PROPOSED TECHNICAL SPECIFICATION CHANGES

MARKUP OF CURRENT ANO-2 TECHNICAL SPECIFICATIONS

(FOR INFO ONLY)

CRITICALITY ANALYSIS

PROPOSED TECHNICAL SPECIFICATION CHANGES

REFUELING OPERATIONS

FUEL STORAGE

LIMITING CONDITION FOR OPERATION

3.9.12.a Storage in the spent fuel pool shall be restricted to fuel assemblies having initial enrichment less than or equal to 5.0 w/o U-235. The provisions of Specification 3.0.3 are not applicable.

3.9.12.b Storage in Region 1 or Region 2 (as shown on Figure 3.9.1) of the spent fuel pool shall be further restricted by the limits specified in Figure 3.9.2. In the event a cross-hatch storage configuration is deemed necessary for a portion of either Region 1 or Region 2, vacant spaces diagonal to the four corners of any fuel assembly or vacant spaces on two opposite faces of any fuel assembly shall be physically blocked before any such fuel assembly may be placed in that region. Also, the Region 1 storage cells adjacent to the Region 2 interface are restricted to fuel assemblies that are outside the area of the graph enclosed by Curve A on Figure 3.9.2. In the event a checkerboard storage configuration is deemed necessary for a portion of Region 2, vacant spaces adjacent to the four faces of any fuel assembly shall be physically blocked before any such fuel assembly may be placed in Region 2. The provisions of Specification 3.0.3 are not applicable.

3.9.12.c The boron concentration in the spent fuel pool shall be maintained (at all times) at greater than 1600 parts per million.

APPLICABILITY: During storage of fuel in the spent fuel pool.

ACTION:

Suspend all actions involving the movement of fuel in the spent fuel pool if it is determined a fuel assembly has been placed in an incorrect location until such time as the correct storage location is determined. Move the assembly to its correct location before resumption of any other fuel movement.

Suspend all actions involving the movement of fuel in the spent fuel pool if it is determined the pool boron concentration is less than 1601 ppm, until such time as the boron concentration is increased to 1601 ppm or greater.

