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 minimum cooling times between 5 and 20 years using the maximum permissible decay heat determined in Tables 2.1-7 and 2.1-9. 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 E_{235}.

b. Calculate the maximum allowable fuel assembly average burnup for a minimum cooling time between 5 and 20 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 (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 2.1-9

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
≥ 16	-	-	-	-	-	-
≥ 17	-	-	-	-	-	-
≥ 18	-	-	-	-	-	-
≥ 19	-	-	-	-	-	-
≥ 20	-	-	-	-	-	-

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 2.1-8

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) Note 3	MPC-32 Assembly Burnup for Region 2 (MWD/MTU) Note 3
≥ 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 limits for fuel assemblies in an MPC-32 may alternatively be calculated using Section 2.3.

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) [BU ≤45,000 MWd/MTU]	MPC-32 Assembly Decay Heat (INTACT FUEL ASSEMBLIES) (Watts) [BU >45,000 MWd/MTU]
≥ 5	1157	1173	1115	898	898
≥ 6	1123	1138	1081	898	898
≥ 7	1030	1043	991	898	898
≥ 8	1020	1033	981	898	898
≥ 9	1010	1023	972	898	898
≥ 10	1000	1012	962	898	898
≥ 11	996	1008	958	898	898
≥ 12	992	1004	954	898	898
≥ 13	987	999	949	898	898
≥ 14	983	995	945	898	898
≥ 15	979	991	941	898	898

NOTE 1: Linear interpolation between points is permitted.

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

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. MPC helium leak rate limit for vent and drain port cover plate welds not met.	C.1 Perform an engineering evaluation to determine the impact of increased helium leak rate on heat removal capability and offsite dose. <u>AND</u> C.2 Develop and initiate corrective actions necessary to return the MPC to an analyzed condition.	24 hours 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	While recirculating helium through the MPC cavity, verify that the gas temperature exiting the demoisturizer is ≤ 21°F for ≥ 30 min.	Once, prior to TRANSPORT OPERATIONS.
	• SR 3.1.1.2 Verify MPC helium backfill pressure is ≥ 29.3 psig and ≤ 33.3 psig at a reference temperature of 70° F for an MPC containing only low burnup fuel. • ≥ 29.3 psig and ≤ 33.3 psig at a reference temperature of 70 F for an MPC-32 originally loaded uniformly with high burnup fuel with a total heat load ≤ 24 kW. • ≥ 34 psig and ≤ 40 psig at a reference temperature of 70 F for an MPC-32 containing high burnup fuel loaded up to the maximum regional or uniform total heat load..	Once, prior to TRANSPORT OPERATIONS.
SR 3.1.1.3	Verify that the total helium leak rate through the MPC vent and drain port confinement welds meets the leaktight criteria of ANSI N14.5-1997.	Once, prior to TRANSPORT OPERATIONS.

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^{o} 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

4.0 DESIGN FEATURES (continued)

4.1.3 Design Features Important to Thermal Analysis

a. A maximum average yearly temperature of 65° F is the basis for a loaded overpack in the cask transfer facility, or storage on the ISFSI pad.

b. A maximum temperature of 100° F, averaged over a 3-day period, is the basis for transfer activities in the transfer cask.

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).

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.