

NPF-10/15-449

ATTACHMENT "A"

CURRENT TECHNICAL SPECIFICATION IMPROVEMENT PROGRAM
(PCN 299) TECHNICAL SPECIFICATIONS

UNIT 2

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3.7 PLANT SYSTEMS

3.7.18 Spent Fuel Assembly Storage

LCO 3.7.18 The combination of initial enrichment and burnup of each spent fuel assembly stored in Region II shall be within the acceptable burnup domain of Figure 3.7.18-1 and Figure 3.7.18-2 or in accordance with Specification 4.3.1.1.

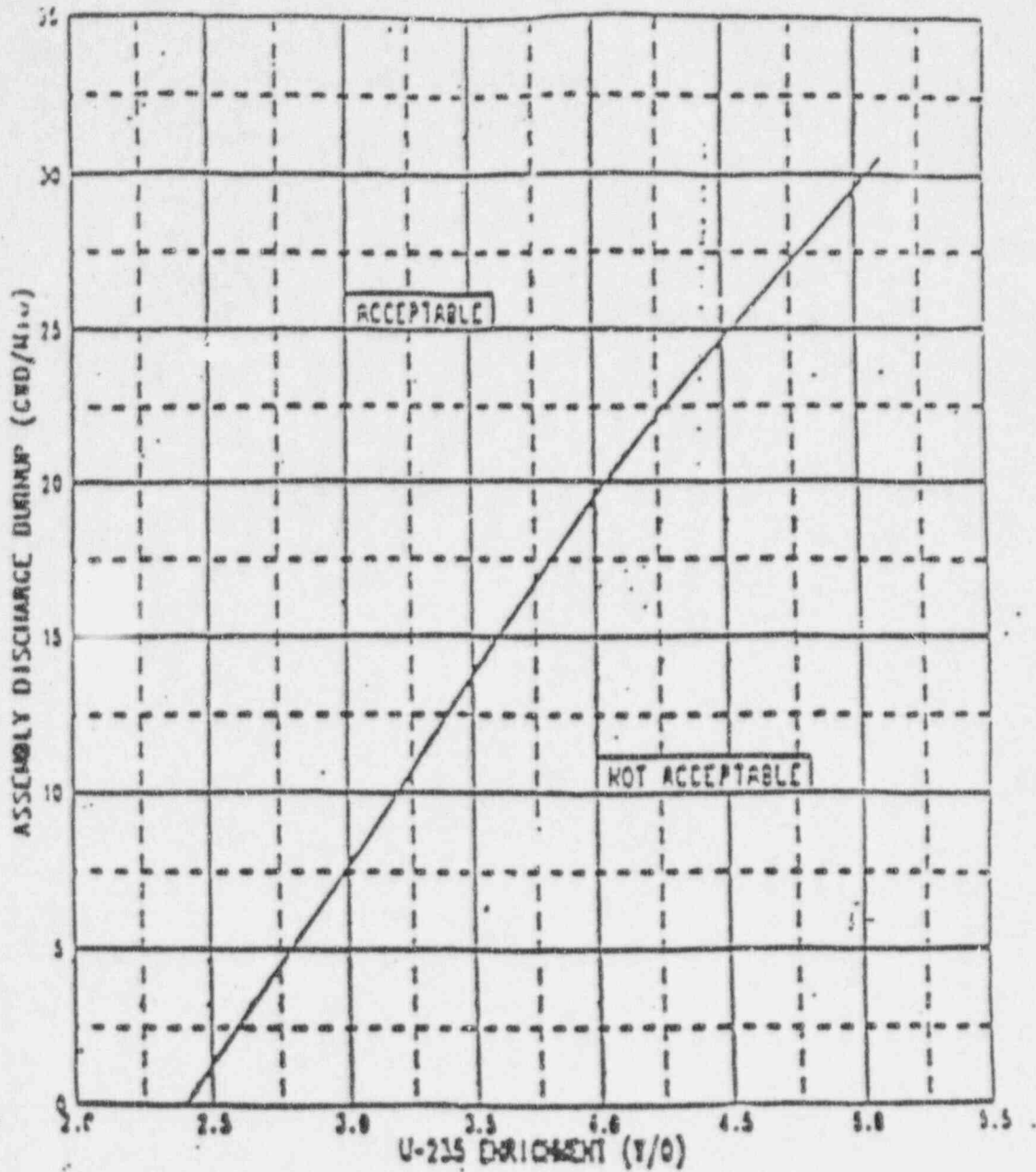
APPLICABILITY: Whenever any fuel assembly is stored in Region II of the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of the LCO not met.	A.1 -----NOTE----- LCO 3.0.3 is not applicable. ----- Initiate action to move the noncomplying fuel assembly from Region II.	Immediately

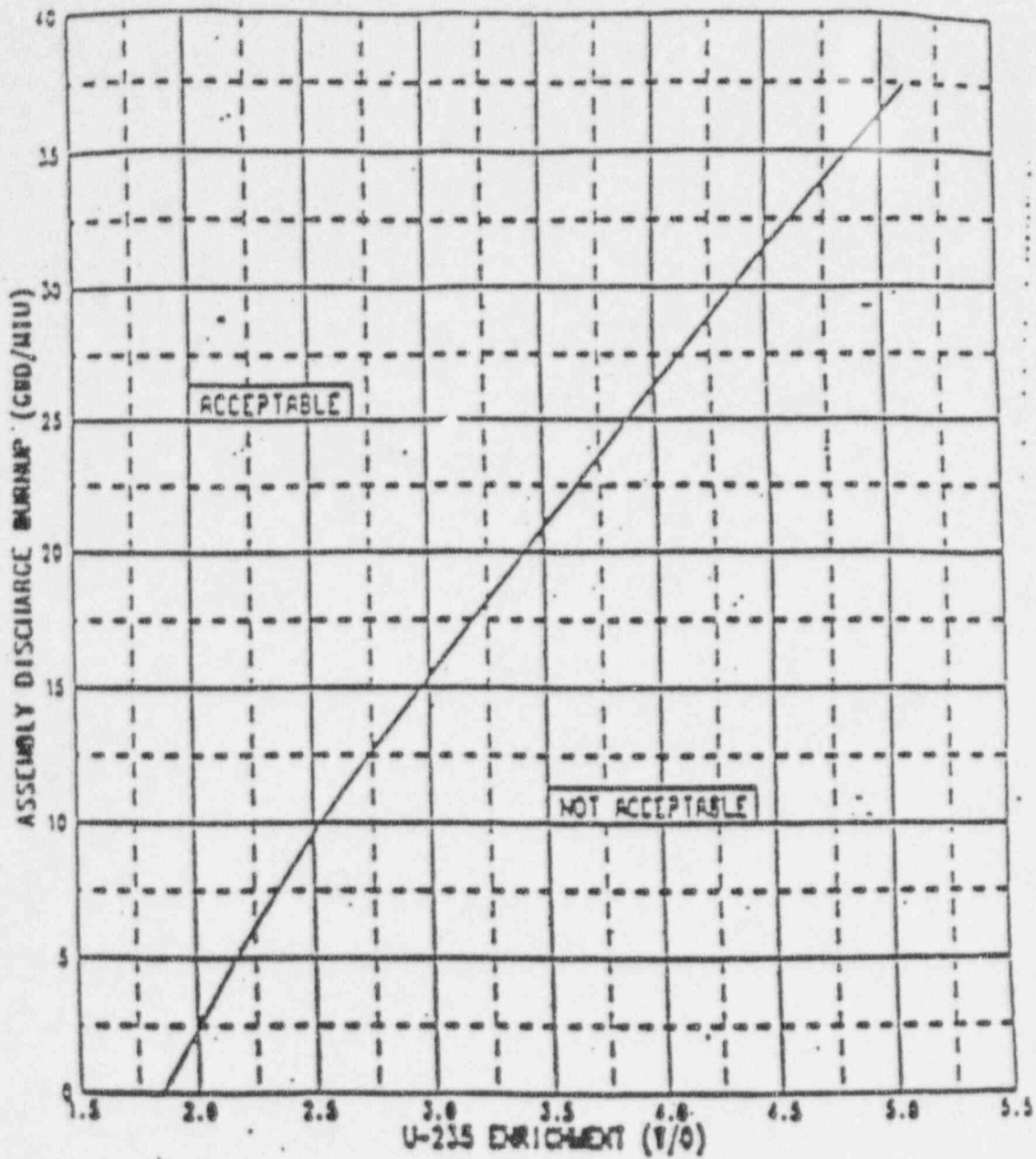
SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.18.1 Verify by administrative means the initial enrichment and burnup of the fuel assembly is in accordance with Figure 3.7.18-1 and Figure 3.7.18-2 or Specification 4.3.1.1.	Prior to storing the fuel assembly in Region II