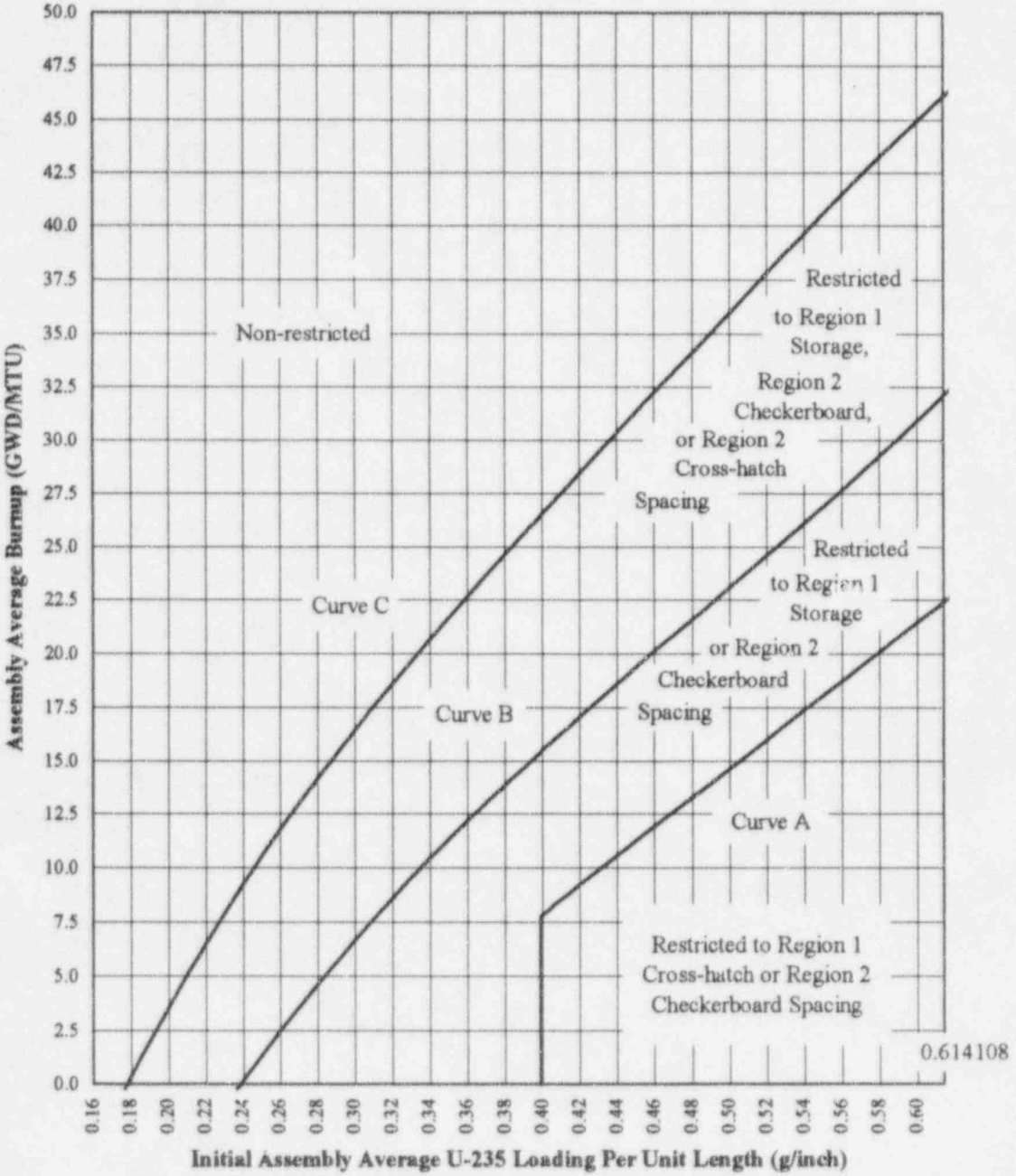
SURVEILLANCE REQUIREMENTS

4.9.12.a Verify all fuel assemblies to be placed in the spent fuel pool have an initial enrichment of less than or equal to 5.0 w/o U-235 by checking the assemblies' design documentation.

4.9.12.b Verify all fuel assemblies to be placed in the spent fuel pool are within the limits of Figure 3.9.2 by checking the assemblies' design and burnup documentation.

4.9.12.c Verify at least once per 31 days the spent fuel pool boron concentration is greater than 1600 ppm.

FIGURE 3.9.2
MINIMUM BURNUP VS. INITIAL ASSEMBLY AVERAGE U-235 LOADING



Curve A = 68.008x-19.366 when x > 0.399181
Curve B = $239.01x^3-347.75x^2+243.18x-41.452$
Curve C = $-714.35x^4+1335.80x^3-946.44x^2+394.52x-47.040$

3/4.9.9 and 3/4.9.10 WATER LEVEL-REACTOR VESSEL AND SPENT FUEL POOL WATER LEVEL

The restrictions on minimum water level ensure that sufficient water depth is available to remove 99% of the assumed 12% iodine gap activity released from the rupture of an irradiated fuel assembly. The minimum water depth is consistent with the assumptions of the accident analysis.

3/4.9.11 FUEL HANDLING AREA VENTILATION SYSTEM

The limitations on the fuel handling area ventilation system ensure that all radioactive materials released from an irradiated fuel assembly will be filtered through the HEPA filters and charcoal adsorbers prior to discharge to the atmosphere. The operation of this system and the resulting iodine removal capacity are consistent with the assumptions of the accident analyses.

3/4.9.12 FUEL STORAGE

Region 1 and Region 2 of the spent fuel storage racks are designed to assure fuel assemblies of less than or equal to 5.0 w/o U-235 enrichment that are within the limits of Figure 3.9-2 will be maintained in a subcritical array with K_{eff} ≤0.95 in unborated water. These conditions have been verified by criticality analyses.

The requirement for 1600 ppm boron concentration is to assure the fuel assemblies will be maintained in a subcritical array with K_{eff} ≤0.95 in the event of a postulated accident.

VOLUME

5.4.2 The total water and steam volume of the reactor coolant system is 10,295 ± 400 cubic feet at a nominal T_{avg} of 545°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

CRITICALITY - SPENT FUEL

5.6.1.1 The spent fuel racks are designed and shall be maintained so that the calculated effective multiplication factor is no greater than 0.95 (including all known uncertainties) when the pool is flooded with unborated water.

CRITICALITY - NEW FUEL

5.6.1.2 The new fuel storage racks are designed and shall be maintained with a nominal 26.0 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 5.0 weight percent U-235 is in place and aqueous foam moderation is assumed and K_{eff} will not exceed 0.95 (including a conservative allowance for uncertainties) when the storage area is flooded with unborated water.

DRAINAGE

5.6.2 The spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 399' 10½".

CAPACITY

5.6.3 The spent fuel storage pool is designed and shall be maintained with a storage capacity limited to no more than 988 fuel assemblies.

5.7 COMPONENT CYCLIC OR TRANSIENT LIMITS

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.

