel-cladding material, which is made of Zircaloy-2, Zircaloy-4 and ZIRLO.

TABLE 2.1-4

MPC-32 FUEL ASSEMBLY LIMITS

A. Allowable Contents

1. Uranium oxide, INTACT FUEL ASSEMBLIES listed in Table 2.1-5, with or without NONFUEL HARDWARE and meeting the following specifications (Note 1):

| | |
|---|---|
| Cladding type | Zr (Note 2) |
| Initial enrichment | As specified in Table 2.1-5 for the applicable fuel assembly. |
| Post-irradiation cooling time and average burnup per assembly: | |
| Fuel | As specified in Tables 2.1-6 or 2.1-8. |
| NONFUEL HARDWARE | As specified in Table 2.1-10. |
| Decay heat per assembly | As specified in Tables 2.1-7 or 2.1-9. |
| Fuel assembly length | $\leq$ 176.8 inches (nominal design) |
| Fuel assembly width | $\leq$ 8.54 inches (nominal design) |
| Fuel assembly weight | $\leq$ 1,680 lb (including NONFUEL HARDWARE) |

B. Quantity per MPC: Up to 32 intact fuel assemblies.

C. DAMAGED FUEL ASSEMBLIES and FUEL DEBRIS are not authorized for loading in the MPC-32.

NOTE 1: Fuel assemblies containing BPRAs, WABAs, or TPDs may be stored in any fuel storage location. Fuel assemblies containing RCCAs must be loaded in fuel storage locations 13, 14, 19 and/or 20 of Figure 2.1-3. These requirements are in addition to any other requirements specified for uniform or regionalized fuel loading.

NOTE 2: Zr designates fuel-cladding material, which is made of Zircaloy-2, Zircaloy-4 and ZIRLO.

TABLE 2.1-5

FUEL ASSEMBLY CHARACTERISTICS (Note 1)

| Fuel Assembly Type | Vantage 5 | Standard or LOPAR |
|---|---|---|
| Cladding Material | Zr (Note 5) | Zr (Note 5) |
| Design Initial U (kg/assy.) (Note 2) | ≤ 467 | ≤ 467 |
| Initial Enrichment (MPC-24, 24E, and 24EF without soluble boron credit) (wt% $^{235}$U) (Note 4) | ≤ 4.0 (24)<br>≤ 4.4 (24E/24EF) | ≤ 4.0 (24)<br>≤ 4.4 (24E/24EF) |
| Initial Enrichment (MPC-24, 24E, 24EF, or 32 with soluble boron credit) (wt% $^{235}$U) (Notes 3 and 4) | ≤ 5.0 | ≤ 5.0 |
| No. of Fuel Rod Locations | 264 | 264 |
| Fuel Rod Cladding O.D. (in.) | ≥ 0.360 | ≥ 0.372 |
| Fuel Rod Cladding I.D. (in.) | ≤ 0.3150 | ≤ 0.3310 |
| Fuel Pellet Dia. (in.) | ≤ 0.3088 | ≤ 0.3232 |
| Fuel Rod Pitch (in.) | ≤ 0.496 | ≤ 0.496 |
| Active Fuel Length (in.) | ≤ 150 | ≤ 150 |
| No. of Guide and/or Instrument Tubes | 25 | 25 |
| Guide/Instrument Tube Thickness (in.) | ≥ 0.016 | ≥ 0.014 |

NOTE 1: All dimensions are design nominal values. Maximum and minimum dimensions are specified to bound variations in design nominal values among fuel assemblies.

NOTE 2: Design initial uranium weight is the nominal uranium weight specified for each assembly by the fuel manufacturer or DCPP. For each fuel assembly, the total uranium weight limit specified in this table may be increased up to 2.0 percent for comparison with DCPP fuel records to account for manufacturer's tolerances.

NOTE 3: Soluble boron concentration per Technical Specification LCO 3.2.1.

NOTE 4: For those MPCs loaded with both INTACT FUEL ASSEMBLIES and DAMAGED FUEL ASSEMBLIES or FUEL DEBRIS, the maximum initial enrichment of the INTACT FUEL ASSEMBLIES is limited to the maximum initial enrichment of the DAMAGED FUEL ASSEMBLIES and FUEL DEBRIS (i.e., 4.0 wt.% $^{235}$U).

NOTE 5: Zr designates fuel-cladding material, which is made of Zircaloy-2, Zircaloy-4 and ZIRLO.

TABLE 2.1-6

FUEL ASSEMBLY COOLING AND MAXIMUM AVERAGE BURNUP
(UNIFORM FUEL LOADING)

| Post-Irradiation Cooling Time (years) | MPC-24 Assembly Burnup (INTACT FUEL ASSEMBLIES) (MWD/MTU) | MPC-24E/24EF Assembly Burnup (INTACT FUEL ASSEMBLIES) (MWD/MTU) | MPC-24E/24EF Assembly Burnup (DAMAGED FUEL ASSEMBLIES and FUEL DEBRIS) (MWD/MTU) | MPC-32 Assembly Burnup (INTACT FUEL ASSEMBLIES) (MWD/MTU) |
|---|---|---|---|---|
| ≥ 5 | 40,600 | 41,100 | 39,200 | 32,200 |
| ≥ 6 | 45,000 | 45,000 | 43,700 | 36,500 |
| ≥ 7 | - | - | 44,500 | 37,500 |
| ≥ 8 | - | - | 45,000 | 39,900 |
| ≥ 9 | - | - | - | 41,500 |
| ≥ 10 | - | - | - | 42,900 |
| ≥ 11 | - | - | - | 44,100 |
| ≥ 12 | - | - | - | 45,000 |
| ≥ 13 | - | - | - | - |
| ≥ 14 | - | - | - | - |
| ≥ 15 | - | - | - | - |

NOTE 1: Linear interpolation between points is permitted.
NOTE 2: Burnup for fuel assemblies with cladding made of ZIRLO is limited to 45,000 MWD/MTU or the value in this table, whichever is less.

