Docket No. 50-213
B14706

Attachment 1

Haddam Neck Plant

Proposed Revision to Technical Specifications

Administrative Changes - Spent Fuel Pool and New Fuel Storage Racks - Marked up pages of Technical Specifications

January 1994

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BASES

REACTOR TRIP SYSTEM RESPONSE TIME

1.37 The REACTOR TRIP SYSTEM RESPONSE TIME shall be the time interval from when the monitored parameter exceeds its Trip Setpoint at the channel sensor until actuation signal output to the Reactor Trip breakers.

FUEL ASSEMBLY TYPES

1.38 TYPE I FUEL ASSEMBLY IS A FUEL ASSEMBLY WITH AN INITIAL AVERAGE NOMINAL ENRICHMENT LESS THAN OR EQUAL TO 3.2 WEIGHT PERCENT U-235 OR AN AVERAGE ASSEMBLY BURNUP/AVERAGE ASSEMBLY NOMINAL ENRICHMENT AS SHOWN IN FIGURE 3.9-1. THIS DEFINITION APPLIES TO ALL FUEL TYPES (E.G., STAINLESS STEEL OR ZIRCALOY CLADDING, STAINLESS STEEL OR ZIRCALOY SKELETON).

1.39 TYPE II FUEL ASSEMBLY IS A FUEL ASSEMBLY WITH AN INITIAL AVERAGE ASSEMBLY NOMINAL ENRICHMENT GREATER THAN 3.2 WEIGHT PERCENT U-235 AND AN AVERAGE ASSEMBLY BURNUP/AVERAGE ASSEMBLY NOMINAL ENRICHMENT AS SHOWN IN FIGURE 3.9-1. THIS DEFINITION APPLIES TO ALL FUEL TYPES (E.G., STAINLESS STEEL OR ZIRCALOY CLADDING, STAINLESS STEEL OR ZIRCALOY SKELETON).

REFUELING OPERATIONS

3/4.9.13 MOVEMENT OF FUEL IN SPENT FUEL POOL

LIMITING CONDITION FOR OPERATION

3.9.13 Prior to movement of a fuel assembly in the spent fuel pool, the boron concentration of the pool shall be maintained uniform and sufficient to maintain a boron concentration of greater than or equal to 800 ppm.

APPLICABILITY: Whenever a fuel assembly is moved in the spent fuel pool.

ACTION:

With the boron concentration less than 800 ppm, suspend the movement of all fuel in the spent fuel pool.

SURVEILLANCE REQUIREMENT

4.9.13 Verify that the boron concentration is greater than or equal to 800 ppm within 24 hours prior to any movement of a fuel assembly in the spent fuel pool and every 72 hours thereafter.

3/4.9.14 SPENT FUEL POOL--REACTIVITY CONDITION

LIMITING CONDITION FOR OPERATION

3.9.14 The Reactivity Condition of the spent fuel pool shall be such that K_{eff} is less-than-or-equal-to 0.95 at all times.

APPLICABILITY: Whenever fuel is in the spent fuel pool.

ACTION:

Borate until $K_{eff} \leq .95$ is reached.

SURVEILLANCE REQUIREMENT

4.9.14 Ensure that all fuel assemblies to be placed in the spent fuel pool are within the enrichment and burn-up limits of Figure 3.9-1 by checking the assembly's design and burn-up documentation. TYPE I FUEL ASSEMBLIES and TYPE II FUEL ASSEMBLIES will be stored as shown in Figure 3.9-2