UNIT 1 FUEL MINIMUM BURNUP vs INITIAL ENRICHMENT FOR REGION II RACKS

FIGURE 3.7.18-1



UNITS 2 AND 3 FUEL MINIMUM BURNUP vs INITIAL ENRICHMENT FOR REGION II RACKS

FIGURE 3.7.18-2

3.7 PLANT SYSTEMS

3.7.19 Secondary Specific Activity

LC0 3.7.19 The specific activity of the secondary coolant shall be $\leq 0.10 \mu\text{Ci/gm}$ DOSE EQUIVALENT I-131.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Specific activity not within limit.	A.1 Be in MODE 3.	6 hours
	<u>AND</u> A.2 Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.19.1 Verify the specific activity of the secondary coolant is within limit.	31 days

4.0 DESIGN FEATURES (continued)

4.3 Fuel Storage

4.3.1 Criticality

4.3.1.1 The spent fuel storage racks are designed and shall be maintained with:

- a. Fuel assemblies having a maximum U-235 enrichment of 4.1 weight percent;
- b. $K_{eff} \leq 0.95$ if fully flooded with unborated water, which includes an allowance for uncertainties as described in Section 9.1 of the UFSAR;
- c. A nominal 8.85 inch center to center distance between fuel assemblies placed in Region II;
- d. A nominal 10.40 inch center to center distance between fuel assemblies placed in Region I;
- e. Fuel assemblies may be stored in Region I with no restrictions;
- f. Fuel assemblies with a burnup in the "acceptable range" of Figure 3.7.18-1 and Figure 3.7.18-2 are allowed unrestricted storage in Region II; and
- g. Fuel assemblies with a burnup in the "unacceptable range" of Figure 3.7.18-1 and Figure 3.7.18-2 will be stored in compliance with the Licensee Controlled Specification.

4.3.1.2 The new fuel storage racks are designed and shall be maintained with:

- a. Fuel assemblies having a maximum U-235 enrichment of 4.1 weight percent;
- b. $K_{eff} \leq 0.95$ if fully flooded with unborated water, which includes an allowance for uncertainties as described in Section 9.1 of the UFSAR;
- c. $K_{eff} \leq 0.98$ if moderated by aqueous foam, which includes an allowance for uncertainties as described in Section 9.1 of the UFSAR; and

(continued)

4.0 DESIGN FEATURES

4.3 Fuel Storage (continued)

- d. A minimum 29 inch center to center distance between fuel assemblies placed in the storage racks.

4.3.2 Drainage

The spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below Technical Specification 3.7.16 value (23 feet above the top of irradiated fuel assemblies seated in the storage racks).

4.3.3 Capacity

The spent fuel storage pool is designed and shall be maintained with a storage capacity limited to no more than 1542 fuel assemblies.

ATTACHMENT "B"

CURRENT TECHNICAL SPECIFICATION IMPROVEMENT PROGRAM
(PCN 299) TECHNICAL SPECIFICATIONS

UNIT 3

3.7 PLANT SYSTEMS

3.7.18 Spent Fuel Assembly Storage

LCO 3.7.18 The combination of initial enrichment and burnup of each spent fuel assembly stored in Region II shall be within the acceptable burnup domain of Figure 3.7.18-1 and Figure 3.7.18-2 or in accordance with Specification 4.3.1.1.

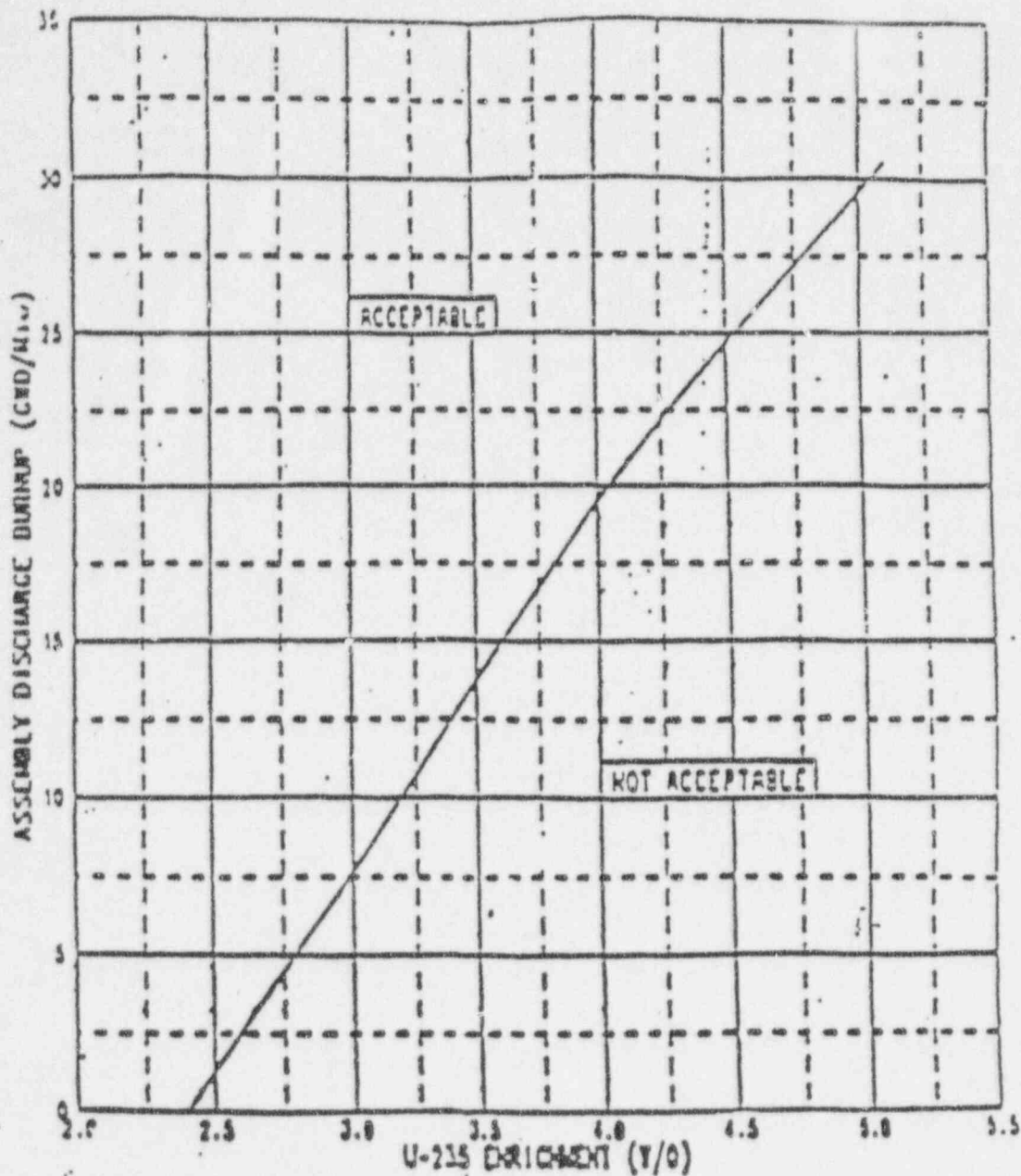
APPLICABILITY: Whenever any fuel assembly is stored in Region II of the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of the LCO not met.	<p>A.1 -----NOTE----- LCO 3.0.3 is not applicable. -----</p> <p>Initiate action to move the noncomplying fuel assembly from Region II.</p>	Immediately