TABLE 2.1-7

FUEL ASSEMBLY COOLING AND MAXIMUM DECAY HEAT
(UNIFORM FUEL LOADING)

| Post-Irradiation Cooling Time (years) | MPC-24 Assembly Decay Heat (INTACT FUEL ASSEMBLIES) (Watts) | MPC-24E/24EF Assembly Decay Heat (INTACT FUEL ASSEMBLIES) (Watts) | MPC-24E/24EF Assembly Decay Heat (DAMAGED FUEL ASSEMBLIES and FUEL DEBRIS) (Watts) | MPC-32 Assembly Decay Heat (INTACT FUEL ASSEMBLIES) (Watts) |
|---|---|---|---|---|
| ≥ 5 | 1157 | 1173 | 1115 | 898 |
| ≥ 6 | 1123 | 1138 | 1081 | 873 |
| ≥ 7 | 1030 | 1043 | 991 | 805 |
| ≥ 8 | 1020 | 1033 | 981 | 800 |
| ≥ 9 | 1010 | 1023 | 972 | 794 |
| ≥ 10 | 1000 | 1012 | 962 | 789 |
| ≥ 11 | 996 | 1008 | 958 | 785 |
| ≥ 12 | 992 | 1004 | 954 | 782 |
| ≥ 13 | 987 | 999 | 949 | 773 |
| ≥ 14 | 983 | 995 | 945 | 769 |
| ≥ 15 | 979 | 991 | 941 | 766 |

NOTE 1: Linear interpolation between points is permitted.

NOTE 2: Includes all sources of heat (i.e., fuel and NONFUEL HARDWARE).

TABLE 2.1-8

FUEL ASSEMBLY COOLING AND MAXIMUM AVERAGE BURNUP
(REGIONALIZED FUEL LOADING)

| Post-Irradiation Cooling Time (years) | MPC-24 Assembly Burnup for Region 1 (MWD/MTU) | MPC-24 Assembly Burnup for Region 2 (MWD/MTU) | MPC-24E/24EF Assembly Burnup for Region 1 (MWD/MTU) | MPC-24E/24EF Assembly Burnup for Region 2 (MWD/MTU) | MPC-32 Assembly Burnup for Region 1 (MWD/MTU) | MPC-32 Assembly Burnup for Region 2 (MWD/MTU) |
|---|---|---|---|---|---|---|
| ≥ 5 | 45,000 | 32,200 | 45,000 | 32,200 | 39,800 | 22,100 |
| ≥ 6 | - | 37,400 | - | 37,400 | 43,400 | 26,200 |
| ≥ 7 | - | 41,100 | - | 41,100 | 44,500 | 29,100 |
| ≥ 8 | - | 43,800 | - | 43,800 | 45,000 | 31,200 |
| ≥ 9 | - | 45,000 | - | 45,000 | - | 32,700 |
| ≥ 10 | - | - | - | - | - | 34,100 |
| ≥ 11 | - | - | - | - | - | 35,200 |
| ≥ 12 | - | - | - | - | - | 36,200 |
| ≥ 13 | - | - | - | - | - | 37,000 |
| ≥ 14 | - | - | - | - | - | 37,800 |
| ≥ 15 | - | - | - | - | - | 38,600 |
| ≥ 16 | - | - | - | - | - | 39,400 |
| ≥ 17 | - | - | - | - | - | 40,200 |
| ≥ 18 | - | - | - | - | - | 40,800 |
| ≥ 19 | - | - | - | - | - | 41,500 |
| ≥ 20 | - | - | - | - | - | 42,200 |

NOTE 1: Linear interpolation between points is permitted.

NOTE 2: These limits apply to INTACT FUEL ASSEMBLIES, DAMAGED FUEL ASSEMBLIES, and FUEL DEBRIS.

NOTE 3: Burnup for fuel assemblies with cladding made of ZIRLO is limited to 45,000 MWD/MTU or the value in this table, whichever is less.

TABLE 2.1-9

FUEL ASSEMBLY COOLING AND MAXIMUM DECAY HEAT
(REGIONALIZED FUEL LOADING)

