3/4.9.12 SPENT FUEL ASSEMBLY STORAGE

LIMITING CONDITION FOR OPERATION

3.9.12 The combination of initial enrichment and cumulative ~~exposure~~ burnup for spent fuel assemblies stored in Regions 2 and 3 shall be within the acceptable domain of Figure 3.9-1 for Region 2 and Figure 3.9-2 for Region 3.

APPLICABILITY: Whenever irradiated fuel assemblies are in the spent fuel pool.

ACTION:

a. With the requirements of the above specification not satisfied, suspend all other movement of fuel assemblies and crane operations with loads in the fuel storage areas and move the non-complying fuel assemblies to Region 1. Until these requirements of the above specification are satisfied, boron concentration of the spent fuel pool shall be verified to be greater than or equal to 2000 ppm at least once per 8 hours.

b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.9.12 The burnup of each spent fuel assembly stored in Regions 2 and 3 shall be ascertained by careful analysis of its burnup history prior to storage in Region 2 or 3. A complete record of such analysis shall be kept for the time period that the spent fuel assembly remains in Region 2 or 3 of the spent fuel pool.

3/4.9.12 SPENT FUEL ASSEMBLY STORAGE

LIMITING CONDITION FOR OPERATION

3.9.12 The combination of initial enrichment and cumulative burnup for spent fuel assemblies stored in Regions 2 and 3 shall be within the acceptable domain of Figure 3.9-1 for Region 2 and Figure 3.9-2 for Region 3.

APPLICABILITY: Whenever irradiated fuel assemblies are in the spent fuel pool.

ACTION:

a. With the requirements of the above specification not satisfied, suspend all other movement of fuel assemblies and crane operations with loads in the fuel storage areas and move the non-complying fuel assemblies to Region 1. Until these requirements of the above specification are satisfied, boron concentration of the spent fuel pool shall be verified to be greater than or equal to 2000 ppm at least once per 8 hours.

b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable

SURVEILLANCE REQUIREMENTS

4.9.12 The burnup of each spent fuel assembly stored in Regions 2 and 3 shall be ascertained by careful analysis of its burnup history prior to storage in Region 2 or 3. A complete record of such analysis shall be kept for the time period that the spent fuel assembly remains in Region 2 or 3 of the spent fuel pool.