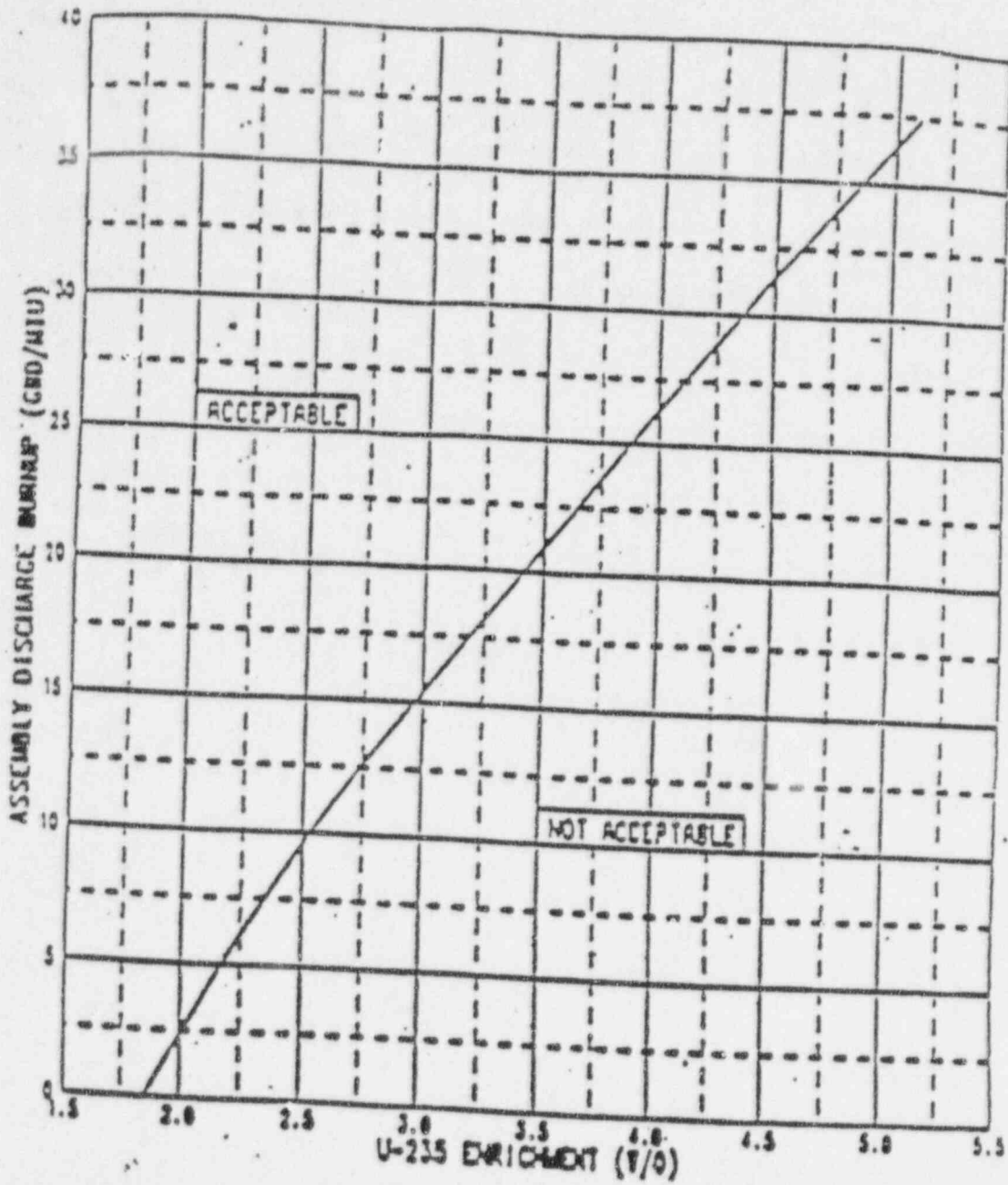
SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.18.1 Verify by administrative means the initial enrichment and burnup of the fuel assembly is in accordance with Figure 3.7.18-1 and Figure 3.7.18-2 or Specification 4.3.1.1.	Prior to storing the fuel assembly in Region II



UNIT 1 FUEL MINIMUM BURNUP vs INITIAL ENRICHMENT FOR REGION II RACKS

FIGURE 3.7.18-1



UNITS 2 AND 3 FUEL MINIMUM BURNUP vs INITIAL ENRICHMENT FOR REGION II RACKS

FIGURE 3.7.18-2

3.7 PLANT SYSTEMS

3.7.19 Secondary Specific Activity

LCO 3.7.19 The specific activity of the secondary coolant shall be $\leq 0.10 \mu\text{Ci/gm}$ DOSE EQUIVALENT I-131.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Specific activity not within limit.	A.1 Be in MODE 3.	6 hours
	<u>AND</u> A.2 Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.19.1 Verify the specific activity of the secondary coolant is within limit.	31 days

4.0 DESIGN FEATURES

4.2 Fuel Storage

4.3.1 Criticality

- 4.3.1.1 The spent fuel storage racks are designed and shall be maintained with:
- a. Fuel assemblies having a maximum U-235 enrichment of 4.1 weight percent;
 - b. $K_{eff} \leq 0.95$ if fully flooded with unborated water, which includes an allowance for uncertainties as described in Section 9.1 of the UFSAR;
 - c. A nominal 8.85 inch center to center distance between fuel assemblies placed in Region II;
 - d. A nominal 10.40 inch center to center distance between fuel assemblies placed in Region I;
 - e. Fuel assemblies may be stored in Region I with no restrictions;
 - f. Fuel assemblies with a burnup in the "acceptable range" of Figure 3.7.18-1 and Figure 3.7.18-2 are allowed unrestricted storage in Region II; and
 - g. Fuel assemblies with a burnup in the "unacceptable range" of Figure 3.7.18-1 and Figure 3.7.18-2 will be stored in compliance with the Licensee Controlled Specification.
- 4.3.1.2 The new fuel storage racks are designed and shall be maintained with:
- a. Fuel assemblies having a maximum U-235 enrichment of 4.1 weight percent;
 - b. $K_{eff} \leq 0.95$ if fully flooded with unborated water, which includes an allowance for uncertainties as described in Section 9.1 of the UFSAR;
 - c. $K_{eff} \leq 0.98$ if moderated by aqueous foam, which includes an allowance for uncertainties as described in Section 9.1 of the UFSAR; and

(continued)

4.0 DESIGN FEATURES

4.3 Fuel Storage (continued)

- d. A minimum 29 inch center to center distance between fuel assemblies placed in the storage racks.