| Post-Irradiation Cooling Time (years) | MPC-24 Assembly Decay Heat for Region 1 (Watts) | MPC-24 Assembly Decay Heat for Region 2 (Watts) | MPC-24E/24EF Assembly Decay Heat for Region 1 (Watts) | MPC-24E/24EF Assembly Decay Heat for Region 2 (Watts) | MPC-32 Assembly Decay Heat for Region 1 (Watts) | MPC-32 Assembly Decay Heat for Region 2 (Watts) |
|---|---|---|---|---|---|---|
| ≥ 5 | 1470 | 900 | 1540 | 900 | 1131 | 600 |
| ≥ 6 | 1470 | 900 | 1540 | 900 | 1072 | 600 |
| ≥ 7 | 1335 | 900 | 1395 | 900 | 993 | 600 |
| ≥ 8 | 1301 | 900 | 1360 | 900 | 978 | 600 |
| ≥ 9 | 1268 | 900 | 1325 | 900 | 964 | 600 |
| ≥ 10 | 1235 | 900 | 1290 | 900 | 950 | 600 |
| ≥ 11 | 1221 | 900 | 1275 | 900 | 943 | 600 |
| ≥ 12 | 1207 | 900 | 1260 | 900 | 937 | 600 |
| ≥ 13 | 1193 | 900 | 1245 | 900 | 931 | 600 |
| ≥ 14 | 1179 | 900 | 1230 | 900 | 924 | 600 |
| ≥ 15 | 1165 | 900 | 1215 | 900 | 918 | 600 |
| ≥ 16 | - | - | - | - | - | - |
| ≥ 17 | - | - | - | - | - | - |
| ≥ 18 | - | - | - | - | - | - |
| ≥ 19 | - | - | - | - | - | - |
| ≥ 20 | - | - | - | - | - | - |

<u>NOTE 1</u>: Linear interpolation between points is permitted.

<u>NOTE 2</u>: Includes all sources of decay heat (i.e., fuel and NONFUEL HARDWARE).

<u>NOTE 3</u>: These limits apply to INTACT FUEL ASSEMBLIES, DAMAGED FUEL ASSEMBLIES, and FUEL DEBRIS.