New

NEW

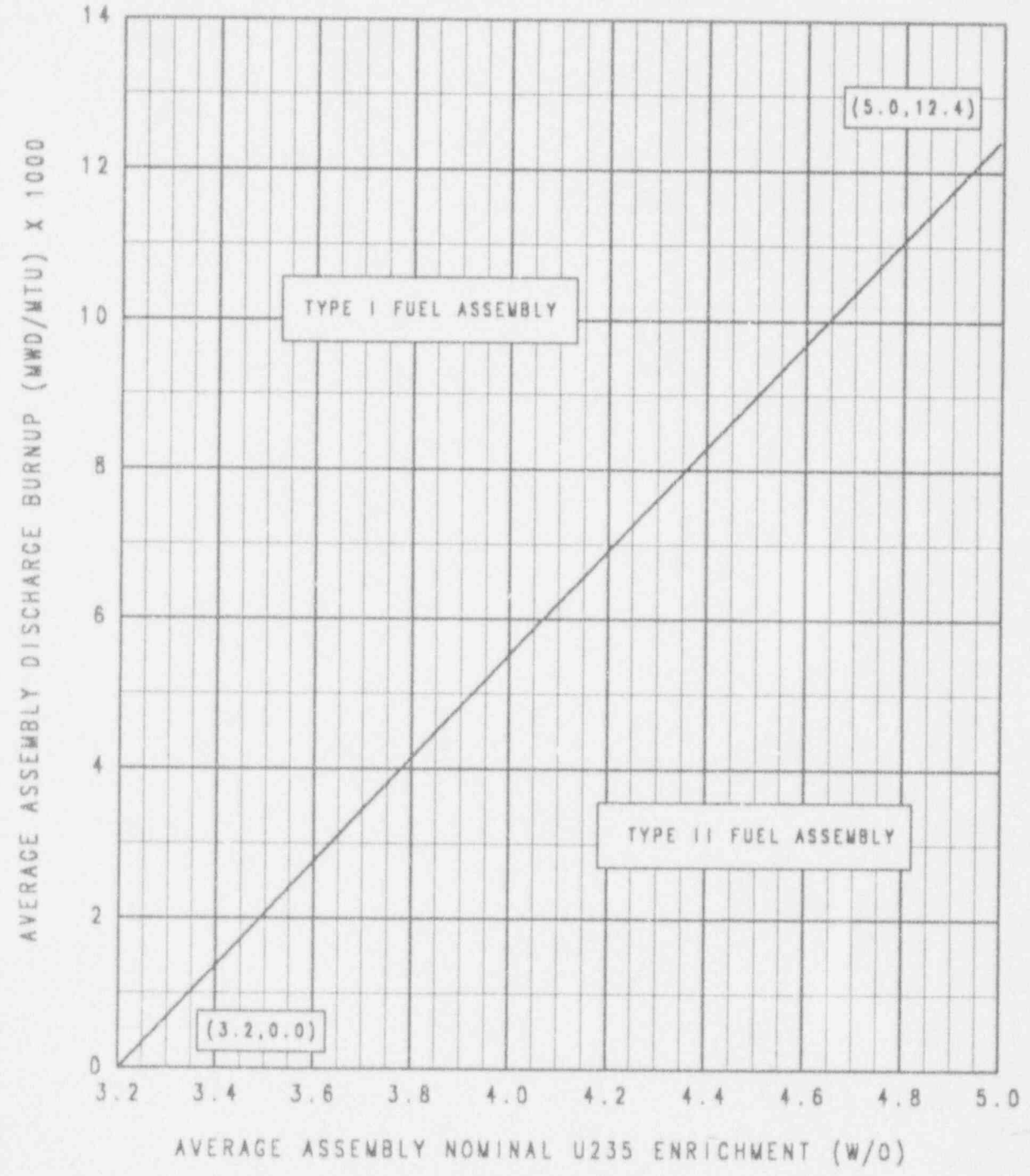


FIGURE 3.9-1 SPENT FUEL POOL RACK MINIMUM BURNUP REQUIREMENTS FOR