4.3.2 Drainage

The spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below Technical Specification 3.7.16 value (23 feet above the top of irradiated fuel assemblies seated in the storage racks).

4.3.3 Capacity

The spent fuel storage pool is designed and shall be maintained with a storage capacity limited to no more than 1542 fuel assemblies.

ATTACHMENT "C"

REVISED TECHNICAL SPECIFICATION IMPROVEMENT PROGRAM
(PCN 299) TECHNICAL SPECIFICATIONS

UNIT 2

3.7 PLANT SYSTEMS

3.7.18 Spent Fuel Assembly Storage

LCO 3.7.18 The combination of initial enrichment and burnup of each SONGS 2 and 3 spent fuel assembly stored in Region II shall be within the acceptable burnup domain of Figure 3.7.18-1 and or Figure 3.7.18-2, or the fuel assembly shall be stored in accordance with Licensee Controlled Specification ~~4.3.1.1~~ 4.0.100.

The burnup of each SONGS 1 uranium dioxide spent fuel assembly stored in Region II shall be greater than or equal to 18.0 GWD/T for interior locations or 5.5 GWD/T for peripheral locations, or the fuel assembly shall be stored in accordance with Licensee Controlled Specification 4.0.100.

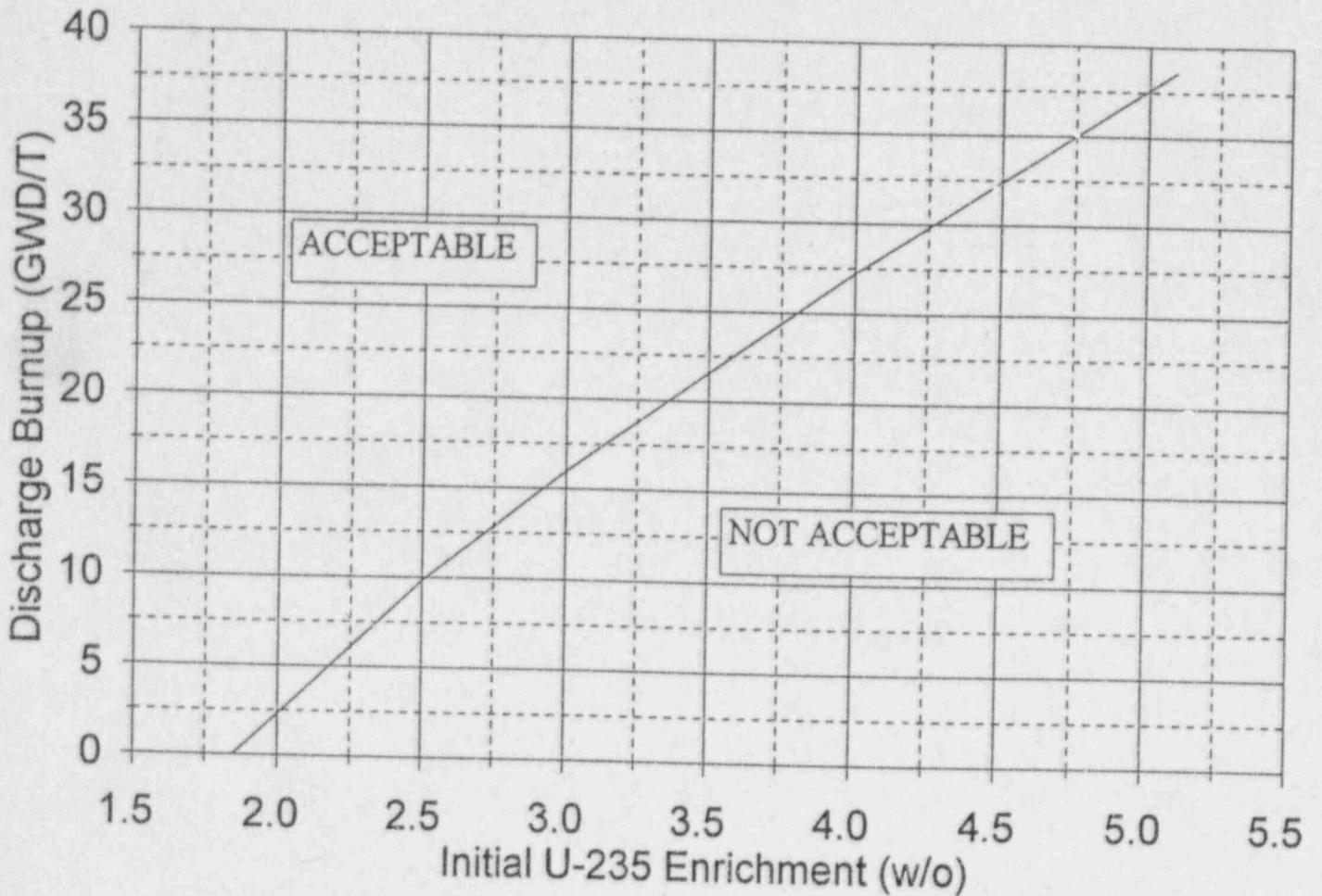
APPLICABILITY: Whenever any fuel assembly is stored in Region II of the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of the LCO not met.	A.1 -----NOTE----- LCO 3.0.3 is not applicable. ----- Initiate action to move the noncomplying fuel assembly from Region II.	Immediately