TABLE 2.1-10

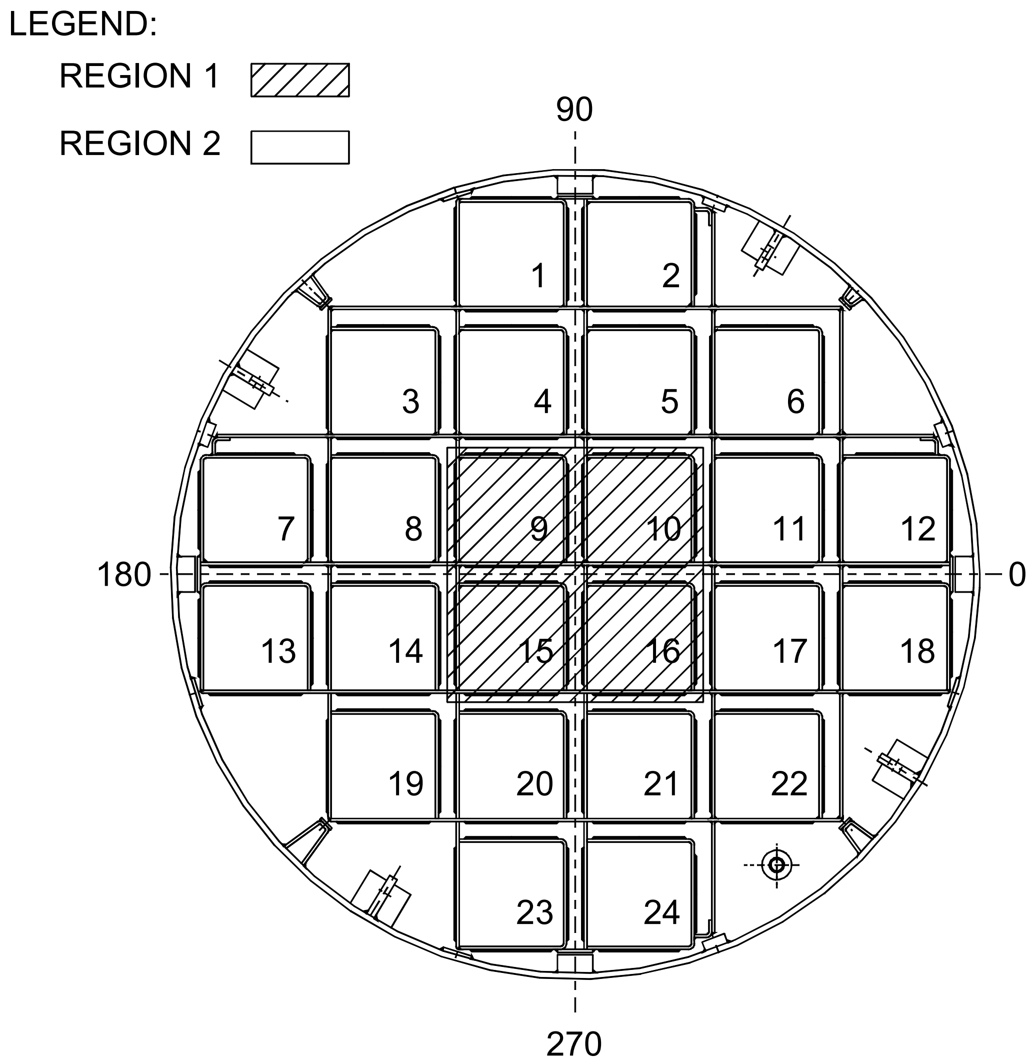
NONFUEL HARDWARE COOLING AND AVERAGE ACTIVATION

| Post-Irradiation Cooling Time (years) | BPRA and WABA Burnup (MWD/MTU) | TPD Burnup (MWD/MTU) | RCCA Burnup (MWD/MTU) |
|---|---|---|---|
| ≥3 | ≤ 20,000 | NA | NA |
| ≥4 | ≤ 25,000 | ≤ 20,000 | NA |
| ≥ 5 | ≤ 30,000 | ≤ 25,000 | ≤ 630,000 |
| ≥ 6 | ≤ 40,000 | ≤ 30,000 | - |
| ≥ 7 | ≤ 45,000 | ≤ 40,000 | - |
| ≥ 8 | ≤ 50,000 | ≤ 45,000 | - |
| ≥ 9 | ≤ 60,000 | ≤ 50,000 | - |
| ≥10 | - | ≤ 60,000 | - |
| ≥ 11 | - | ≤ 75,000 | - |
| ≥ 12 | - | ≤ 90,000 | - |
| ≥ 13 | - | ≤ 180,000 | - |
| ≥ 14 | - | ≤ 630,000 | - |

NOTE 1: Linear interpolation between points is permitted, except that TPD burnups > 180,000 MWD/MTU and ≤ 630,000 MWD/MTU must be cooled ≥ 14 years.

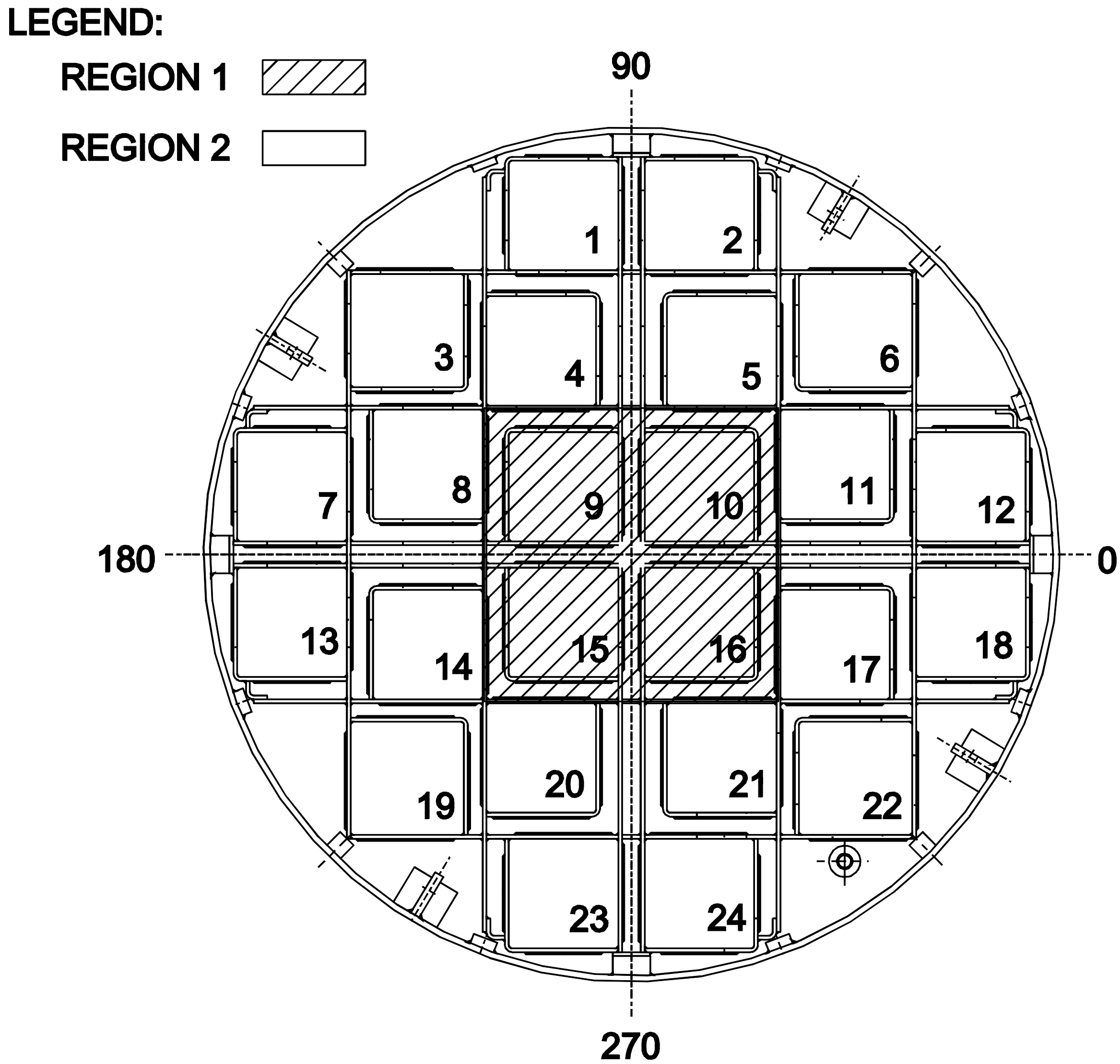
NOTE 2: Applicable to uniform loading and regionalized loading.

NOTE 3: NA means not authorized for loading.