see attached

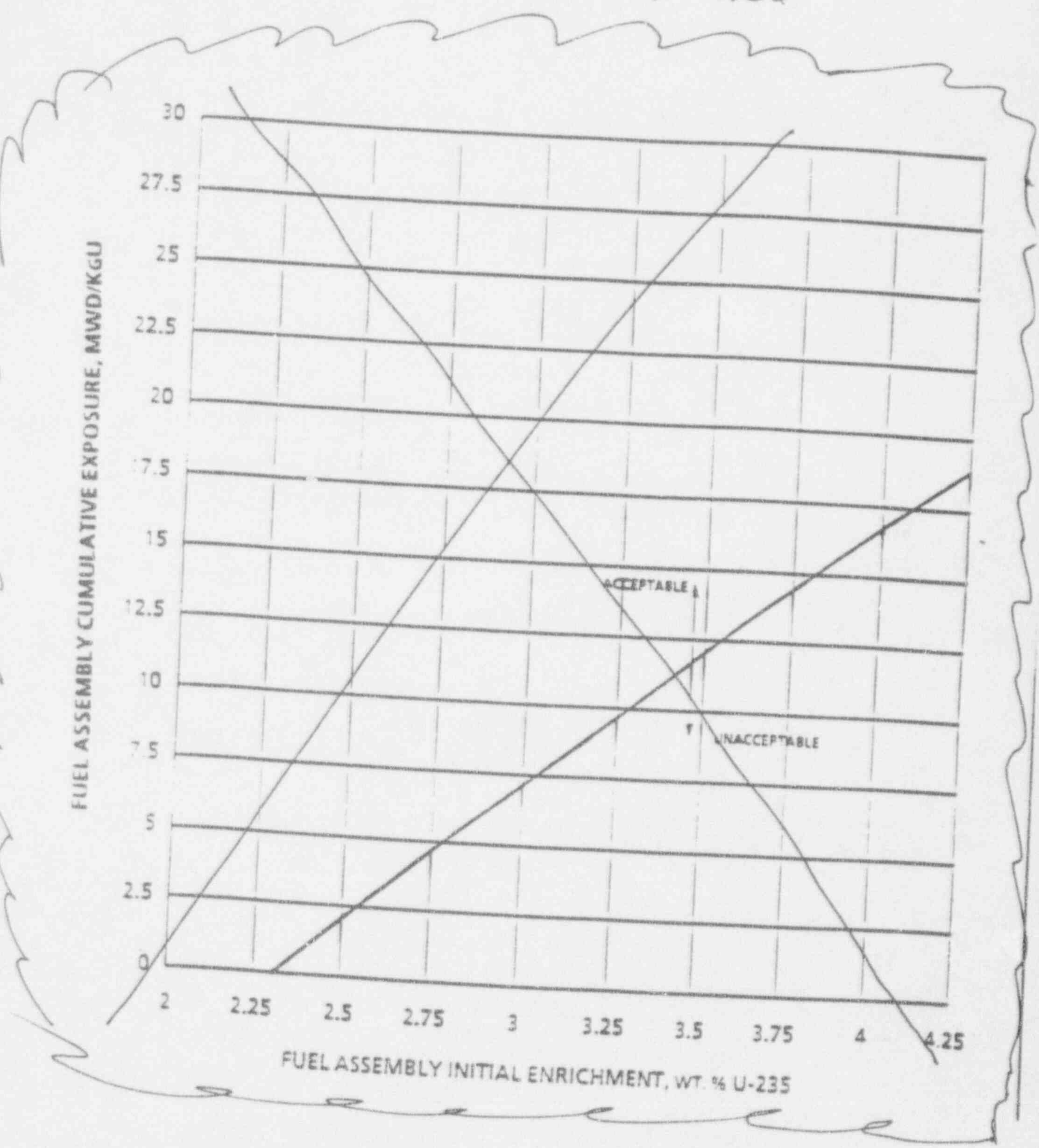
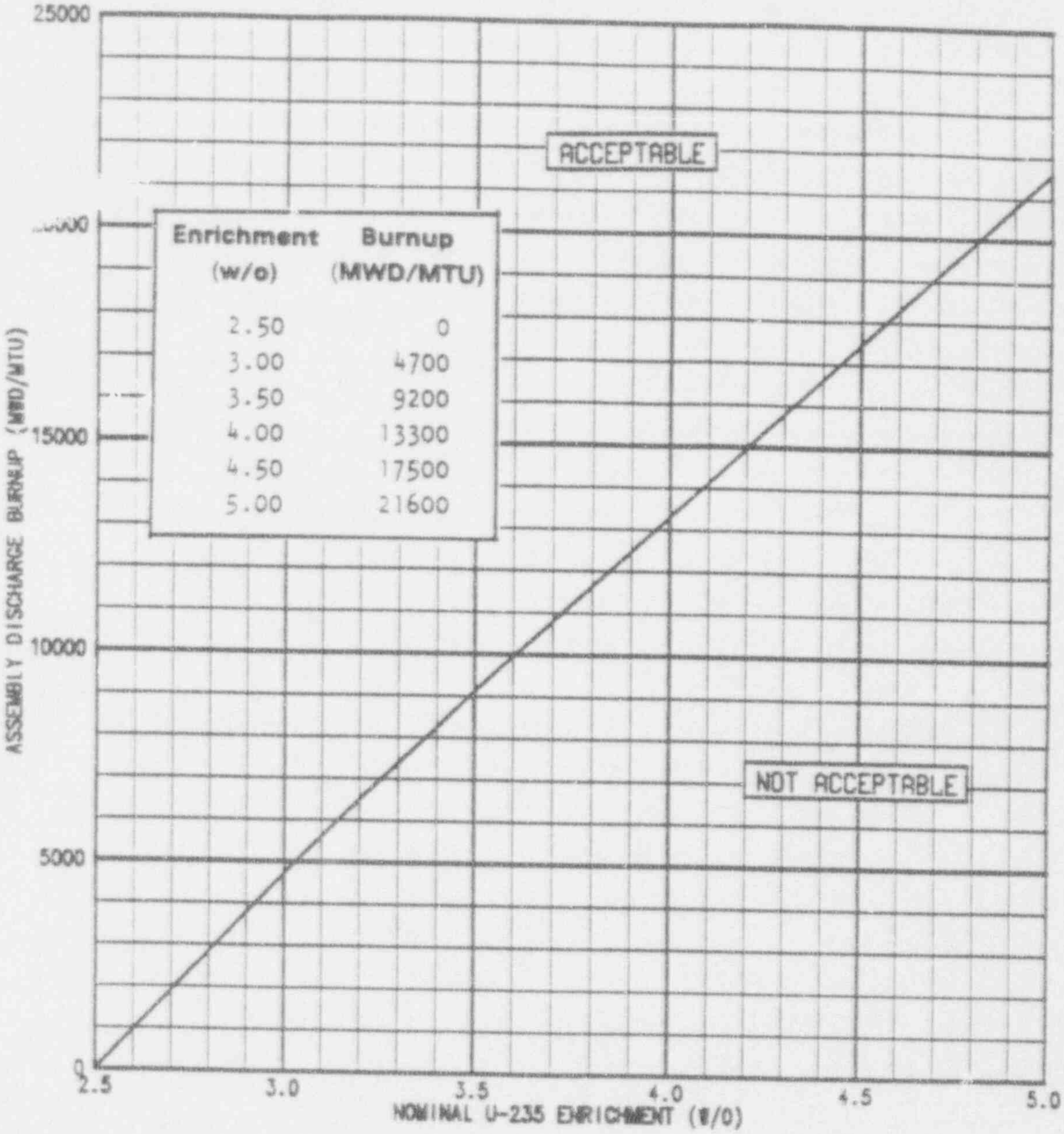


FIGURE 3.9-1 MINIMUM REQUIRED FUEL ASSEMBLY ~~EXPOSURE~~ BURNUP AS A FUNCTION OF INITIAL ENRICHMENT TO PERMIT STORAGE IN REGION 2



Enrichment (w/o)	Burnup (MWD/MTU)
2.50	0
3.00	4700
3.50	9200
4.00	13300
4.50	17500
5.00	21600

Note: The use of linear interpolation between the minimum burnups reported above is acceptable.