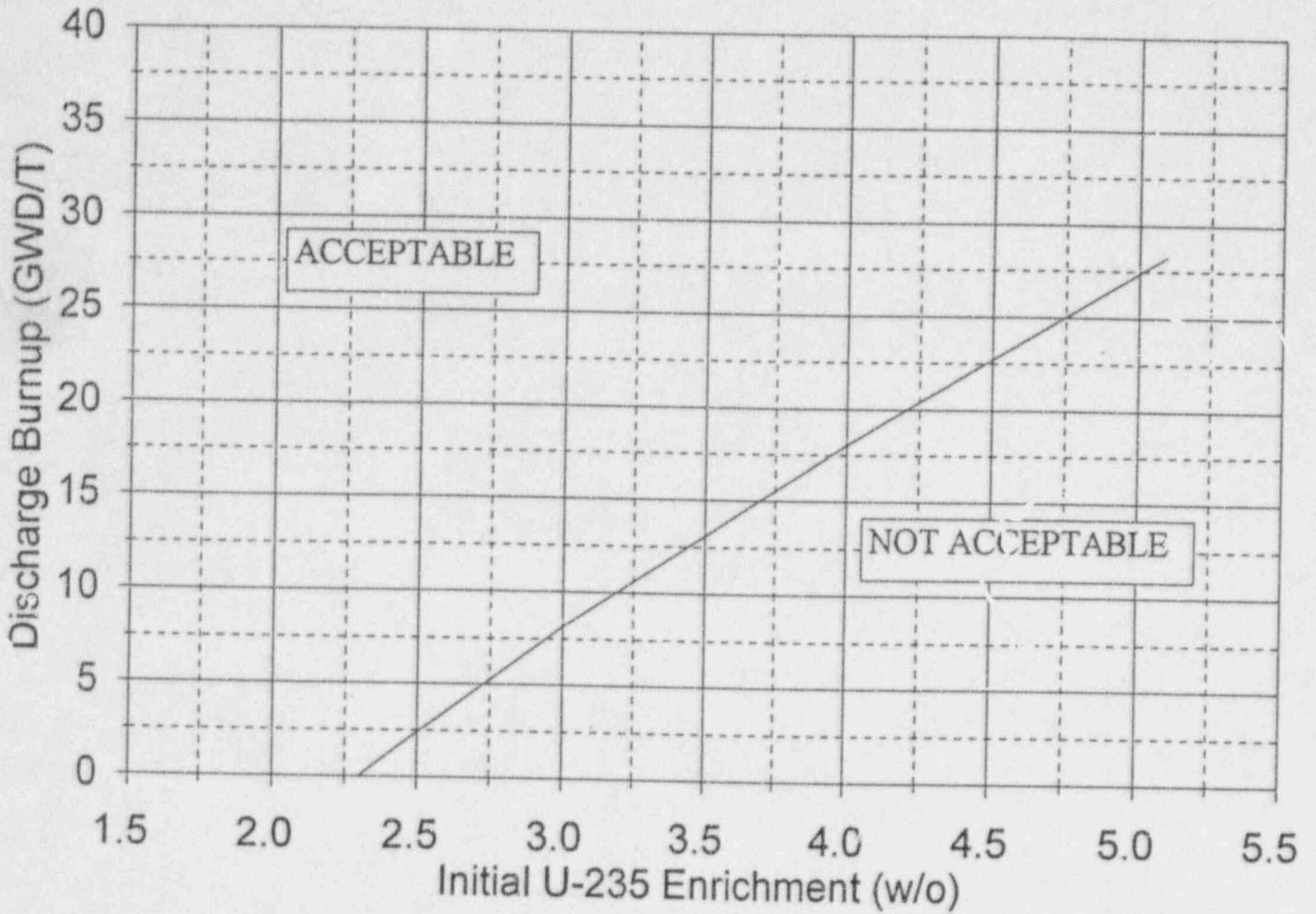
SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.18.1 Verify by administrative means the initial enrichment and burnup of the fuel assembly is in accordance with Figure 3.7.18-1 and 3.7.18-2, or Specification 4.3.1.1, LCO 3.7.18.	Prior to storing the fuel assembly in Region II



MINIMUM BURNUP VS INITIAL ENRICHMENT FOR UNRESTRICTED
PLACEMENT OF SONGS 2 AND 3 FUEL IN REGION II RACKS

FIGURE 3.7.18-1



MINIMUM BURNUP VS INITIAL ENRICHMENT FOR PLACEMENT
OF SONGS 2 AND 3 FUEL IN REGION II PERIPHERAL POOL LOCATIONS

FIGURE 3.7.18-2

3.7 PLANT SYSTEMS

3.7.19 Secondary Specific Activity

LC0 3.7.19 The specific activity of the secondary coolant shall be
 $\leq 0.10 \mu\text{Ci/gm}$ DOSE EQUIVALENT I-131.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Specific activity not within limit.	A.1 Be in MODE 3.	6 hours
	<u>AND</u>	
	A.2 Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.19.1 Verify the specific activity of the secondary coolant is within limit.	31 days

4.0 DESIGN FEATURES (continued)

4.3 Fuel Storage

4.3.1 Criticality

4.3.1.1 The spent fuel storage racks are designed and shall be maintained with:

- a. Fuel assemblies having a maximum U-235 enrichment of ~~4.1~~ 4.8 weight percent;
- b. $K_{eff} \leq 0.95$ if fully flooded with unborated water, which includes an allowance for uncertainties as described in Section 9.1 of the UFSAR;
- c. A nominal 8.85 inch center to center distance between fuel assemblies placed in Region II;
- d. A nominal 10.40 inch center to center distance between fuel assemblies placed in Region I;
- e. Units 1, 2, and 3 Fuel assemblies may be stored in Region I with no restrictions;
- f. Units 2 and 3 Fuel assemblies with a burnup in the "acceptable range" of Figure 3.7.18-1 and Figure ~~3.7.18-2~~ are allowed unrestricted storage in Region II; and
- g. Units 2 and 3 Fuel assemblies with a burnup in the "acceptable range" of Figure 3.7.18-2 are allowed unrestricted storage in the peripheral pool locations with 1 or 2 faces toward the spent fuel pool walls of Region II;
- h. Fuel assemblies with a burnup in the "unacceptable range" of Figure 3.7.18-1 ~~or and~~ Figure 3.7.18-2 will be stored in compliance with the Licensee Controlled Specification 4.0.100; and
- i. The burnup of each SONGS 1 uranium dioxide spent fuel assembly stored in Region II shall be greater than or equal to 18.0 GWD/T for interior locations or 5.5 GWD/T for peripheral locations, or the fuel assembly shall be stored in accordance with Licensee Controlled Specification 4.0.100.

(continued)

4.0 DESIGN FEATURES (continued)

4.3 Fuel Storage (continued)

- 4.3.1.2 The new fuel storage racks are designed and shall be maintained with:
- a. Fuel assemblies having a maximum U-235 enrichment of ~~4.1~~ 4.8 weight percent;
 - b. $K_{eff} \leq 0.95$ if fully flooded with unborated water, which includes an allowance for uncertainties as described in Section 9.1 of the UFSAR;
 - c. $K_{eff} \leq 0.98$ if moderated by aqueous foam, which includes an allowance for uncertainties as described in Section 9.1 of the UFSAR; and
 - d. A minimum 29 inch center to center distance between fuel assemblies placed in the storage racks.

4.3.2 Drainage

The spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below Technical Specification 3.7.16 value (23 feet above the top of irradiated fuel assemblies seated in the storage racks).

4.3.3 Capacity

The spent fuel storage pool is designed and shall be maintained with a storage capacity limited to no more than 1542 fuel assemblies.

(continued)

ATTACHMENT "D"

REVISED TECHNICAL SPECIFICATION IMPROVEMENT PROGRAM
(PCN 299) TECHNICAL SPECIFICATIONS

UNIT 3

3.7 PLANT SYSTEMS

3.7.18 Spent Fuel Assembly Storage

LCO 3.7.18 The combination of initial enrichment and burnup of each SONGS 2 and 3 spent fuel assembly stored in Region II shall be within the acceptable burnup domain of Figure 3.7.18-1 and or Figure 3.7.18-2, or the fuel assembly shall be stored in accordance with Licensee Controlled Specification 4.3.1.1 4.0.100.

The burnup of each SONGS 1 uranium dioxide spent fuel assembly stored in Region II shall be greater than or equal to 18.0 GWD/T for interior locations or 5.5 GWD/T for peripheral locations, or the fuel assembly shall be stored in accordance with Licensee Controlled Specification 4.0.100.