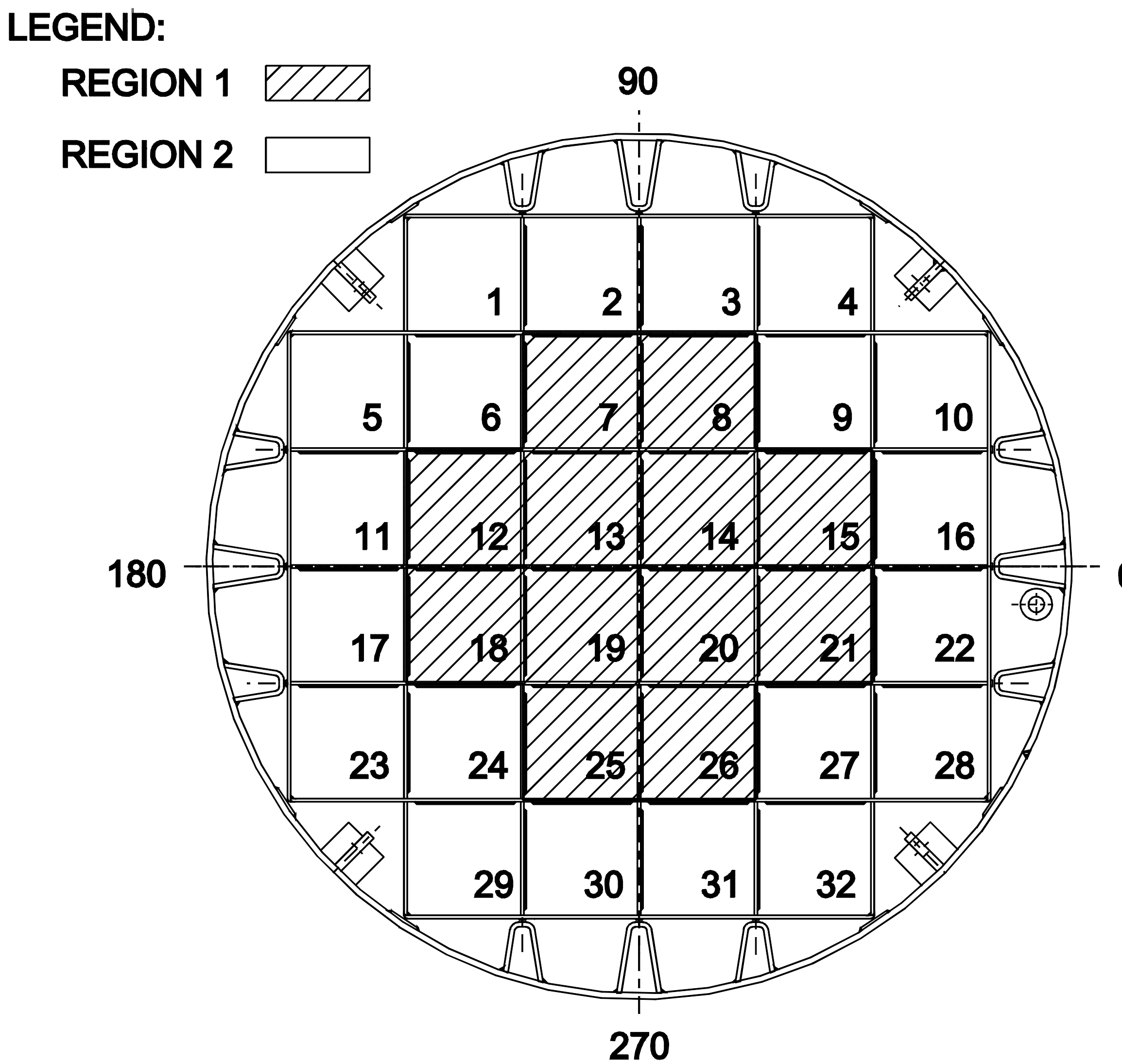



**DIABLO CANYON ISFSI**

**FIGURE 2.1-1**
**FUEL LOADING REGIONS**
**MPC-24**




| DIABLO CANYON ISFSI |
| --- |
| FIGURE 2.1-2<br>FUEL LOADING REGIONS<br>MPC-24E/24EF |




| DIABLO CANYON ISFSI |
|---|
| FIGURE 2.1-3<br>FUEL LOADING REGIONS<br>MPC-32 |

## 3.0 LIMITING CONDITION FOR OPERATION (LCO) APPLICABILITY

| | |
|---|---|
| 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.<br><br>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. |
| 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 or that are related to the unloading of an SFSC. |
| LCO 3.0.5 | Not applicable. |

## 3.0 SURVEILLANCE REQUIREMENT (SR) APPLICABILITY

| | |
|---|---|
| SR 3.0.1 | SRs shall be met during 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.<br><br>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.<br><br>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.<br><br>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 LCOs 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 or that are related to the unloading of an SFSC. |

# 3.1 SPENT FUEL STORAGE CASK (SFSC) INTEGRITY

## 3.1.1 MULTI-PURPOSE CANISTER (MPC)

LCO 3.1.1 The MPC shall be dry and helium filled.

APPLICABILITY: During TRANSPORT OPERATIONS and STORAGE OPERATIONS

ACTIONS

-----------------------------------------------------NOTE-----------------------------------------------------

Separate Condition entry is allowed for each MPC.