FIGURE 3.9-1 MINIMUM REQUIRED FUEL ASSEMBLY BURNUP AS A FUNCTION OF INITIAL ENRICHMENT TO PERMIT STORAGE IN REGION 2 see attached

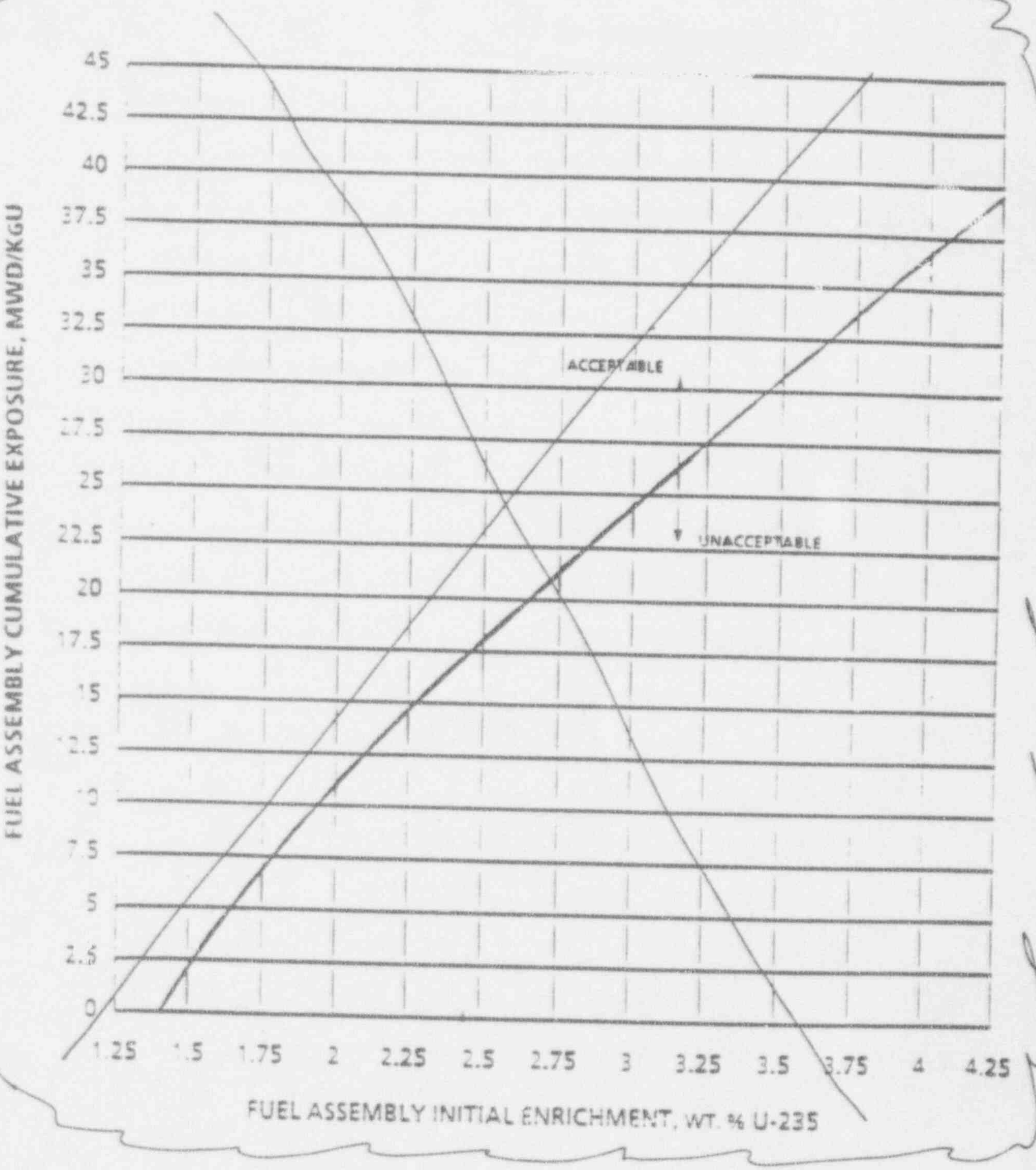
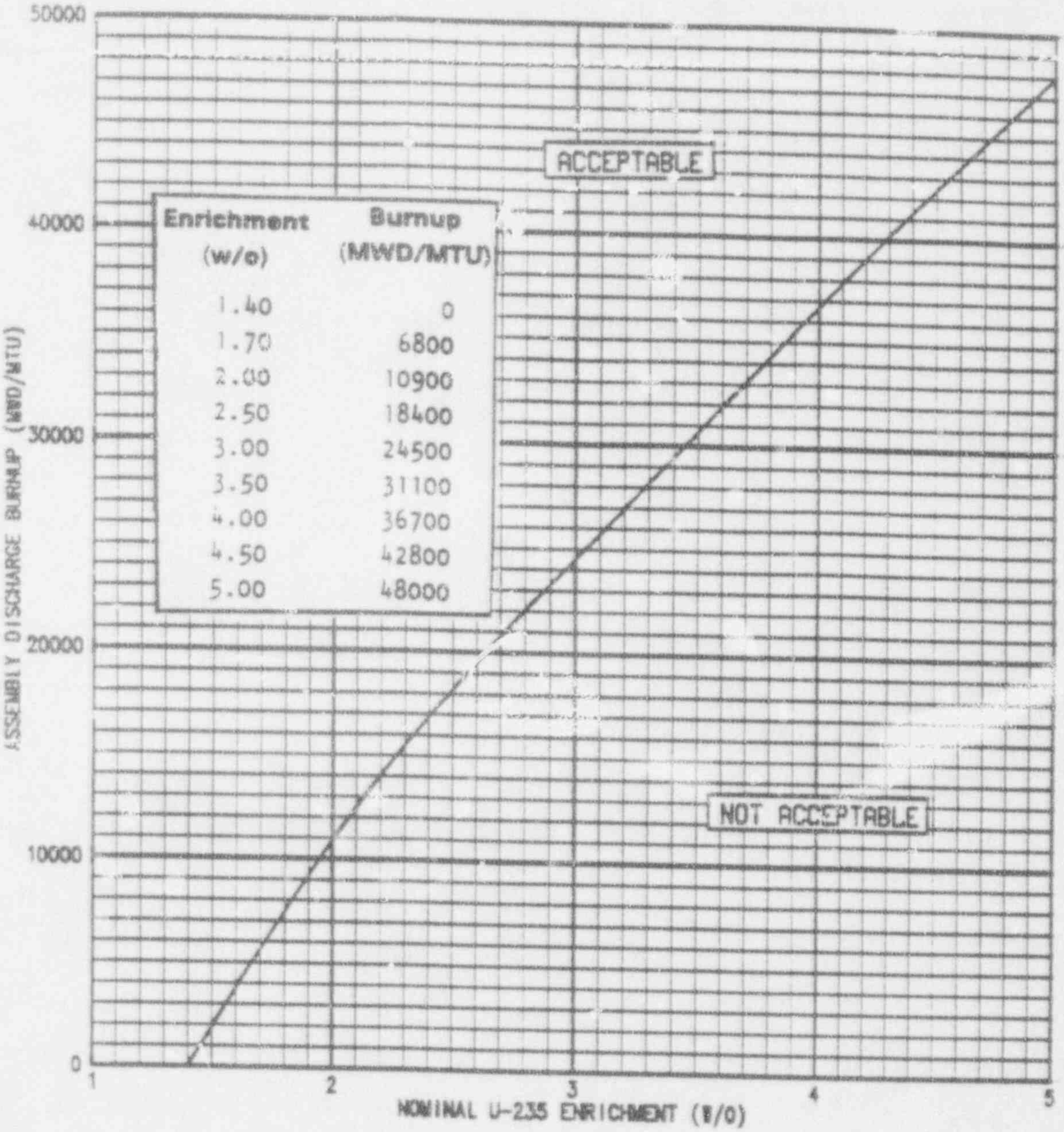


