Diablo Canyon ISFSI Amendment 5 Technical Specification Page Changes

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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.
MINIMUM ENRICHMENT	MINIMUM ENRICHMENT is the minimum assembly average enrichment. Natural uranium blankets are not considered in determining minimum enrichment.
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 cluster control assemblies (RCCAs), wet annular burnable absorbers (WABAs), neutron source assemblies (NSAs), instrument tube tie rods (ITTRs), and components of these devices such as individual rods.
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).

(continued)

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 Fuel Loading

Fuel assemblies used in uniform 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.

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.

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.

2.0 APPROVED CONTENTS (continued)

2.3 Alternate MPC-32 Fuel Selection Criteria

The maximum allowable fuel assembly average burnup for a given MINIMUM ENRICHMENT is calculated as described below for a minimum cooling time of 5 years using the maximum permissible decay heat determined in Tables 2.1-7 or 2.1-9 as appropriate for uniform and regionalized loadings. Different fuel assembly average burnup limits may be calculated for different minimum enrichments (by individual fuel assembly) for use in choosing the fuel assemblies to be loaded into a given MPC.

a. Choose a fuel assembly minimum enrichment E235.

b. Calculate the maximum allowable fuel assembly average burnup for a minimum cooling time of 5 years using the following equation below:

$$Bu = (A \times q) + (B \times q^2) + (C \times q^3) + [D \times (E_{235})^2] + (E \times q \times E_{235}) + (F \times q^2 \times E_{235}) + G$$

Where:

Bu = Maximum allowable average burnup per fuel assembly (MWD/MTU)

q = Maximum allowable decay heat per storage location, in kilowatts, determined from Table 2.1-7 or 2.1-9 (e.g. 898 Watts, use 0.898)

E_{235} = Minimum fuel assembly average enrichment (wt% ^{235}U) (e.g., for 4.05 wt%, use 4.05)

A through G = Coefficients from Table 2.3-1.

c. Calculated burnup limits shall be rounded down to the nearest integer.

d. Calculated burnup limits greater than 68,200 MWD/MTU must be reduced to be equal to this value.

e. Linear interpolation of calculated burnups between cooling times for a given fuel assembly maximum decay heat and minimum enrichment is permitted. For example, the allowable burnup for a cooling time of 5.5 years may be interpolated between those burnups calculated for 5 year and 6 years.

f. Each ZR-clad fuel assembly to be stored must have a MINIMUM ENRICHMENT greater than or equal to the value used in Step 2.3.a.

g. When complying with the maximum fuel storage location decay heat limits, users must account for the decay heat from both the fuel assembly and any NON-FUEL HARDWARE, as applicable for the particular fuel storage location, to ensure the decay heat emitted by all contents in a storage location does not exceed the limit.

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) (Note 2)
≥ 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

NOTE 1: Linear interpolation between points is permitted.
NOTE 2: Burnup limits for fuel assemblies in an MPC-32 may alternatively be calculated using Section 2.3.

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	1131	600
≥ 7	1335	900	1395	900	1131	600
≥ 8	1301	900	1360	900	1131	600
≥ 9	1268	900	1325	900	1131	600
≥ 10	1235	900	1290	900	1131	600
≥ 11	1221	900	1275	900	1131	600
≥ 12	1207	900	1260	900	1131	600
≥ 13	1193	900	1245	900	1131	600
≥ 14	1179	900	1230	900	1131	600
≥ 15	1165	900	1215	900	1131	600

NOTE 1: Linear interpolation between points is permitted.

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

NOTE 3: 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 and NSA Burnup (MWD/MTU)	RCCA Burnup (MWD/MTU)
≥3	≤ 20,000	Not Authorized	Not Authorized
≥4	≤ 25,000	≤ 20,000	Not Authorized
≥ 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 and NSA 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: Deleted

NOTE 4: Non-fuel hardware burnup and cooling times are not applicable to ITTRs since they are installed post-irradiation.

NOTE 5: Only one NSA is authorized for loading in any MPC.

3.1 SPENT FUEL STORAGE CASK (SFSC) INTEGRITY

3.1.4 Supplemental Cooling System

LCO 3.1.4 The Supplemental Cooling System (SCS) shall be operable.

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

Upon reaching steady state operation, the SCS may be temporarily disabled for a short duration (≤ 7 hours) to facilitate necessary operational evolutions, such as movement of the TRANSFER CASK through a doorway, or other similar operations.

APPLICABILITY: When a loaded MPC-32, containing one or more fuel assemblies with an average burnup of > 45,000 MWD/MTU, is in the TRANSFER CASK, and:

a.1 Bulk water has been removed from the MPC.

AND

a.2 Forced helium dehydration has been secured for greater than 4 hours.

AND

a.3 The TRANSFER CASK containing the MPC has temporary shielding installed during cask processing operations within the fuel handling building.

OR

b.1 The MPC to be unloaded has been transferred into the TRANSFER CASK for greater than 4 hours.

AND

b.2 The MPC was originally loaded with a helium backfill pressure of ≥29.3 psig and ≤33.3 psig at a reference temperature of 70° F.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Supplemental Cooling System inoperable	A.1 Restore Supplemental Cooling System to operable status.	7 days
B. Required Action A.1 and associated Completion Time not met.	B.1 Remove all fuel assemblies from the MPC.	30 days

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.4.1	Verify Supplemental Cooling System is operable	2 hours