MARKUP OF CURRENT ANO-2 TECHNICAL SPECIFICATIONS

(FOR INFO ONLY)

REFUELING OPERATIONS

FUEL STORAGE

LIMITING CONDITION FOR OPERATION

3.9.12.a Storage in the spent fuel pool shall be restricted to fuel assemblies having initial enrichment less than or equal to ~~4.1~~ 5.0 w/o U-235. The provisions of Specification 3.0.3 are not applicable.

3.9.12.b Storage in Region 1 or Region 2 (as shown on Figure 3.9.1) of the spent fuel pool shall be further restricted by the ~~burnup and enrichment~~ limits specified in Figure 3.9.2. In the event a cross-hatch storage configuration is deemed necessary for a portion of either Region 1 or Region 2, vacant spaces diagonal to the four corners of any fuel assembly or vacant spaces on two opposite faces of any fuel assembly shall be physically blocked before any such fuel assembly may be placed in that region. Also, the Region 1 storage cells adjacent to the Region 2 interface are restricted to fuel assemblies that are outside of the area of the graph enclosed by curve A on Figure 3.9.2. In the event a checkerboard storage configuration is deemed necessary for a portion of Region 2, vacant spaces adjacent to the four faces of any fuel assembly ~~which does not meet the Region 2 burnup criteria (Non-Restricted)~~ shall be physically blocked before any such fuel assembly may be placed in Region 2. ~~This will prevent inadvertent fuel assembly insertion into two adjacent storage locations.~~ The provisions of Specification 3.0.3 are not applicable.

3.9.12.c The boron concentration i the spent fuel pool shall be maintained (at all times) at greate an 1600 parts per million.

APPLICABILITY: During storage of fuel in the spent fuel pool.

ACTION:

Suspend all actions involving the movement of fuel in the spent fuel pool if it is determined a fuel assembly has been placed in ~~the~~ an incorrect ~~Region~~ location until such time as the correct storage location is determined. Move the assembly to its correct location before resumption of any other fuel movement.

Suspend all actions involving the movement of fuel in the spent fuel pool if it is determined the pool boron concentration is less than 1601 ppm, until such time as the boron concentration is increased to 1601 ppm or greater.