FIGURE 3.9-2 MINIMUM REQUIRED FUEL ASSEMBLY ~~EXPOSURE~~ BURNUP AS A FUNCTION OF INITIAL ENRICHMENT TO PERMIT STORAGE IN REGION 3



Enrichment (w/o)	Burnup (MWD/MTU)
1.40	0
1.70	6800
2.00	10900
2.50	18400
3.00	24500
3.50	31100
4.00	36700
4.50	42800
5.00	48000

Note: The use of linear interpolation between the minimum burnups reported above is acceptable.

FIGURE 3.9-2 MINIMUM REQUIRED FUEL ASSEMBLY BURNUP AS A FUNCTION OF INITIAL ENRICHMENT TO PERMIT STORAGE IN REGION 3

5.3 REACTOR CORE

FUEL ASSEMBLIES

See Attached

5.3.1 The reactor core shall contain 157 fuel assemblies with each fuel assembly normally containing 264 fuel rods with Zircaloy-4 or ZIRLO alloy cladding, except that limited substitution of fuel rods by filler rods consisting of Zircaloy-4, ZIRLO alloy, stainless steel, or by vacancies, may be made if justified by a cycle specific reload analysis. Each fuel rod shall have a nominal active fuel length of 144 inches. The initial core loading shall have a maximum enrichment of 3.2 weight percent U-235. Reload fuel shall be similar in physical design to the initial core loading and shall have a maximum enrichment of 4.25 weight percent U-235.

CONTROL ROD ASSEMBLIES

5.3.2 The reactor core shall contain 48 full length control rod assemblies. The full length control rod assemblies shall contain a nominal 142 inches of absorber material. The nominal values of absorber material shall be 80 percent silver, 15 percent indium and 5 percent cadmium. All control rods shall be clad with stainless steel tubing.

5.4 REACTOR COOLANT SYSTEM

DESIGN PRESSURE AND TEMPERATURE

5.4.1 The reactor coolant system is designed and shall be maintained:

a. In accordance with the code requirements specified in Section 5.2 of the FSAR, with allowance for normal degradation pursuant to the applicable Surveillance Requirements,

b. For a pressure of 2485 psig, and

c. For a temperature of 650°F, except for the pressurizer which is 680°F.

VOLUME

5.4.2 The total water and steam volume of the reactor coolant system is 9407 ± 100 cubic feet at a nominal T_{avg} of 586.8°F.