ALTERNATING ROWS STORAGE CONFIGURATION

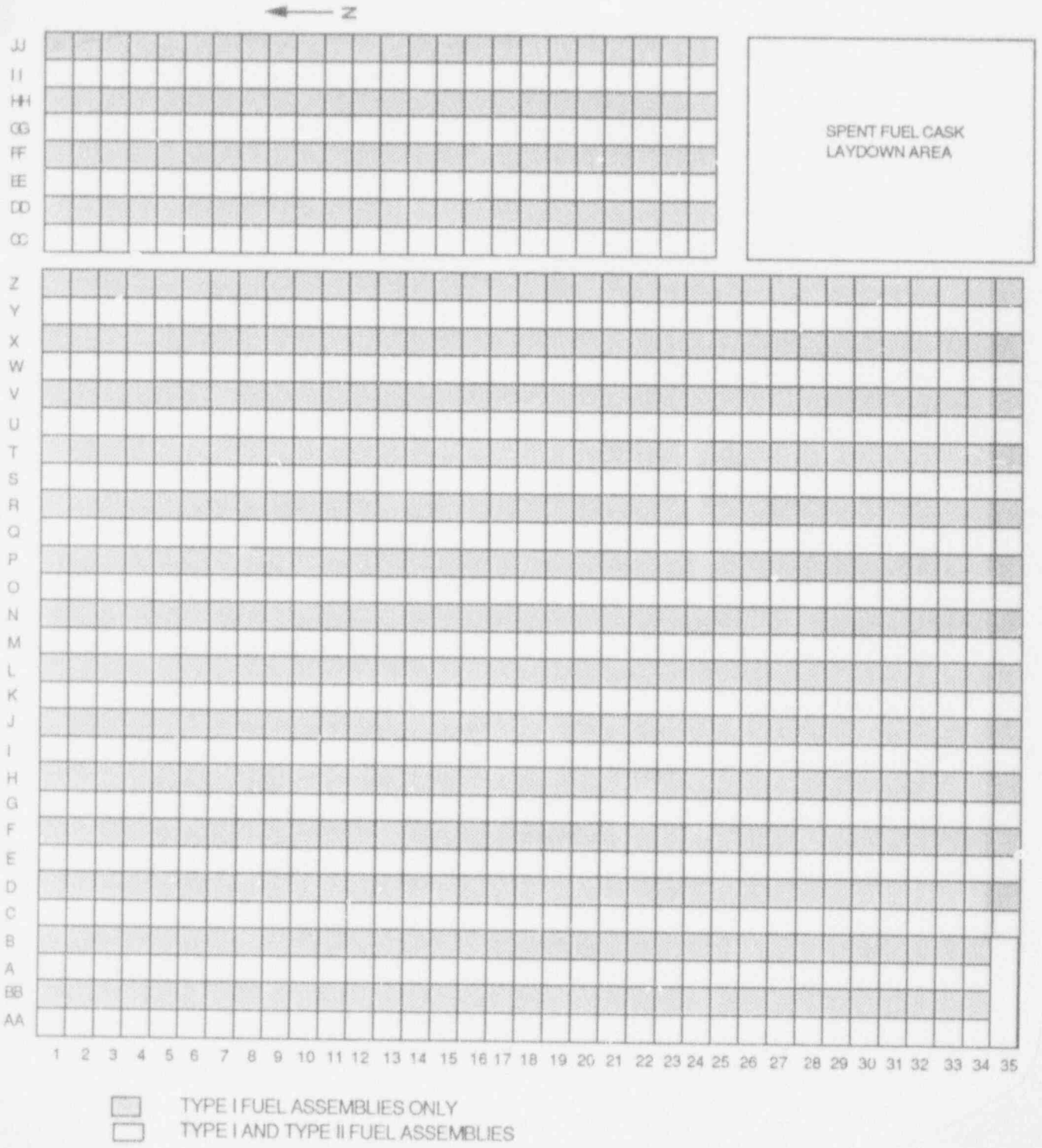
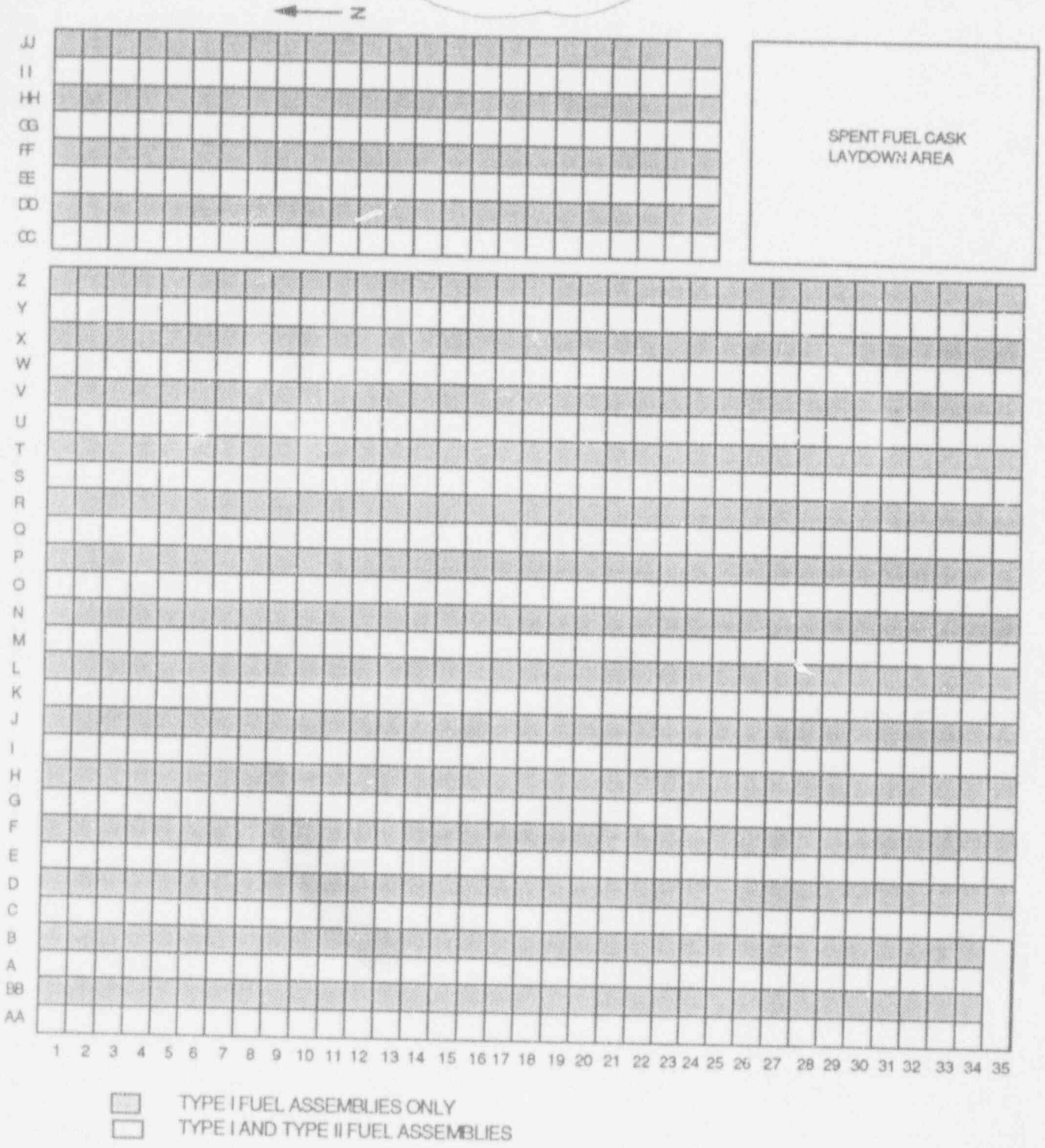