--------------------------------------------------------------------------------------------------------------

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. MPC cavity vacuum drying pressure or demoisturizer exit gas temperature limit not met. | A.1. Perform an engineering evaluation to determine the quantity of moisture left in the MPC. | 7 days |
| | <u>AND</u> | |
| | A.2 Develop and initiate corrective actions necessary to return the MPC to an analyzed condition. | 30 days |
| B. MPC helium backfill pressure limit not met. | B.1 Perform an engineering evaluation to determine the impact of helium pressure differential. | 72 hours |
| | <u>AND</u> | |
| | B.2 Develop and initiate corrective actions necessary to return the MPC to an analyzed condition. | 14 days |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| C. MPC helium leak rate limit not met. | C.1 | Perform an engineering evaluation to determine the impact of increased helium leak rate on heat removal capability and offsite dose. | 24 hours |
| | AND | | |
| | C.2 | Develop and initiate corrective actions necessary to return the MPC to an analyzed condition. | 7 days |
| D. Required Actions and associated Completion Times not met. | D.1 | Remove all fuel assemblies from the MPC. | 30 days |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.1.1 | Verify MPC cavity vacuum drying pressure is $\leq$ 3 torr for $\geq$ 30 min.<br>OR<br>While recirculating helium through the MPC cavity, verify that the gas temperature exiting the demoisturizer is $\leq$ 21°F for $\geq$ 30 min. | Once, prior to TRANSPORT OPERATIONS. |
| SR 3.1.1.2 | Verify MPC helium backfill pressure is $\geq$ 29.3 psig and $\leq$ 33.3 psig. | Once, prior to TRANSPORT OPERATIONS. |
| SR 3.1.1.3 | Verify that the total helium leak rate through the MPC lid confinement weld and the drain and vent port confinement welds is $\leq$ 5.0E-6 atm-cc/sec (He). | Once, prior to TRANSPORT OPERATIONS. |

## 3.1 SPENT FUEL STORAGE CASK (SFSC) INTEGRITY

### 3.1.2 Spent Fuel Storage Cask (SFSC) Heat Removal System

LCO 3.1.2 The SFSC Heat Removal System shall be operable.

APPLICABILITY: During STORAGE OPERATIONS

ACTIONS

-----------------------------------------------------NOTE-----------------------------------------------------

Separate Condition entry is allowed for each SFSC.

--------------------------------------------------------------------------------------------------------------

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. LCO not met. | A.1 Restore SFSC Heat Removal System to operable status. | 8 hours |
| | OR | |
| | A.2.1 Verify adequate heat removal to prevent exceeding short-term fuel temperature limit; | Immediately |
| | AND | |
| | A.2.2 Restore SFSC Heat Removal System to operable status. | 30 days |
| B. Required Actions and associated Completion Time not met. | B.1 Transfer the MPC into a TRANSFER CASK. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.2.1 | Verify all SFSC inlet and outlet air duct screens are free of blockage. | 24 hours |

3.1 SPENT FUEL STORAGE CASK (SFSC) INTEGRITY

3.1.3 Fuel Cool-Down

LCO 3.1.3 The MPC helium exit temperature shall be ≤ 200°F.

-----NOTE-----
The LCO is only applicable to wet UNLOADING OPERATIONS.
-----

APPLICABILITY: During UNLOADING OPERATIONS prior to re-flooding.

ACTIONS

-----NOTE-----
Separate Condition entry is allowed for each MPC.
-----

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. MPC helium gas exit temperature not within limit. | A.1 Establish MPC helium gas exit temperature within limit. | Prior to initiating MPC reflooding operations. |
| | <u>AND</u> | |
| | A.2 Ensure adequate heat transfer from the MPC to the environment | 22 hours |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.3.1 | Verify MPC helium gas exit temperature within limit. | Prior to MPC reflooding operations. |

## 3.1 SPENT FUEL STORAGE CASK (SFSC) INTEGRITY

### 3.1.4 Spent Fuel Storage Cask (SFSC) Time Limitation in Cask Transfer Facility (CTF)

LCO 3.1.4 The SFSC shall not be in the CTF for greater than 22 Hours

APPLICABILITY: During TRANSPORT OPERATIONS while the SFSC is in the CTF.

ACTIONS

-----------------------------------------------------NOTE-----------------------------------------------------

Separate Condition entry is allowed for each SFSC.

--------------------------------------------------------------------------------------------------------------

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. LCO not met. | A.1 Remove SFSC from CTF. | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.1.4.1 | Verify a SFSC in the CTF meets the time limitation. | 8 hours |

## 3.2 Cask Criticality Control Program

### 3.2.1 Dissolved Boron Concentration

LCO 3.2.1 The dissolved boron concentration in the water of the MPC cavity shall be as follows:

a. For all MPCs with one or more fuel assemblies having initial enrichment of ≤ 4.1 wt% $^{235}$U: ≥ 2000 ppmb.

b. For MPC24/24E/24EF with one or more fuel assemblies having initial enrichment of > 4.1 and ≤ 5.0 wt% $^{235}$U: ≥ 2000 ppmb.

c. For MPC 32 with one or more fuel assemblies having initial enrichment of > 4.1 and ≤ 5.0 wt% $^{235}$U: ≥ 2600 ppmb.

APPLICABILITY: During LOADING OPERATIONS and UNLOADING OPERATIONS with water and at least one fuel assembly in the MPC.

ACTIONS

-------------------------------------------------------NOTE-------------------------------------------------------
Separate Condition entry is allowed for each MPC.