5.5 METEOROLOGICAL TOWER LOCATION

5.5.1 The meteorological tower shall be located as shown on Figure 5.1-1.

5.3 REACTOR CORE

FUEL ASSEMBLIES

5.3.1 The core shall contain 157 fuel assemblies. Each fuel assembly shall consist of 264 Zircaloy-4 or ZIRLO(TM) clad fuel rods with an initial composition of uranium dioxide with a maximum nominal enrichment of 5.0 weight percent U-235 as fuel material. Limited substitutions of Zircaloy-4, ZIRLO(TM) and/or stainless steel filler rods for fuel rods, if justified by a cycle specific reload analysis using an NRC-approved methodology, may be used. Fuel assembly configurations shall be limited to those designs that have been analyzed with applicable NRC staff-approved codes and methods, and shown by tests or cycle-specific reload analyses to comply with all fuel safety design bases. Reload fuel shall contain sufficient integral fuel burnable absorbers such that the requirements of Specifications 5.6.1.1a.2 and 5.6.1.2 b are met. A limited number of lead test assemblies that have not completed representative testing may be placed in non-limiting core locations.

CONTROL ROD ASSEMBLIES

5.3.2 The reactor core shall contain 48 full length control rod assemblies. The full length control rod assemblies shall contain a nominal 142 inches of absorber material. The nominal values of absorber material shall be 80 percent silver, 15 percent indium and 5 percent cadmium. All control rods shall be clad with stainless steel tubing.

5.4 REACTOR COOLANT SYSTEM

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c. For a temperature of 650°F, except for the pressurizer which is 680°F.

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5.4.2 The total water and steam volume of the reactor coolant system is [illegible]407 ± 100 cubic feet at a nominal T_{avg} of 586.8°F.

5.5 METEOROLOGICAL TOWER LOCATION

5.5.1 The meteorological tower shall be located as shown on Figure 5.1-1.

5.6 FUEL STORAGE

See Attached

CRITICALITY

5.6.1.1 The spent fuel storage racks consist of 1276 individual cells, each of which accommodates a single fuel assembly. The cells are grouped into 3 regions. Region 1 is designated for storage of freshly discharged fuel assemblies with enrichments up to 4.25 weigh percent U-235. The cells in Region 2 are reserved for accommodating fuel assemblies with initial enrichments of 4.25 weight percent U-235 and a minimum burnup of 19,000 MWD/MTU. Both Regions 1 and 2 are poisoned. Region 3 cells are capable of accommodating fuel assemblies with initial enrichments of 4.25 weight percent U-235 and a minimum burnup of 39,750 MWD/MTU. The spent fuel storage racks are designed and shall be maintained with:

a. A K_{eff} equivalent to less than or equal to 0.95 when flooded with unborated water, which includes a conservative allowance for uncertainties as described in Section 4.3 of the FSAR.

b. Nominal center-to-center distance between fuel assemblies of 10.4025" in Region 1, 10.4025" x 10.1875" in Region 2, and 10.116" in Region 3.

5.6.1.2 The new fuel storage racks are designed and shall be maintained with a nominal 21 inch center-to-center distance between new fuel assemblies such that K_{eff} will not exceed 0.98 when fuel having a maximum enrichment of 4.25 weight percent U-235 is in place and various densities of unborated water are assumed including aqueous foam moderation. The K_{eff} of $\leq$0.98 includes the conservative allowance for uncertainties described in Section 4.3 of the FSAR.

DRAINAGE

5.6.2 The spent fuel pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 460'3".

5.6 FUEL STORAGE

CRITICALITY

5.6.1.1 The spent fuel storage racks consist of 1276 individual cells, each of which accommodates a single assembly. The cells are grouped into 3 regions. The spent fuel storage racks are designed and shall be maintained with a K_{eff} less than or equal to 0.95 when flooded with unborated water, which includes conservative allowances for uncertainties and biases. This is ensured by maintaining the following for each region:

a. REGION 1 - designated for storage of fresh fuel assemblies and freshly discharged fuel assemblies.

   1. A nominal 10.4025 inch center-to-center distance between fuel assemblies placed in the storage rack.

   2. A maximum nominal enrichment of 5.0 weight percent U-235 with sufficient integral fuel burnable absorbers such that the maximum reference fuel assembly K_{∞} is less than or equal to 1.460 at 68°F.

b. REGION 2 - designated for storage of discharged fuel assemblies.

   1. A nominal 10.4025 x 10.1875 inch center-to-center distance between fuel assemblies placed in the storage rack.

   2. A maximum nominal enrichment of 2.5 weight percent U-235 with no burnup and up to 5.0 weight percent U-235 with a minimum burnup of up to 21,600 MWD/MTU, as specified in Figure 3.9-1.

c. REGION 3 - designated for storage of discharged fuel assemblies.

   1. A nominal 10.116 inch center-to-center distance between fuel assemblies placed in the storage rack.

   2. A maximum nominal enrichment of 1.4 weight percent U-235 with no burnup and up to 5.0 weight percent U-235 with a minimum burnup of up to 48,000 MWD/MTU, as specified in Figure 3.9-2.