FIGURE 3.9-2 SPENT FUEL POOL RACK ALTERNATING ROW STORAGE CONFIGURATION

NEW



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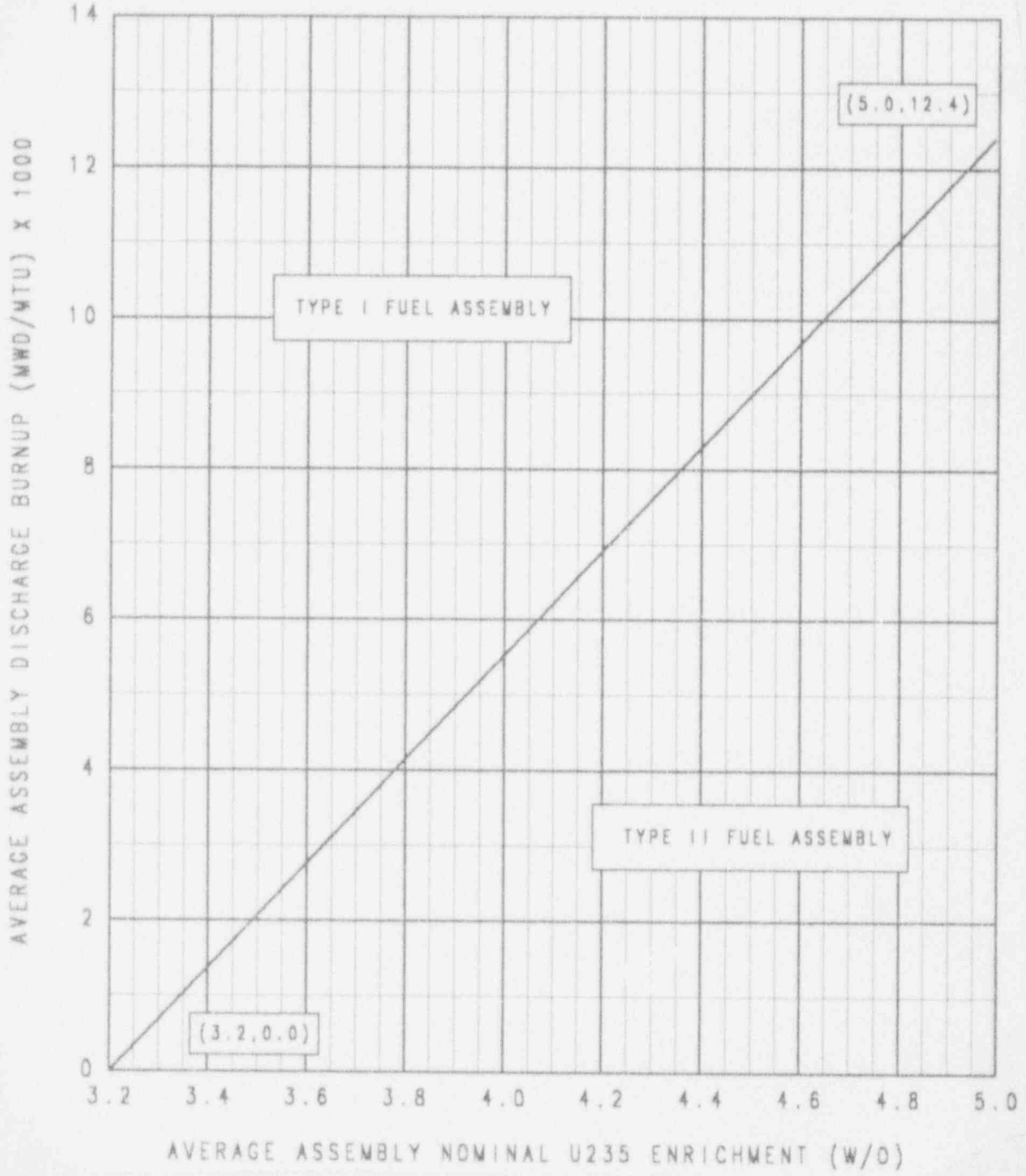


FIGURE 3.9-1 SPENT FUEL POOL RACK MINIMUM BURNUP REQUIREMENTS FOR ALTERNATING ROWS STORAGE CONFIGURATION

3/4.9.10 and 3/4.9.11 WATER LEVEL - REACTOR VESSEL AND STORAGE POOL

The restrictions on minimum water level ensure that sufficient water depth is available to remove 99% of the assumed 10% iodine gap activity released from the rupture of an irradiated fuel assembly. The minimum water depth is consistent with the assumptions of the safety analysis.

3/4.9.12 FUEL STORAGE BUILDING AIR CLEANUP SYSTEM

The limitations on the Fuel Storage Building Air Cleanup System ensure that all radioactive material released from an irradiated fuel assembly will be filtered through the HEPA fiters and charcoal adsorber prior to discharge to the atmosphere. The OPERABILITY of this system and the resulting iodine removal capacity are consistent with the assumptions of the safety analysis. ANSI N510-1980 will be used as a procedural guide for surveillance testing.

3/4.9.13. MOVEMENT OF FUEL IN SPENT FUEL POOL

THE LIMITATIONS OF THIS SPECIFICATION ENSURES THAT, IN THE EVENT OF ANY FUEL HANDLING ACCIDENT IN THE SPENT FUEL POOL, K_{eff} WILL REMAIN ≤ 0.95.

3/4.9.14 SPENT FUEL POOL - REACTIVITY CONDITION

THE LIMITATIONS DESCRIBED BY FIGURES 3.9-1 AND 3.9-2 ENSURE THAT THE REACTIVITY OF FUEL ASSEMBLIES INTRODUCED INTO THE SPENT FUEL RACKS, ARE CONSERVATIVELY WITHIN THE ASSUMPTIONS OF THE SAFETY ANALYSIS.

5.6 FUEL STORAGE

5.6.1 CRITICALITY

SPENT FUEL

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

a. A nominal 10.75 inch center-to-center distance including neutron absorber surrounding each assembly to ensure a K_{eff} less than or equal to 0.95 when flooded with unborated water, and

b. ~~A maximum fuel enrichment to be stored in the fuel pool will be a nominal 4.00 weight percent U-235 for stainless steel clad fuel assemblies and a nominal 3.90 weight percent for Zircaloy-4 clad fuel assemblies.~~ FUEL ASSEMBLIES WILL BE STORED IN AN ALTERNATING NEW CONFIGURATION. TYPE I AND TYPE II FUEL ASSEMBLIES WILL BE STORED IN ACCORDANCE WITH THE REQUIREMENTS OF SPECIFICATION 3.9.14.