---------------------------------------------------------------------------------------------------------------------

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. Dissolved boron concentration not met. | A.1 Suspend LOADING OPERATIONS or UNLOADING OPERATIONS | Immediately |
| | AND | |
| | A.2 Suspend positive reactivity additions | Immediately |
| | AND | |
| | A.3 Initiate action to restore boron concentration to within limits | Immediately |

SURVEILLANCE REQUIREMENTS

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.2.1.1 | Verify the dissolved boron concentration is met using two independent measurements. | Within 8 hours prior to commencing LOADING OPERATIONS<br><br>AND<br><br>Every 48 hours thereafter while the MPC is in the spent fuel pool or while water is in the MPC. |
| SR 3.2.1.2 | Verify the dissolved boron concentration is met using two independent measurements. | Within 8 hours prior to commencing UNLOADING OPERATIONS<br><br>AND<br><br>Every 48 hours thereafter while the MPC is in the spent fuel pool or while water is in the MPC. |

# 4.0 DESIGN FEATURES

## 4.1 Design Features Significant to Safety

### 4.1.1 Criticality Control

a. MULTI-PURPOSE CANISTER (MPC) MPC-24

1. Flux trap size: $\geq$ 1.09 in.

2. $^{10}B$ loading in the Boral neutron absorbers: $\geq 0.0267\ g/cm^2$

b MPC-24E and MPC-24EF

1. Flux trap size:

    - Cells 3, 6, 19, and 22: $\geq$ 0.776 in.

    - All Other Cells: $\geq$ 1.076 in.

2. $^{10}B$ loading in the Boral neutron absorbers: $\geq 0.0372\ g/cm^2$

c. MPC-32

1. Fuel cell pitch: $\geq$ 9.158 in.

2. $^{10}B$ loading in the Boral neutron absorbers: $\geq 0.0372\ g/cm^2$

## 4.2 Codes and Standards

The following provides information on the governing codes for the confinement boundary (important to Safety) design:

| MPC (Shell and Head) | Applicable Codes | Editions/Years |
|---|---|---|
| Material Procurement | ASME III, NB-2000 | ASME Code, 1995 Edition. 1997 Addenda |
| Design | ASME III, NB-3200 | ASME Code, 1995 Edition. 1997 Addenda |
| Fabrication | ASME III, NB-4000 | ASME Code, 1995 Edition. 1997 Addenda |
| Examination | ASME III, NB-5000 | ASME Code, 1995 Edition. 1997 Addenda |

Any specific alternatives to these codes and standards, and the codes and standards for other components followed for the Diablo Canyon ISFSI storage system, are provided in the Diablo Canyon ISFSI Safety Analysis Report (SAR).

(continued)

4.0 DESIGN FEATURES (continued)

4.2.1 Alternatives to Design Codes, Standards, and Criteria

Proposed construction/fabrication alternatives to the above MPC design codes and standards, including alternatives in SAR Table 3.4-6, may be used when authorized by the Director of the Office of Nuclear Material Safety and Safeguards or designee. The licensee should demonstrate that:

1. The proposed alternatives would provide an acceptable level of quality and safety, or
2. Compliance with the specified requirements of ASME Code Section III, 1995 Edition with Addenda through 1997, would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Requests for relief in accordance with this section shall be submitted in accordance with 10 CFR 72.4.

(continued)

4.0 DESIGN FEATURES (continued)

4.3 Cask Handling/Cask Transfer Facility

4.3.1 Cask Transporter

A site-specific cask transporter is used to transport the TRANSFER CASK between the power plant and the CASK TRANSFER FACILITY (CTF) and the SPENT FUEL STORAGE CASK (SFSC) between the CTF and ISFSI pad. The requirements for the cask transporter are as follows:

a. TRANSPORT OPERATIONS shall be conducted using the cask transporter.

b. The cask transporter fuel tank shall not contain > 50 gallons of diesel fuel at any time.

c. The cask transporter shall be designed, fabricated, inspected, maintained, operated, and tested in accordance with the applicable guidelines of NUREG-0612.

d. The cask transporter lifting towers shall have redundant drop protection features.

e. Lifting of a SFSC, loaded TRANSFER CASK, or loaded MPC outside of structures governed by 10 CFR 50 shall be performed with lifting devices that are designed, fabricated, inspected, maintained, operated and tested in accordance with the applicable guidelines of NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants."

4.3.2 Storage Capacity

The Diablo Canyon ISFSI can accommodate up to 4,400 spent fuel assemblies and other NONFUEL HARDWARE. The ISFSI storage capacity will accommodate up to 140 SFSCs (138 plus 2 spare locations).

4.3.3 SFSC Load Handling Equipment

Lifting of a SFSC outside of structures governed by 10 CFR 50 shall be performed with load handling equipment that is designed, fabricated, inspected, maintained, operated and tested in accordance with the applicable guidelines of NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants" as clarified by Section 4.3.4 below. The CTF requirements in Section 4.3.4 below do not apply to heavy loads governed by the regulations of 10 CFR 50.

4.3.4 CTF Structure Requirements

a. Permanent Load Handling Equipment

   1. The weldment structure of the CTF shall be designed to comply with the stress limits of ASME Code, Section III, Subsection NF, Class 3 for linear structures. All compression-loaded members shall satisfy the buckling criteria of ASME Section III, Subsection NF. The applicable loads, load combinations, and associated service condition definitions are provided in Diablo Canyon ISFSI SAR Section 4.4.5.

   2. The reinforced concrete structure of the CTF shall be designed in accordance with ACI-349-1997, as clarified in Diablo Canyon ISFSI SAR Section 4.2.1.2.