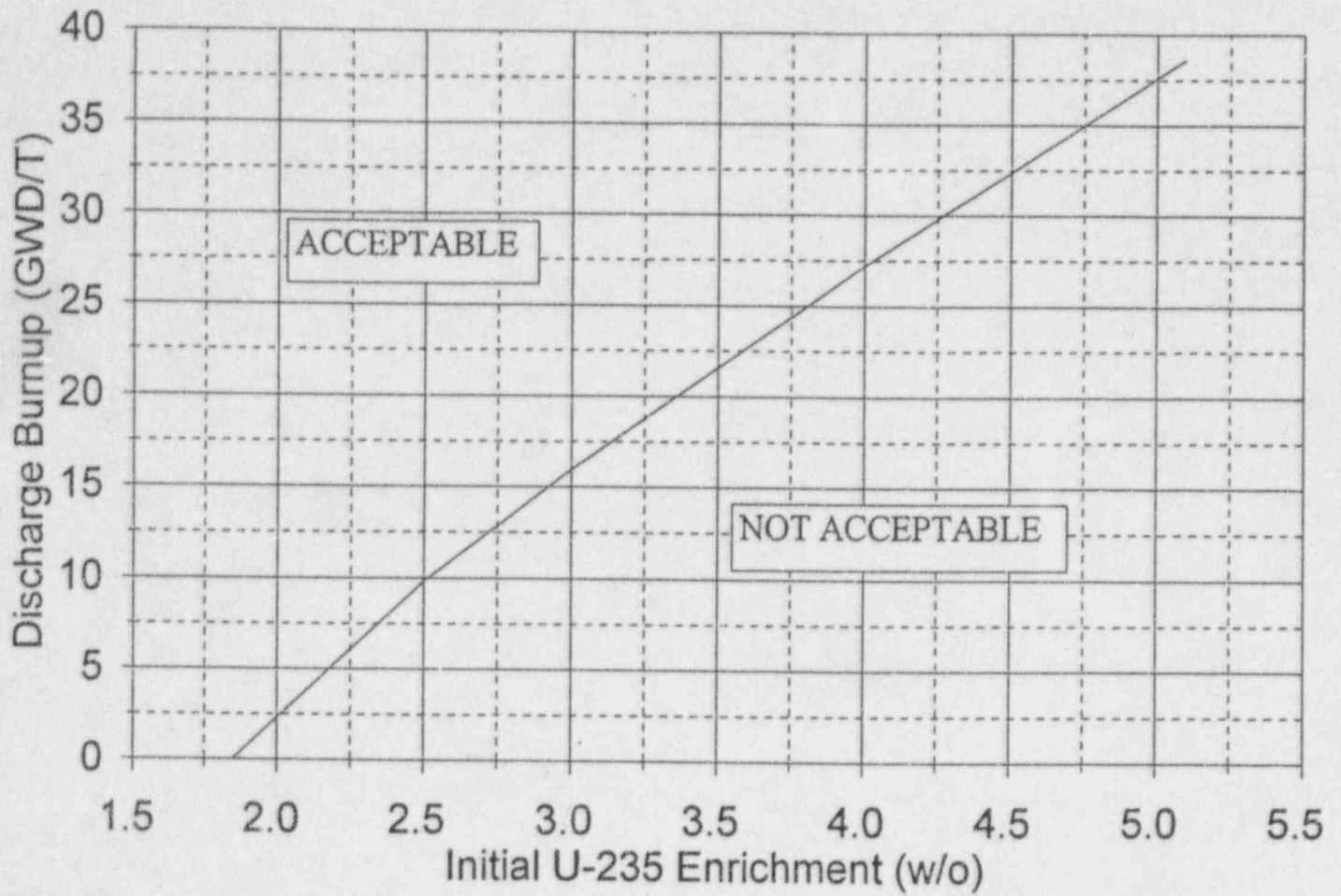
APPLICABILITY: Whenever any fuel assembly is stored in Region II of the fuel storage pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of the LCO not met.	A.1 -----NOTE----- LCO 3.0.3 is not applicable. ----- Initiate action to move the noncomplying fuel assembly from Region II.	Immediately

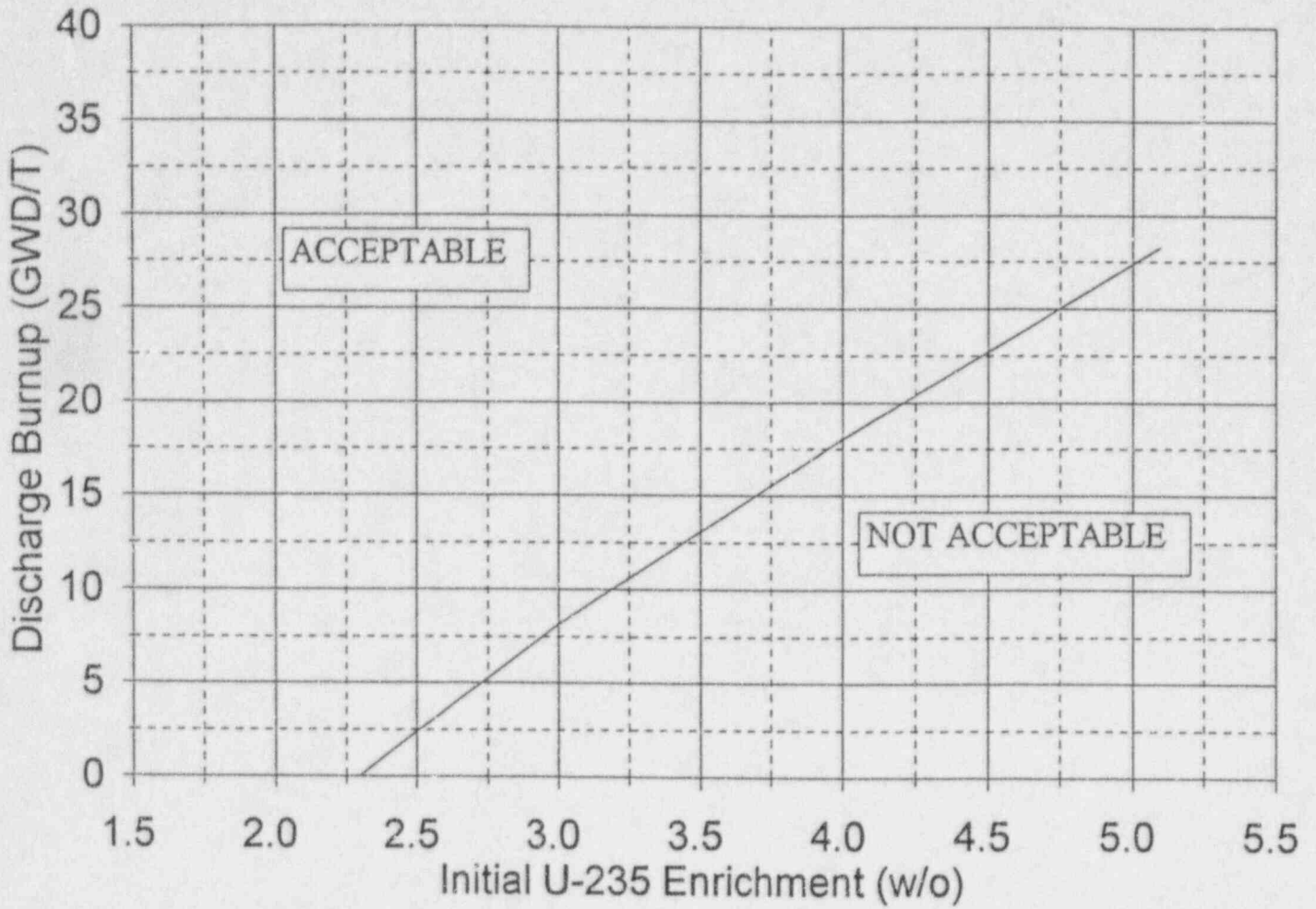
SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.18.1 Verify by administrative means the initial enrichment and burnup of the fuel assembly is in accordance with Figure 3.7.18-1 and 3.7.18-2, or Specification 4.3.1.1. LCO 3.7.18.	Prior to storing the fuel assembly in Region II