NEW FUEL

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

a. A nominal 18.625-inch center-to-center distance with ~~or without~~ a full-length polyvinyl chloride liner to ensure a K_{eff} less than or equal to 0.95 when flooded with unborated water and less than or equal to 0.98 assuming optimum moderating conditions, and

b. ~~A maximum fuel enrichment in the new fuel storage racks will be a nominal 4.00 weight percent U-235 for stainless steel clad fuel assemblies and a nominal 3.90 weight percent U-235 for Zircaloy-4 clad fuel assemblies.~~ THE MAXIMUM FUEL ASSEMBLY ENRICHMENT IN THE NEW FUEL STORAGE RACKS WILL BE 5.0 WEIGHT PERCENT U-235 (NOMINAL). NEW FUEL ASSEMBLIES WITH AN AVERAGE ENRICHMENT GREATER THAN 4.60 WEIGHT PERCENT U-235 (NOMINAL) MUST CONTAIN INTEGRAL FUEL BURNABLE ABSORBERS (IFBA'S) RODS IN ACCORDANCE WITH THE REQUIREMENTS OF FIGURE 5.6-1. NEW FUEL ASSEMBLIES WILL BE STORED IN ACCORDANCE WITH THE REQUIREMENTS OF FIGURE 5.6-2.

DRAINAGE

5.6.2 The spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 27.0 feet MSL.

CAPACITY

5.6.3 The spent fuel storage pool is designed and shall be maintained with a storage capacity limited to no more than 1168 fuel assemblies.

5.7 REACTOR VESSEL DESIGN TRANSIENTS

5.7.1 The reactor vessel design transients are as identified in Table 5.7-1. The transient description followed by the number of design cycles is provided.

New

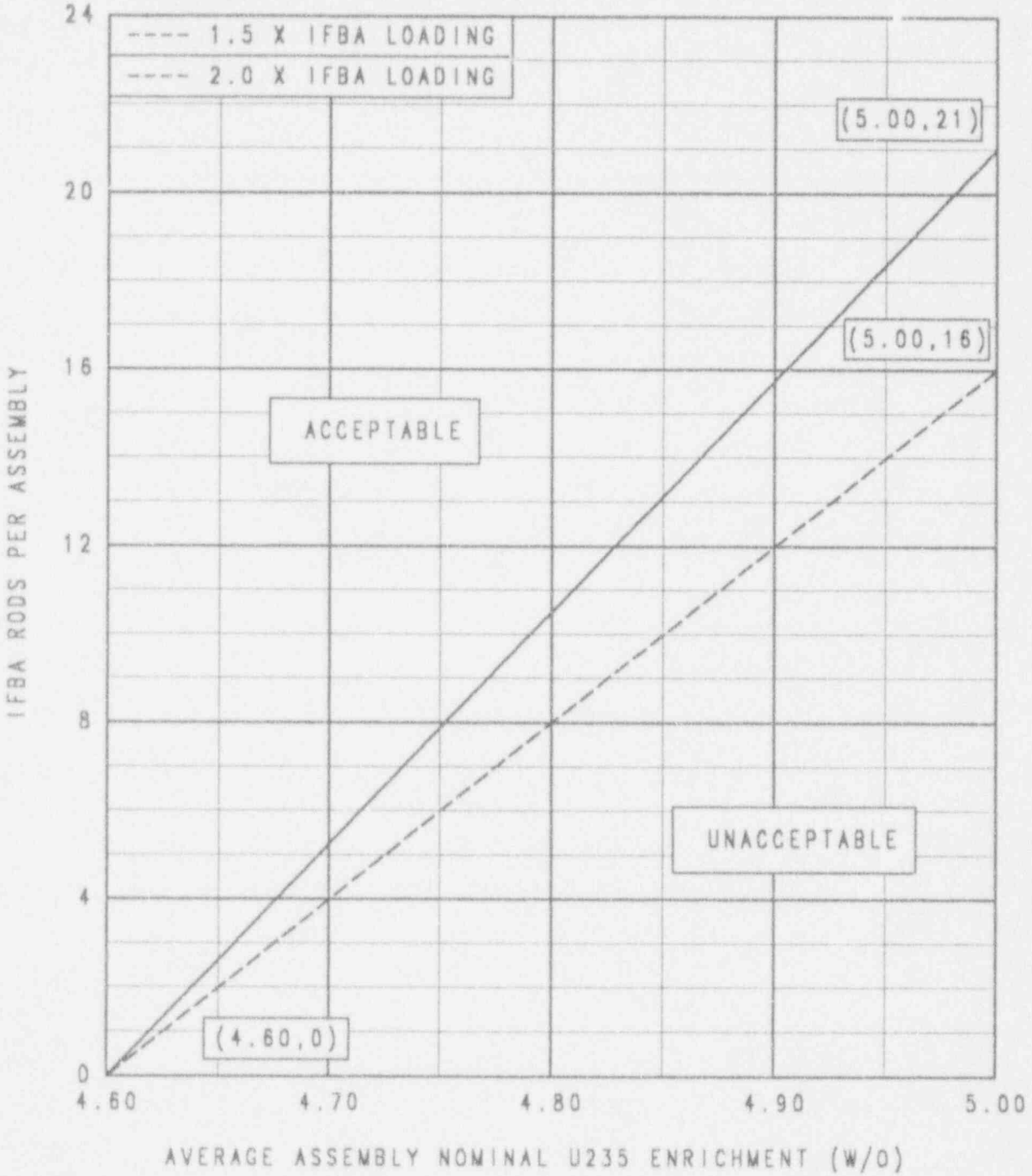
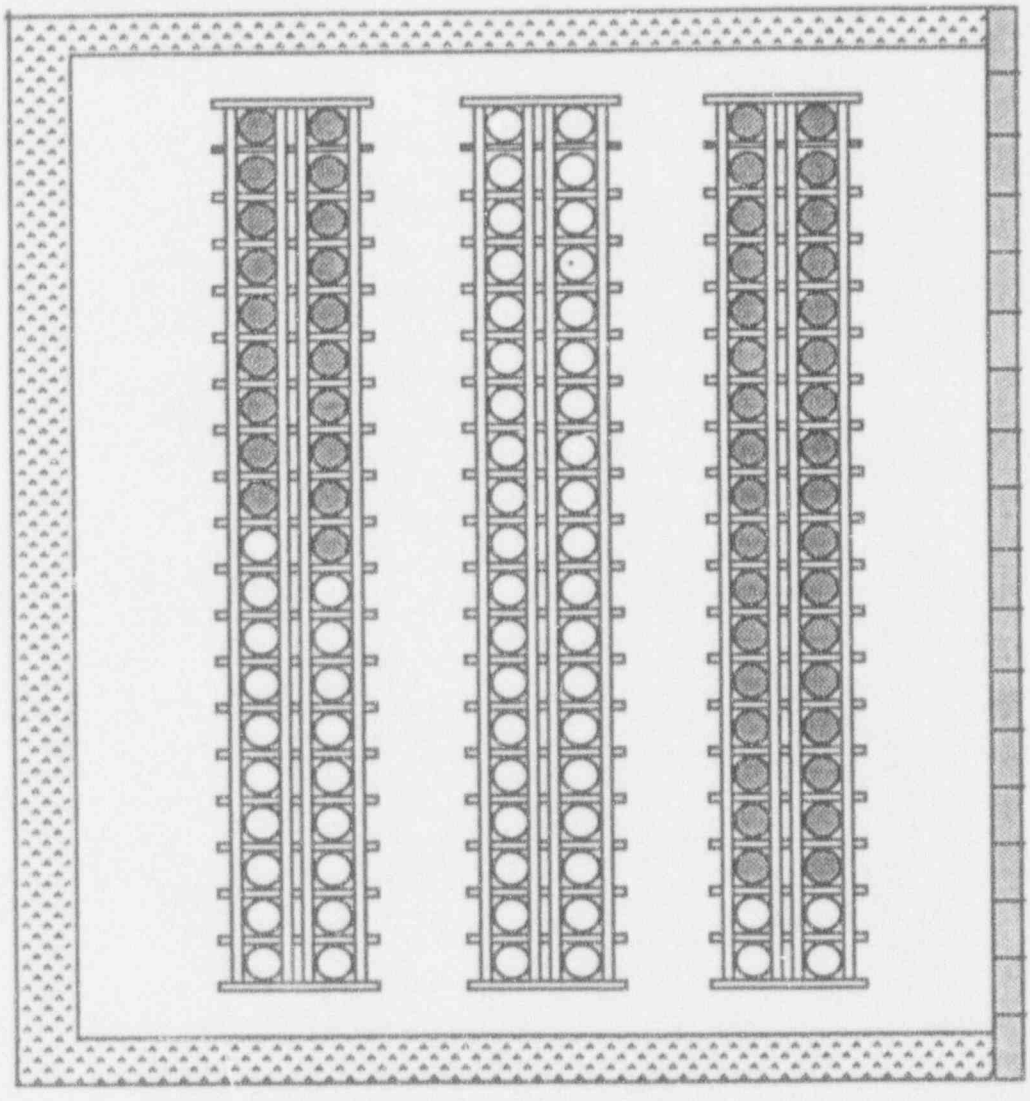