(continued)

4.0 DESIGN FEATURES (continued)

b. Mobile Load Handling Equipment

Mobile load handling equipment used in lieu of permanent load handling equipment, shall meet the guidelines of NUREG-0612, Section 5.1, with the following clarifications:

1. Mobile lifting devices shall have a minimum safety factor of two over the allowable load table for the lifting device in accordance with the guidance of NUREG-0612, Section 5.1.6(1)(a) and shall be capable of stopping and holding the load during a Design Basis Earthquake (DBE) event.
2. Mobile lifting devices shall conform to the requirements of ASME B30.5, “Mobile and Locomotive Cranes,” in lieu of the requirements of ASME B30.2, “Overhead and Gantry Cranes.”
3. Mobile cranes are not required to meet the guidance of NUREG-0612, Section 5.1.6(2) for new cranes.
4. Horizontal movements of the TRANSFER CASK and MPC using a mobile crane are prohibited.

# 5.0 ADMINISTRATIVE CONTROLS

## 5.1 Administrative Programs

The following programs shall be established, implemented, and maintained:

### 5.1.1 Technical Specifications (TS) Bases Control Program

This program provides a means for processing changes to the Bases of these TS.

a. Changes to the TS Bases shall be made under appropriate administrative controls and reviews.

b. Changes to the TS Bases may be made without prior NRC approval in accordance with the criteria in 10 CFR 72.48.

c. The TS Bases Control Program shall contain provisions to ensure that the TS Bases are maintained consistent with the Diablo Canyon ISFSI SAR.

d. Proposed changes that do not meet the criteria of 5.1.1.b above shall be reviewed and approved by the NRC prior to implementation. Changes to the TS Bases implemented without prior NRC approval shall be provided to the NRC on a frequency consistent with 10 CFR 72.48 (d) (2).

### 5.1.2 Radioactive Effluent Control Program

This program is established and maintained to:

a. Implement the requirements of 10 CFR 72.44 (d) or 72.126, as appropriate

b. Provide limits on surface contamination of the TRANSFER CASK and verification of meeting those limits prior to removal of a loaded TRANSFER CASK from the fuel handling building/auxiliary building.

c. Provide MPC leakage rate limits and verification of meeting those limits prior to removal of a loaded TRANSFER CASK from the fuel handling building/auxiliary building.

d. Provide an effluent monitoring program, as appropriate, if the surface contamination limits are greater than the values specified in Regulatory Guide 1.86; or if the leakage rate limits are greater then the values specified as “Leaktight” in ANSI N14.5 – 1997 “Leakage Tests on Packages for Shipment.”

(continued)

5.0 ADMINISTRATIVE CONTROLS (continued)

5.1.3 MPC and SFSC Loading, Unloading, and Preparation Program

This program shall be established and maintained to implement Diablo Canyon ISFSI SAR Section 10.2 requirements for loading fuel and components into MPCs, unloading fuel and components from MPCs, and preparing the MPCs for storage in the SFSCs. The requirements of the program for loading and preparing the MPC shall be complete prior to removing the MPC from the fuel handling building/auxiliary building. The program provides for evaluation and control of the following requirements during the applicable operation:

a. Verify that no transfer cask handling operations are allowed at environmental temperatures below -18 °C [0 °F].

b. Verify the maintenance of water in the annular gap between the loaded MPC and TRANSFER CASK during MPC moisture removal operations (loading) or MPC reflooding operations (unloading).

c. The water temperature of a water-filled or partially filled loaded MPC shall be shown by analysis to be less than boiling at all times.

d. Verify that the drying times and pressures assure that fuel cladding temperature limit is not violated and the MPC is adequately dry.

e. Verify that the inerting backfill pressure and purity assure adequate heat transfer and corrosion control.

f. Verify that leak testing assures adequate MPC integrity and consistency with offsite dose analysis.

g. Verify surface dose rates on the TRANSFER CASK are adequate to assure proper loading and consistency with the offsite dose analysis.

h. Verify surface dose rates on the SFSCs are adequate to assure proper storage and consistency with the offsite dose analysis.

i. During MPC re-flooding, verify the helium exit temperature is such that water quenching or flashing does not occur.

This program will control limits, surveillances, compensatory measures and appropriate completion times to assure the integrity of the fuel cladding at all times in preparation of and during LOADING, UNLOADING or TRANSPORT OPERATIONS, as applicable.

(continued)

5.0 ADMINISTRATIVE CONTROLS (continued)

5.1.4 ISFSI Operations Program

This program will implement the Diablo Canyon ISFSI SAR requirements for ISFSI operations. It will include criteria to be verified and controlled:

a) SFSC cask storage location.

b) Design features listed in Section 4.0 and design basis ISFSI pad parameters consistent with the Diablo Canyon ISFSI SAR analysis.

c) Condition of the ISFSI Pad anchor bolt surface coatings exposed directly to the elements.

5.1.5 Cask Transportation Evaluation Program

This program will evaluate and control the transportation of loaded MPCs between the DCPP fuel handling building/auxiliary building, the CTF and the ISFSI storage pads. Included in this program will be pre-transport evaluation and control during transportation of the following:

- Transportation route road surface conditions
- Onsite hazards along the transportation route
- Security
- Transporter control functions and operability
- CTF equipment operability
- SFSC auxiliary cooling capability availability