MINIMUM BURNUP VS INITIAL ENRICHMENT FOR UNRESTRICTED
PLACEMENT OF SONGS 2 AND 3 FUEL IN REGION II RACKS

FIGURE 3.7.18-1



MINIMUM BURNUP VS INITIAL ENRICHMENT FOR PLACEMENT
OF SONGS 2 AND 3 FUEL IN REGION II PERIPHERAL POOL LOCATIONS

FIGURE 3.7.18-2

3.7 PLANT SYSTEMS

3.7.19 Secondary Specific Activity

LCO 3.7.19 The specific activity of the secondary coolant shall be
 $\leq 0.10 \mu\text{Ci/gm}$ DOSE EQUIVALENT I-131.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Specific activity not within limit.	A.1 Be in MODE 3.	6 hours
	<u>AND</u>	
	A.2 Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.19.1 Verify the specific activity of the secondary coolant is within limit.	31 days

4.0 DESIGN FEATURES

4.3 Fuel Storage

4.3.1 Criticality

- 4.3.1.1 The spent fuel storage racks are designed and shall be maintained with:
- a. Fuel assemblies having a maximum U-235 enrichment of ~~4.1~~ 4.8 weight percent;
 - b. $K_{eff} \leq 0.95$ if fully flooded with unborated water, which includes an allowance for uncertainties as described in Section 9.1 of the UFSAR;
 - c. A nominal 8.85 inch center to center distance between fuel assemblies placed in Region II;
 - d. A nominal 10.40 inch center to center distance between fuel assemblies placed in Region I;
 - e. Units 1, 2, and 3 Fuel assemblies may be stored in Region I with no restrictions;
 - f. Units 2 and 3 Fuel assemblies with a burnup in the "acceptable range" of Figure 3.7.18-1 and ~~Figure 3.7.18-2~~ are allowed unrestricted storage in Region II; and
 - g. Units 2 and 3 fuel assemblies with a burnup in the "acceptable range" of Figure 3.7.18-2 are allowed unrestricted storage in the peripheral pool locations with 1 or 2 faces toward the spent fuel pool walls of Region II;
 - h. Fuel assemblies with a burnup in the "unacceptable range" of Figure 3.7.18-1 or ~~and~~ Figure 3.7.18-2 will be stored in compliance with ~~the~~ Licensee Controlled Specification 4.0.100; and
 - i. The burnup of each SONGS 1 uranium dioxide spent fuel assembly stored in Region II shall be greater than or equal to 18.0 GWD/T for interior locations or 5.5 GWD/T for peripheral locations, or the fuel assembly shall be stored in accordance with Licensee Controlled Specification 4.0.100.

(continued)

4.0 DESIGN FEATURES (continued)

4.3 Fuel Storage (continued)

4.3.1.2 The new fuel storage racks are designed and shall be maintained with:

- a. Fuel assemblies having a maximum U-235 enrichment of ~~4.1~~ 4.8 weight percent;
- b. $K_{eff} \leq 0.95$ if fully flooded with unborated water, which includes an allowance for uncertainties as described in Section 9.1 of the UFSAR;
- c. $K_{eff} \leq 0.98$ if moderated by aqueous foam, which includes an allowance for uncertainties as described in Section 9.1 of the UFSAR; and
- d. A minimum 29 inch center to center distance between fuel assemblies placed in the storage racks.

4.3.2 Drainage

The spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below Technical Specification 3.7.16 value (23 feet above the top of irradiated fuel assemblies seated in the storage racks).

4.3.3 Capacity

The spent fuel storage pool is designed and shall be maintained with a storage capacity limited to no more than 1542 fuel assemblies.

(continued)

ATTACHMENT "F"

REVISED BASES

B 3.7 PLANT SYSTEMS

B 3.7.17 Fuel Storage Pool Boron Concentration

BASES

BACKGROUND As described in LCO 3.7.18, "Spent Fuel Assembly Storage," fuel assemblies are stored in the spent fuel racks in accordance with criteria based on initial enrichment and discharge burnup. Although the water in the spent fuel pool is normally borated to ≥ 1850 ppm, the criteria that limit the storage of a fuel assembly to specific rack locations is conservatively developed without taking credit for boron.

APPLICABLE SAFETY ANALYSES A fuel assembly could be inadvertently loaded into a spent fuel rack location not allowed by LCO 3.7.18 (e.g., an un-irradiated fuel assembly or an insufficiently depleted fuel assembly). This accident is analyzed assuming the extreme case of completely loading the Region II fuel pool racks with nine (3x3 array in the worst case) un-irradiated assemblies of maximum enrichment which bounds 4.8 w/o. Another type of postulated accident is associated with a fuel assembly that is dropped onto the fully loaded fuel pool storage rack. Either incident could have a positive reactivity effect, decreasing the margin to criticality. However, the negative reactivity effect of the soluble boron compensates for the increased reactivity caused by either one of the two postulated accident scenarios.

The concentration of dissolved boron in the fuel pool satisfies Criterion 2 of the NRC Policy Statement.

LCO The specified concentration of dissolved boron in the fuel pool preserves the assumptions used in the analyses of the potential accident scenarios described above. This concentration of dissolved boron is the minimum required concentration for fuel assembly storage and movement within the fuel pool.

APPLICABILITY This LCO applies whenever fuel assemblies are stored in the spent fuel pool until a complete spent fuel pool

(continued)

B 3.7 PLANT SYSTEMS

B 3.7.18 Spent Fuel Assembly Storage

BASES

BACKGROUND The spent fuel storage facility is designed to store either new (nonirradiated) nuclear fuel assemblies, or burned (irradiated) fuel assemblies in a vertical configuration underwater. The storage pool is sized to store 1542 fuel assemblies. Two types/sizes of spent fuel storage racks are used (Region I and Region II). The two Region I racks each contain 156 storage locations each spaced 10.40 inches on center in a 12x13 array. The six Region II storage racks contain 210 storage locations in a 14x15 array. The remaining two Region II racks contain 195 locations in a 13x15 array. All locations are spaced 8.85 inches on center. This spacing and "flux trap" construction, whereby the fuel assemblies are inserted into neutron absorbing stainless steel cans, is sufficient to maintain a k_{eff} of ≤ 0.95 for spent fuel of original enrichment of up to ~~4.1~~ 4.8%. However, as higher initial enrichment fuel assemblies are stored in the spent fuel pool, they must be stored in a checkerboard pattern taking into account fuel burnup to maintain a k_{eff} of 0.95 or less.