5.6.1.2 The new fuel storage racks consist of 60 individual cells, each of which accommodates a single assembly. The new fuel pit storage racks are designed and shall be maintained with a K_{eff} less than or equal to 0.95 when flooded with unborated water and less than or equal to 0.98 for low density optimum moderation conditions, including conservative allowances for uncertainties and biases. This is ensured by maintaining:

a. A nominal 21 inch center-to-center distance between new fuel assemblies placed in the storage rack.

b. A maximum nominal enrichment of 5.0 weight percent U-235 with sufficient integral fuel burnable absorbers such that the maximum reference fuel assembly K_{∞} is less than or equal to 1.460 at 68°F.

CAPACITY

5.6.3 The spent fuel pool is designed and shall be maintained with a storage capacity limited to no more than 1276 fuel assemblies, 242 in Region 1, 99 in Region 2, and 935 in Region 3.

5.7 COMPONENT CYCLIC OR TRANSIENT LIMIT

5.7.1 The components identified in Table 5.7-1 are designed and shall be maintained within the cyclic or transient limits of Table 5.7-1.

DRAINAGE

5.6.2 The spent fuel pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 460'3".

CAPACITY

5.6.3 The spent fuel pool is designed and shall be maintained with a storage capacity limited to no more than 1276 fuel assemblies, 242 in Region 1, 99 in Region 2, and 935 in Region 3.

5.7 COMPONENT CYCLIC OR TRANSIENT LIMIT

5.7.1 The components identified in Table 5.7-1 are designed and shall be maintained within the cyclic or transient limits of Table 5.7-1.

SAFETY EVALUATION FOR INCREASING THE FUEL ENRICHMENT LIMIT AT THE VIRGIL C. SUMMER NUCLEAR STATION TO 5.0 W/O U-235

Description of Amendment Request

Virgil C. Summer Nuclear Station (VCSNS) Technical Specifications 5.3, "Reactor Core," and 5.6,"Fuel Storage," currently limit fuel in the core, the spent fuel pool, and the new fuel storage racks to a maximum enrichment of 4.25 w/o U-235. In addition, Technical Specification 3.9.12, "Spent Fuel Assembly Storage," places restrictions on the cumulative fuel burnup as a function of initial enrichment, up to 4.25 w/o U-235, in Regions 2 and 3 of the VCSNS spent fuel pool. In order to design fuel cycles which produce more energy to support shorter refueling outages, increased capacity factors, and a potential core power uprate to 2900 MWt, and to minimize the impact of discharged fuel assemblies on available spent fuel storage, it is necessary to increase fuel enrichments above the 4.25 w/o limit and to revise the Technical Specification limits. It should be emphasized, however, that approval is not being sought at this time for operation above the currently licensed core power of 2775 MWt.

The proposed amendment is also necessary to revise the restrictions on fuel storage in Regions 1 and 2 of the spent fuel pool to ensure that the design basis for preventing criticality outside the reactor is preserved in the presence of absorber panel shrinkage and gaps. This has been accomplished by requiring integral fuel burnable absorbers in fresh fuel assemblies with enrichments above 4.0 w/o U-235 in Region 1 and revising the minimum burnups for fuel assemblies in Region 2. Integral fuel burnable absorbers consist of neutron absorbing material which is a non-removable or integral part of the fuel assembly once it is manufactured.

With this Technical Specification change request, South Carolina Electric & Gas Company (SCE&G) is proposing to:

1. Revise Specification 5.3.1 to allow uranium dioxide fuel with maximum nominal enrichments up to 5.0 w/o U-235 to be used as fuel material. SCE&G is also proposing to modify Specification 5.3.1 to conform to the example provided by the NRC in Generic Letter 90-02, Supplement 1, to accommodate limited fuel reconstitution based on NRC-approved topical reports. Note that the proposed revision deletes the reference, currently in the VCSNS Technical Specifications, to "vacancies" as a substitute for fuel rods. This is necessary since vacancies are not addressed in WCAP-13060-P-A, "Westinghouse Fuel Assembly Reconstitution Methodology."

2. Extend the restrictions in Specification 3.9.12 on cumulative fuel burnup as a function of initial enrichment for fuel stored in Regions 2 and 3 of the spent fuel pool to 5.0 w/o U-235. The burnups required for storage in Region 2 have also been revised to account for the presence of absorber panel shrinkage and gaps, as described in Attachment IV (Region 3 does not contain absorber panels.). Note however that the use of the measured 95/95 minimum B-10 loading of 0.0033 gm/cm^2 in the Region 2 absorber panels in the attached criticality re-analysis rather than a minimum 0.0015 gm/cm^2 used in the previous criticality analysis (Reference 1) resulted in a net

decrease in the required burnups.

3. Revise Specification 5.6 to make the appropriate changes, described in Attachment I, to restrictions on fuel storage in the spent fuel pool and the new fuel storage racks to extend the maximum allowable fuel enrichment to 5.0 w/o U-235 and to account for the presence of absorber panel shrinkage and gaps in Regions 1 and 2 of the spent fuel pool. This includes the addition of a limit on the maximum reference K_∞ for fuel assemblies to be placed in Region 1.

Safety Evaluation

The design basis for preventing criticality outside the reactor is that, including uncertainties, there is a 95% probability at a 95% confidence level that the Keff of the fuel assembly array will not exceed 0.95 with full density moderation. Additionally for storage racks that are maintained in the dry condition, such as the new fuel racks, Keff must not exceed 0.98 for low density optimum moderation conditions.