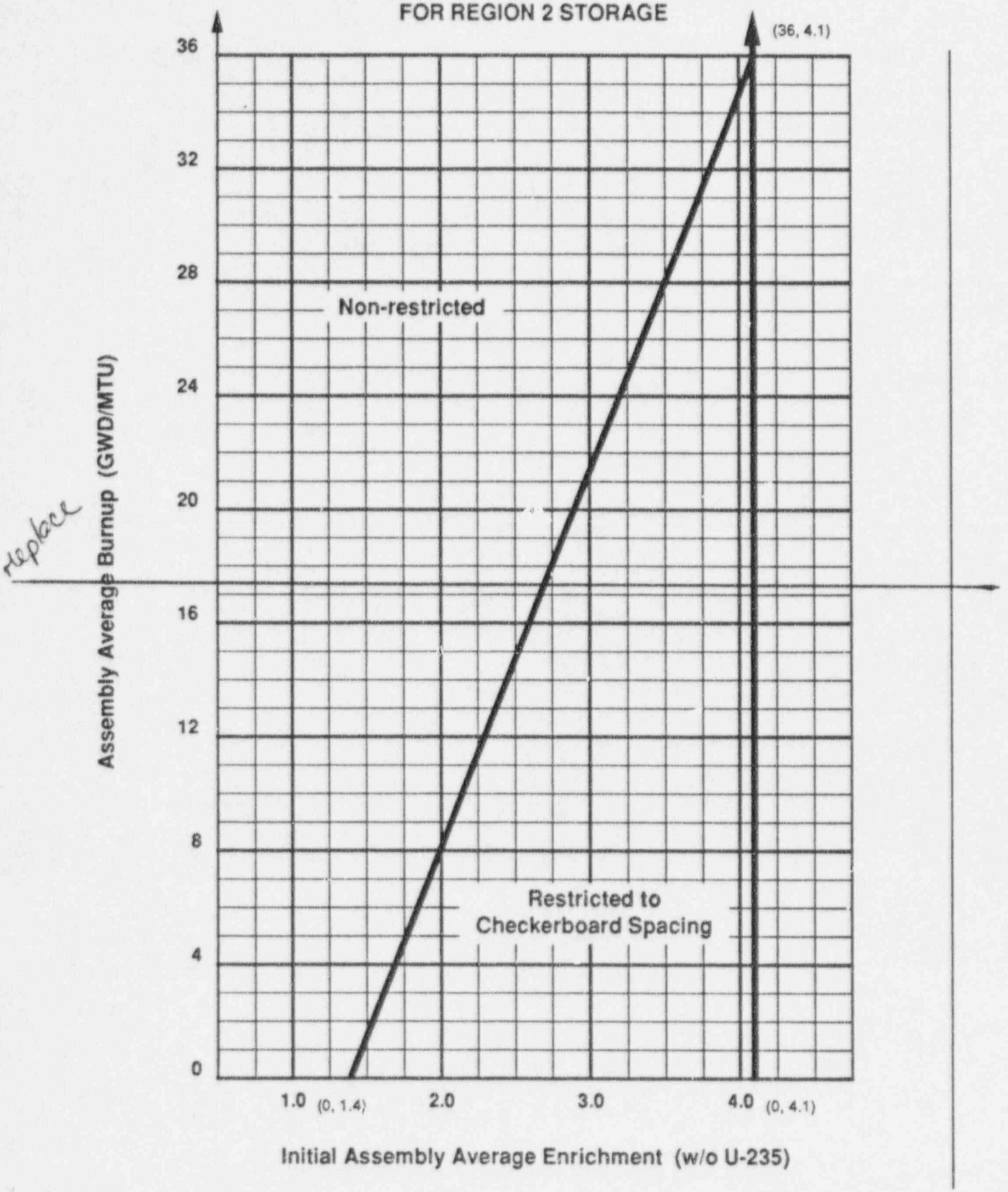
SURVEILLANCE REQUIREMENTS

4.9.12.a Verify all fuel assemblies to be placed in the spent fuel pool ha~~d~~ve an initial enrichment of less than or equal to ~~4.1~~ 5.0 w/o U-235 by checking the assemblies' design documentation.

4.9.12.b Verify all fuel assemblies to be placed in ~~Region 2 of~~ the spent fuel pool are within the ~~enrichment and burnup~~ limits of Figure 3.9.2 by checking the assemblies' design and burnup documentation.

4.9.12.c Verify at least once per 31 days the spent fuel pool boron concentration is greater than 1600 ppm.

FIGURE 3.9.2
MINIMUM BURNUP VS. INITIAL ENRICHMENT
FOR REGION 2 STORAGE



3/4.9.9 and 3/4.9.10 WATER LEVEL-REACTOR VESSEL AND SPENT FUEL POOL WATER LEVEL

The restrictions on minimum water level ensure that sufficient water depth is available to remove 99% of the assumed 12% iodine gap activity released from the rupture of an irradiated fuel assembly. The minimum water depth is consistent with the assumptions of the accident analysis.

3/4.9.11 FUEL HANDLING AREA VENTILATION SYSTEM

The limitations on the fuel handling area ventilation system ensure that all radioactive materials released from an irradiated fuel assembly will be filtered through the HEPA filters and charcoal adsorbers prior to discharge to the atmosphere. The operation of this system and the resulting iodine removal capacity are consistent with the assumptions of the accident analyses.

3/4.9.12 FUEL STORAGE

Region 1 and Region 2 of the spent fuel storage racks ~~is~~ are designed to assure fuel assemblies of less than or equal to ~~4.1~~ 5.0 w/o U-235 enrichment that are ~~will be maintained in a subcritical array with K_{eff} ≤0.95 in unborated water. These conditions have been verified by criticality analyses.~~

~~Region 2 of the spent fuel storage racks is designed to assure fuel assemblies~~ within the ~~burnup and initial enrichment~~ limits of Figure 3.9.2 will be maintained in a subcritical array with K_{eff} ≤0.95 in unborated water. These conditions have been verified by criticality analyses.

The requirement for 1600 ppm boron concentration is to assure the fuel assemblies will be maintained in a subcritical array with K_{eff} ≤0.95 in the event of a postulated accident.

VOLUME

5.4.2 The total water and steam volume of the reactor coolant system is 10,295 ± 400 cubic feet at a nominal T_{avg} of 545°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

CRITICALITY - SPENT FUEL

5.6.1.1 The spent fuel racks are designed and shall be maintained so that the calculated effective multiplication factor is no greater than 0.95 (including all known uncertainties) when the pool is flooded with unborated water.

CRITICALITY - NEW FUEL

5.6.1.2 The new fuel storage racks are designed and shall be maintained with a nominal 2~~5~~6.0 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 ~~4.1~~ 5.0 weight percent U-235 is in place and aqueous foam moderation is assumed and K_{eff} will not exceed 0.95 (including a conservative allowance for uncertainties) when the storage area is flooded with unborated water. ~~The calculated K_{eff} includes a conservative allowance of 2.18 Δk/k for uncertainties.~~

DRAINAGE

5.6.2 The spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 399' 10½".

CAPACITY

5.6.3 The spent fuel storage pool is designed and shall be maintained with a storage capacity limited to no more than 988 fuel assemblies.

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