FIGURE 5.6-1 NEW FUEL STORAGE RACK MINIMUM IFBA REQUIREMENTS

NEW



● - UNAVAILABLE FOR NEW FUEL

○ - AVAILABLE FOR NEW FUEL

FIGURE 5.6-2 NEW FUEL STORAGE RACK ARRAY LAYOUT

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Attachment 2

Haddam Neck Plant

Administrative Changes - Spent Fuel Pool and New Fuel
Storage Racks - Retyped Pages of Technical Specifications

January 1994

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1.38 TYPE I FUEL ASSEMBLY is a fuel assembly with an initial average assembly nominal enrichment less than or equal to 3.2 weight percent U-235 or an average assembly burnup/average assembly nominal enrichment as shown in Figure 3.9-1. This definition applies to all fuel types (e.g., stainless steel or zircaloy cladding, stainless steel or zircaloy skeleton).

1.39 TYPE II FUEL ASSEMBLY is a fuel assembly with an initial average assembly nominal enrichment greater than 3.2 weight percent U-235 and an average assembly burnup/average assembly nominal enrichment as shown in Figure 3.9-1. This definition applies to all fuel types (e.g., stainless steel or zircaloy cladding, stainless steel or zircaloy skeleton).

REFUELING OPERATIONS

3/4.9.13 MOVEMENT OF FUEL IN SPENT FUEL POOL

LIMITING CONDITION FOR OPERATION

3.9.13 Prior to movement of a fuel assembly in the spent fuel pool, the boron concentration of the pool shall be maintained uniform and sufficient to maintain a boron concentration of greater than or equal to 800 ppm.

APPLICABILITY: Whenever a fuel assembly is moved in the spent fuel pool.

ACTION:

With the boron concentration less than 800 ppm, suspend the movement of all fuel in the spent fuel pool.

SURVEILLANCE REQUIREMENT

4.9.13 Verify that the boron concentration is greater than or equal to 800 ppm within 24 hours prior to any movement of a fuel assembly in the spent fuel pool and every 72 hours thereafter.