Attachment IV presents the results of a criticality re-analysis for the V. C. Summer spent fuel pool including consideration of absorber panel shrinkage in Regions 1 and 2. The analysis was based on maintaining Keff less than or equal to 0.95 for all current Westinghouse 17x17 fuel products. For each spent fuel pool region, the most reactive or limiting fuel assembly type was analyzed to establish the reference Keff and confirm that the 0.95 limit is not exceeded. To provide for future fuel management flexibility, storage limits were developed for enrichments up to and including 5.0 w/o U-235 by taking credit for integral fuel burnable absorbers and accumulated fuel assembly burnup.

The criticality analysis performed for each of the three storage regions produced separate criteria defining the storage limits applicable to each region as follows:

1. New and freshly discharged fuel assemblies with a maximum nominal enrichment of 5.0 w/o U-235 may be stored in Region 1. Fuel assemblies stored in Region 1 must contain sufficient integral fuel burnable absorbers such that the maximum reference fuel K_∞ is less than or equal to 1.460 at 68°F.

2. Fuel assemblies with a maximum nominal enrichment of 2.5 w/o U-235 with no burnup and up to 5.0 w/o U-235 with a minimum burnup of up to 21,600 MWD/MTU, as specified in proposed Technical Specification Figure 3.9-1, may be stored in Region 2.

3. Fuel assemblies with a maximum nominal enrichment of 1.4 w/o U-235 with no burnup and up to 5.0 w/o U-235 with a minimum burnup of up to 48,000 MWD/MTU, as specified in proposed Technical Specification Figure 3.9-2 may be stored in Region 3.

   Most accident conditions will not result in an increase in Keff. However, as discussed in Attachment IV, accidents can be postulated that could cause reactivity to increase. For these accident conditions, the double contingency principle of ANSI/ANS 8.1-1983 can be applied. This states that one is not required to assume two unlikely, independent, concurrent events to ensure protection against criticality accidents. Thus, for these conditions, the presence of soluble boron in the storage pool water can be assumed as a realistic initial condition since not assuming its presence would be a second unlikely event.

The most severe accident scenario is misplacing a fresh 5.0 w/o U-235 fuel assembly that has no integral fuel burnable absorbers into the center of a fully loaded Region 3 rack. Calculations indicate this event could increase reactivity by as much as 0.10 ΔK. To bound this increase, it is conservatively estimated that 400 ppm of soluble boron is required. Since the V. C. Summer spent fuel pool boron concentration is maintained at a minimum of 2000 ppm whenever fuel handling operations are active, and since it is expected this level of boron would remain in the pool between outages, should a postulated accident occur which causes reactivity to increase, Keff will be maintained less than or equal to 0.95 due to the negative reactivity effect of the dissolved boron.

The new fuel racks have been previously analyzed (Reference 1) for storage of fuel assemblies with enrichments up to 5.0 w/o U-235. For the flooded condition Keff does not exceed 0.95 including conservative allowances for uncertainties and biases. For the normally dry condition Keff does not exceed 0.98 for the low density optimum moderation condition. Since the previous analysis remains valid and applicable, the new fuel racks were not re-analyzed in this evaluation. Due to restrictions on spent fuel storage, the proposed Technical Specification changes require fuel assemblies with enrichments above 4.0 w/o U-235 to contain integral fuel burnable absorbers such that the maximum reference fuel K_∞ is less than or equal to 1.460 in unborated water at 68°F.

Reference

1. Letter from SCE&G [D. A. Nauman to DCD, "Technical Specification Change - Fuel Storage", dated March 8, 1988].

SIGNIFICANT HAZARDS EVALUATION FOR INCREASING THE FUEL ENRICHMENT LIMIT AT THE VIRGIL C. SUMMER NUCLEAR STATION TO 5.0 W/O U-235

Description of Amendment Request

Virgil C. Summer Nuclear Station (VCSNS) Technical Specifications 5.3, "Reactor Core," and 5.6,"Fuel Storage," currently limit fuel in the core, the spent fuel pool, and the new fuel storage racks to a maximum enrichment of 4.25 w/o U-235. In addition, Technical Specification 3.9.12, "Spent Fuel Assembly Storage," places restrictions on the cumulative fuel burnup as a function of initial enrichment, up to 4.25 w/o U-235, in Regions 2 and 3 of the VCSNS spent fuel pool. In order to design fuel cycles which produce more energy to support shorter refueling outages, increased capacity factors, and a potential core power uprate to 2900 MWt, and to minimize the impact of discharged fuel assemblies on available spent fuel storage, it is necessary to increase fuel enrichments above the 4.25 w/o limit and to revise the Technical Specification limits. It should be emphasized, however, that approval is not being sought at this time for operation above the currently licensed core power of 2775 MWt.

The proposed amendment is also necessary to revise the restrictions on fuel storage in Regions 1 and 2 of the spent fuel pool to ensure that the design basis for preventing criticality outside the reactor is preserved in the presence of absorber panel shrinkage and gaps. This has been accomplished by requiring integral fuel burnable absorbers in fresh fuel assemblies with enrichments above 4.0 w/o U-235 in Region 1 and revising the minimum burnups for fuel assemblies in Region 2. Integral fuel burnable absorbers consist of neutron absorbing material which is a non-removable or integral part of the fuel assembly once it is manufactured.