APPLICABLE SAFETY ANALYSES The spent fuel storage facility is designed for noncriticality by use of adequate spacing, and "flux trap" construction whereby the fuel assemblies are inserted into neutron absorbing stainless steel cans.

The spent fuel assembly storage satisfies Criterion 2 of the NRC Policy Statement.

LCO The restrictions on the placement of fuel assemblies within the spent fuel pool, ~~according to Figure 3.7.18-1 and Figure 3.7.18-2,~~ in the accompanying LCO, ensures that the k_{eff} of the spent fuel pool will always remain < 0.95 assuming the pool to be flooded with unborated water. The restrictions are consistent with the criticality safety analysis performed for the spent fuel pool according to the LCO.

(continued)

BASES

LCO (continued) ~~Figure 3.7.18-1 and Figure 3.7.18-2, in the accompanying LCO. Fuel assemblies not meeting the criteria of LCO Figure 3.7.18-1 and Figure 3.7.18-2 shall be stored in accordance with Specification 4.3.1.1.~~

APPLICABILITY This LCO applies whenever any fuel assembly is stored in Region II of the spent fuel pool.

ACTIONS A.1

Required Action A.1 is modified by a Note indicating that LCO 3.0.3 does not apply.

When the configuration of fuel assemblies stored in Region II of the spent fuel pool is not in accordance with Figure 3.7.18-1 and Figure 3.7.18-2, immediate action must be taken to make the necessary fuel assembly movement(s) to bring the configuration into compliance with ~~Figure 3.7.18-1 and Figure 3.7.18-2~~ the LCO.

If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operation. Therefore, in either case, inability to move fuel assemblies is not sufficient reason to require a reactor shutdown.

SURVEILLANCE REQUIREMENTS SR 3.7.18.1

This SR verifies by administrative means that the initial enrichment and burnup of the fuel assembly is in accordance with ~~Figure 3.7.18-1 and Figure 3.7.18-2~~ in the accompanying LCO. For fuel assemblies in the unacceptable range of the LCO ~~Figure 3.7.18-1 and Figure 3.7.18-2~~, performance of this SR will ensure compliance with Specification 4.3.1.1.

REFERENCES UFSAR, Section 9.1.2.2.

B 3.7 PLANT SYSTEMS

B 3.7.17 Fuel Storage Pool Boron Concentration

BASES

BACKGROUND As described in LCO 3.7.18, "Spent Fuel Assembly Storage," fuel assemblies are stored in the spent fuel racks in accordance with criteria based on initial enrichment and discharge burnup. Although the water in the spent fuel pool is normally borated to ≥ 1850 ppm, the criteria that limit the storage of a fuel assembly to specific rack locations is conservatively developed without taking credit for boron.

APPLICABLE SAFETY ANALYSES A fuel assembly could be inadvertently loaded into a spent fuel rack location not allowed by LCO 3.7.18 (e.g., an un-irradiated fuel assembly or an insufficiently depleted fuel assembly). This accident is analyzed assuming ~~the extreme ease of completely~~ loading the Region II fuel pool racks with nine (3x3 array in the worst case) un-irradiated assemblies of ~~maximum~~ an enrichment which bounds 4.8 w/o. Another type of postulated accident is associated with a fuel assembly that is dropped onto the fully loaded fuel pool storage rack. Either incident could have a positive reactivity effect, decreasing the margin to criticality. However, the negative reactivity effect of the soluble boron compensates for the increased reactivity caused by either one of the two postulated accident scenarios.

The concentration of dissolved boron in the fuel pool satisfies Criterion 2 of the NRC Policy Statement.

LCO The specified concentration of dissolved boron in the fuel pool preserves the assumptions used in the analyses of the potential accident scenarios described above. This concentration of dissolved boron is the minimum required concentration for fuel assembly storage and movement within the fuel pool.

APPLICABILITY This LCO applies whenever fuel assemblies are stored in the spent fuel pool until a complete spent fuel pool

(continued)

B 3.7 PLANT SYSTEMS

B 3.7.18 Spent Fuel Assembly Storage

BASES

BACKGROUND

The spent fuel storage facility is designed to store either new (nonirradiated) nuclear fuel assemblies, or burned (irradiated) fuel assemblies in a vertical configuration underwater. The storage pool is sized to store 1542 fuel assemblies. Two types/sizes of spent fuel storage racks are used (Region I and Region II). The two Region I racks each contain 156 storage locations each spaced 10.40 inches on center in a 12x13 array. The six Region II storage racks contain 210 storage locations in a 14x15 array. The remaining two Region II racks contain 195 locations in a 13x15 array. All locations are spaced 8.85 inches on center. This spacing and "flux trap" construction, whereby the fuel assemblies are inserted into neutron absorbing stainless steel cans, is sufficient to maintain a k_{eff} of ≤ 0.95 for spent fuel of original enrichment of up to ~~4.1~~ 4.8%. However, as higher initial enrichment fuel assemblies are stored in the spent fuel pool, they must be stored in a checkerboard pattern taking into account fuel burnup to maintain a k_{eff} of 0.95 or less.

APPLICABLE
SAFETY ANALYSES

The spent fuel storage facility is designed for noncriticality by use of adequate spacing, and "flux trap" construction whereby the fuel assemblies are inserted into neutron absorbing stainless steel cans.

The spent fuel assembly storage satisfies Criterion 2 of the NRC Policy Statement.

LCO

The restrictions on the placement of fuel assemblies within the spent fuel pool, ~~according to Figure 3.7.18-1 and Figure 3.7.18-2,~~ in the accompanying LCO, ensures that the k_{eff} of the spent fuel pool will always remain < 0.95 assuming the pool to be flooded with unborated water. The restrictions are consistent with the criticality safety analysis performed for the spent fuel pool according to the LCO.

(continued)

BASES

LCO
(continued) ~~Figure 3.7.18-1 and Figure 3.7.18-2, in the accompanying LCO. Fuel assemblies not meeting the criteria of LCO Figure 3.7.18-1 and Figure 3.7.18-2 shall be stored in accordance with Specification 4.3.1.1.~~

APPLICABILITY This LCO applies whenever any fuel assembly is stored in Region II of the spent fuel pool.

ACTIONS A.1

Required Action A.1 is modified by a Note indicating that LCO 3.0.3 does not apply.

When the configuration of fuel assemblies stored in Region II of the spent fuel pool is not in accordance with Figure 3.7.18-1 and Figure 3.7.18-2, immediate action must be taken to make the necessary fuel assembly movement(s) to bring the configuration into compliance with ~~Figure 3.7.18-1 and Figure 3.7.18-2~~ the LCO.

If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operation. Therefore, in either case, inability to move fuel assemblies is not sufficient reason to require a reactor shutdown.

SURVEILLANCE REQUIREMENTS SR 3.7.18.1

This SR verifies by administrative means that the initial enrichment and burnup of the fuel assembly is in accordance with ~~Figure 3.7.18-1 and Figure 3.7.18-2~~ in the accompanying LCO. For fuel assemblies in the unacceptable range of the LCO ~~Figure 3.7.18-1 and Figure 3.7.18-2~~, performance of this SR will ensure compliance with Specification 4.3.1.1.

REFERENCES UFSAR, Section 9.1.2.2.