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APPLICABILITY: Whenever fuel is in the spent fuel pool.

ACTION:

Borate until $K_{eff} \leq .95$ is reached.

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4.9.14 Ensure that all fuel assemblies to be placed in the spent fuel pool are within the enrichment and burn-up limits of Figure 3.9-1 by checking the assembly's design and burn-up documentation. TYPE I FUEL ASSEMBLIES and TYPE II FUEL ASSEMBLIES will be stored as shown in Figure 3.9-2

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The restrictions on minimum water level ensure that sufficient water depth is available to remove 99% of the assumed 10% iodine gap activity released from the rupture of an irradiated fuel assembly. The minimum water depth is consistent with the assumptions of the safety analysis.

3/4.9.12 FUEL STORAGE BUILDING AIR CLEANUP SYSTEM

The limitations on the Fuel Storage Building Air Cleanup System ensure that all radioactive material released from an irradiated fuel assembly will be filtered through the HEPA fiters and charcoal adsorber prior to discharge to the atmosphere. The OPERABILITY of this system and the resulting iodine removal capacity are consistent with the assumptions of the safety analysis. ANSI N510-1980 will be used as a procedural guide for surveillance testing.

3/4.9.13 MOVEMENT OF FUEL IN SPENT FUEL POOL

The limitations of this specification ensure that, in the event of any fuel handling accident in the spent fuel pool, K_{eff} will remain ≤ 0.95.

3/4.9.14 SPENT FUEL POOL - REACTIVITY CONDITION

The limitations described by Figures 3.9-1 and 3.9-2 ensure that the reactivity of fuel assemblies introduced into the spent fuel racks, are conservatively within the assumptions of the safety analysis.

5.6 FUEL STORAGE

5.6.1 CRITICALITY

SPENT FUEL

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

a. A nominal 10.75 inch center-to-center distance including neutron absorber surrounding each assembly to ensure a K_{eff} less than or equal to 0.95 when flooded with unborated water, and

b. Fuel assemblies will be stored in an alternating row configuration. TYPE I and TYPE II FUEL ASSEMBLIES will be stored in accordance with the requirements of Specification 3.9.14.

NEW FUEL

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

a. A nominal 18.625-inch center-to-center distance with a full-length polyvinyl chloride liner to ensure a K_{eff} less than or equal to 0.95 when flooded with unborated water and less than or equal to 0.98 assuming optimum moderating conditions, and

b. The maximum fuel assembly enrichment in the new fuel storage racks will be 5.0 weight percent U-235 (nominal). New fuel assemblies with an average enrichment greater than 4.60 weight percent U-235 (nominal) must contain Integral Fuel Burnable Absorbers (IFBA) rods in accordance with the requirements of Figure 5.6-1. New fuel assemblies will be stored in accordance with the requirements of Figure 5.6-2.