With this Technical Specification change request, South Carolina Electric & Gas Company (SCE&G) is proposing to:

1. Revise Specification 5.3.1 to allow uranium dioxide fuel with maximum nominal enrichments up to 5.0 w/o U-235 to be used as fuel material. SCE&G is also proposing to modify Specification 5.3.1 to conform to the example provided by the NRC in Generic Letter 90-02, Supplement 1, to accommodate limited fuel reconstitution based on NRC-approved topical reports. Note that the proposed revision deletes the reference, currently in the VCSNS Technical Specifications, to "vacancies" as a substitute for fuel rods. This is necessary since vacancies are not addressed in WCAP-13060-P-A, "Westinghouse Fuel Assembly Reconstitution Methodology."

2. Extend the restrictions in Specification 3.9.12 on cumulative fuel burnup as a function of initial enrichment for fuel stored in Regions 2 and 3 of the spent fuel pool to 5.0 w/o U-235. The burnups required for storage in Region 2 have also been revised to account for the presence of absorber panel shrinkage and gaps, as described in Attachment IV. (Region 3 does not contain absorber panels.) Note however that the use of the measured 95/95 minimum B-10 loading of 0.0033 gm/cm^2 in the Region 2 absorber panels in the attached criticality re-analysis rather than a minimum .0015 gm/cm^2

used in the previous criticality analysis (Reference 1) resulted in a net decrease in the required burnups.

3. Revise Specification 5.6 to make the appropriate changes, described in Attachment I, to restrictions on fuel storage in the spent fuel pool and the new fuel storage racks to extend the maximum allowable fuel enrichment to 5.0 w/o U-235 and to account for the presence of absorber panel shrinkage and gaps in Regions 1 and 2 of the spent fuel pool. This includes the addition of a limit on the maximum reference K∞ for fuel assemblies to be placed in Region 1.

Basis For No Significant Hazards Consideration Determination

SCE&G has evaluated the proposed changes to the VCSNS Technical Specifications described above against the Significant Hazards Criteria of 10CFR50.92 and has determined that the changes do not involve any significant hazard for the following reasons:

1. The probability or consequences of an accident previously evaluated is not significantly increased.

   There is no increase in the probability of an accident because the physical characteristics of a fuel assembly are not changed when fuel enrichment is increased. Fuel assembly movement will continue to be controlled by approved fuel handling procedures.

   There is no increase in the consequences of an accident because fuel cycle designs will continue to be analyzed with NRC-approved codes and methods to ensure the design bases for VCSNS are satisfied. The double contingency principle of ANSI/ANS 8.1-1983 can be applied to any postulated accident in the spent fuel pool which could cause reactivity to increase beyond the analyzed conditions. As shown in Attachment IV, the level of boron in the VCSNS spent fuel pool is sufficient to maintain Keff less than or equal to 0.95. There is no postulated accident which could cause reactivity to increase beyond the analyzed conditions in the new fuel rack.

   The radiological consequence analyses (Reference 2) performed to support the installation of replacement steam generators at VCSNS included the development of source terms which bound fuel enrichments up to 5.0 w/o U235 and average discharge burnups up to 65,730 MWD/MTU, which bounds the currently licensed burnup for fuel at VCSNS. These source terms were used to calculate offsite doses for accidents that are postulated to result in the release of fission products to the environment, including the fuel handling accident. In all cases, the dose results are within 10CFR100 limits.

2. The possibility of an accident or malfunction of a different type than any previously evaluated is not created.

   The proposed Technical Specification changes do not involve any physical changes to the plant or any changes to the method in which the plant is operated. They do not affect the performance or qualification of safety related equipment. Therefore the possibility of a different type of accident or malfunction than previously considered is not created.

3. The margin of safety as defined in the bases of the Technical Specifications is not significantly reduced.

   Criticality analyses (Attachment IV) have been performed for the spent fuel pool to allow for storage of fuel assemblies with enrichments up to 5.0 w/o U-235. The proposed Technical Specification changes include those necessary to maintain Keff less than or equal to 0.95, including conservative allowances for uncertainties and biases, when the pool is flooded with unborated water.

   The new fuel racks have been previously analyzed (Reference 1) for storage of fuel assemblies with enrichments up to 5.0 w/o U-235. For the flooded condition Keff does not exceed 0.95 including conservative allowances for uncertainties and biases. For the normally dry condition Keff does not exceed 0.98 for the low density optimum moderation condition. However, the proposed Technical Specification changes require fuel assemblies with enrichments above 4.0 w/o U-235 to contain integral fuel burnable absorbers such that the maximum reference fuel K_∞ is less than or equal to 1.460 in unborated water at 68°F due to restrictions on spent fuel storage.

   Since the proposed changes ensure that the design basis for preventing criticality in the fuel storage areas is preserved and since fuel cycle designs will continue to be analyzed with NRC-approved codes and methods to ensure the design bases for VCSNS are satisfied, there is no significant reduction in the margin of safety.

References

1. Letter from SCE&G [D. A. Nauman to DCD, "Technical Specification Change - Fuel Storage", dated March 8, 1988].

2. Letter from SCE&G [John L. Skolds to DCD, "Completed Safety Analysis Results to Support Steam Generator Replacement (REM 6000-7)", dated April 30, 1993].

Westinghouse
Commercial Nuclear Fuel Division