DRAINAGE

5.6.2 The spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 27.0 feet MSL.

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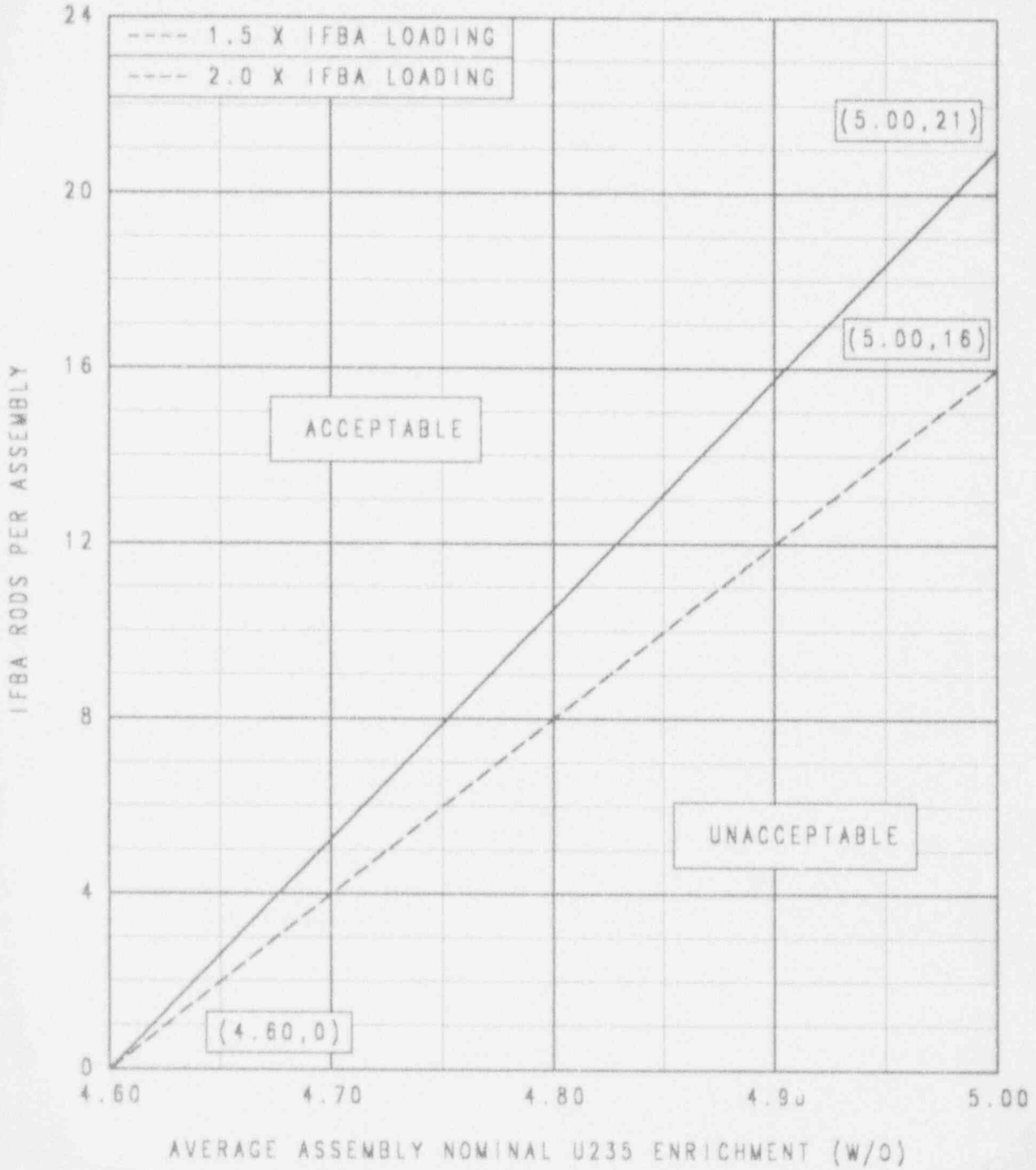
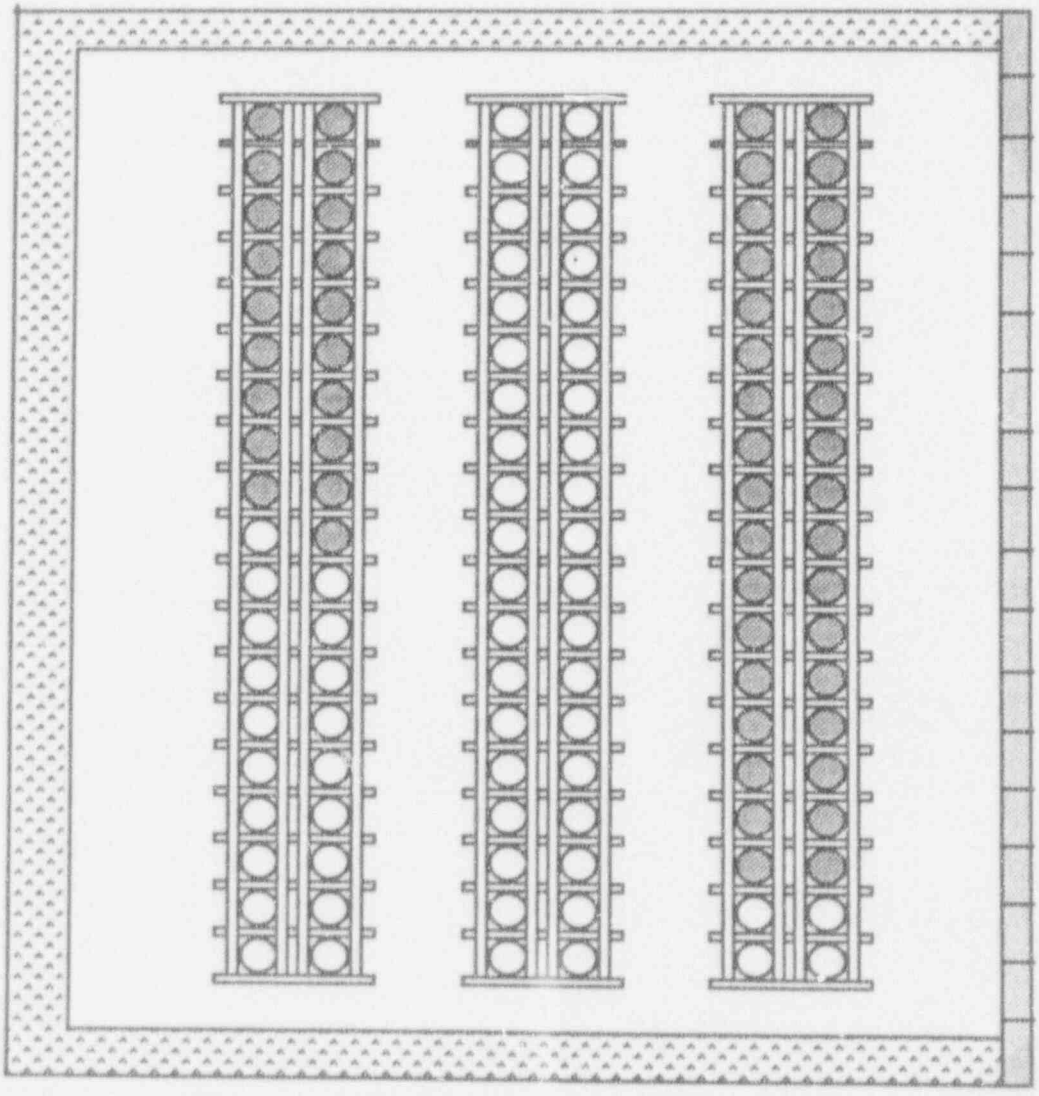


FIGURE 5.6-1 NEW FUEL STORAGE RACK MINIMUM IFBA REQUIREMENTS



● - UNAVAILABLE FOR NEW FUEL

○ - AVAILABLE FOR NEW FUEL

FIGURE 5.6-2 NEW FUEL STORAGE RACK ARRAY LAYOUT

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Attachment 3

Haddam Neck Plant

Criticality Analysis of the Connecticut Yankee
Fresh and Spent Fuel Racks

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