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### LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

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## REFUELING OPERATIONS

### SPENT FUEL POOL BORON CONCENTRATION

#### LIMITING CONDITION FOR OPERATION

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3.9.17 The boron concentration in the spent fuel pool shall be greater than or equal to 1720 parts per million (ppm).

APPLICABILITY: Whenever any fuel assembly or consolidated fuel storage box is stored in the spent fuel pool.

#### ACTION:

With the boron concentration less than 1720 ppm, suspend the movement of all fuel, consolidated fuel storage boxes, and shielded casks, and immediately initiate action to restore the spent fuel pool boron concentration to within its limit.

The provisions of specification 3.0.3 are not applicable.

#### SURVEILLANCE REQUIREMENTS

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4.9.17 Verify that the boron concentration is greater than or equal to 1720 ppm every 7 days, and within 24 hours prior to the initial movement of a fuel assembly or consolidated fuel storage box in the Spent Fuel Pool, or shielded cask over the cask laydown area.

## REFUELING OPERATIONS

### SPENT FUEL POOL-STORAGE

#### LIMITING CONDITION FOR OPERATION

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- 3.9.18 The following spent fuel pool storage requirement will be met:
- (a) The combination of initial enrichment and burnup of each fuel assembly stored in Region A shall be within the acceptable burnup domain of Figure 3.9-4; and
  - (b)(1) The combination of initial enrichment and burnup of a fuel assembly stored in Region C shall be within the acceptable burnup domain of Figure 3.9-1A;  
  
OR
  - (2) The combination of initial enrichment and burnup of a fuel assembly stored in Region C shall be within the acceptable burnup domain of Figure 3.9-1B, and borated stainless steel poison pins are installed in the assembly's center guide tube and in two diagonally opposite guide tubes; and
  - (c) The combination of initial enrichment and burnup of each consolidated fuel storage box stored in Region C shall be within the acceptable burnup domain of Figure 3.9-3.

APPLICABILITY: Whenever any fuel assembly or consolidated fuel storage box is stored in the spent fuel pool.

#### ACTION:

Immediately initiate action to move the non-complying fuel assembly or consolidated fuel storage box to an acceptable location.

The provisions of specification 3.0.3 are not applicable.

#### SURVEILLANCE REQUIREMENTS

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4.9.18 Prior to storing a fuel assembly or consolidated fuel storage box in the spent fuel racks, verify by administrative means the initial enrichment and burnup of the fuel assembly or consolidated fuel storage box is in accordance with the acceptable specifications for that Storage Region.

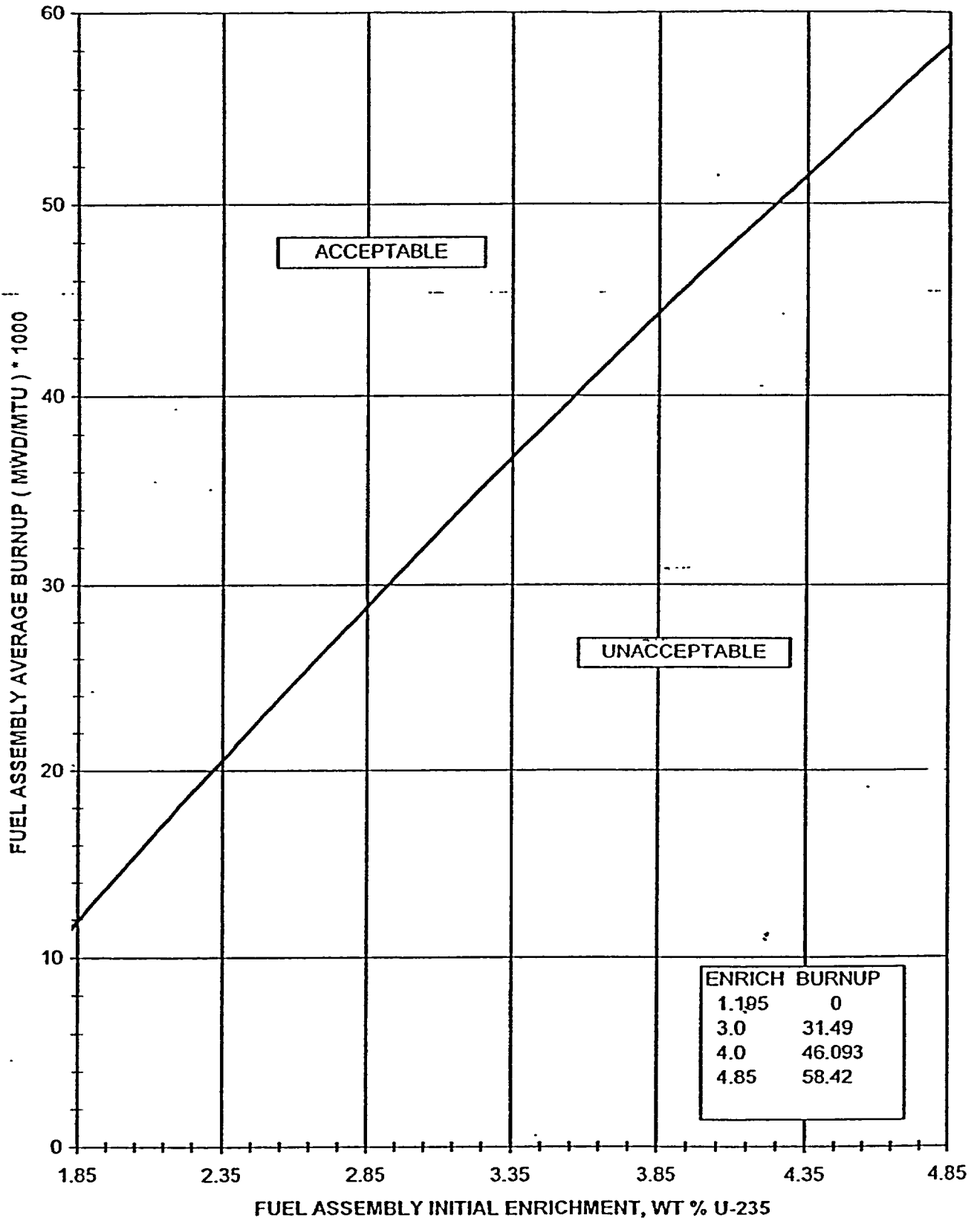


FIGURE 3.9-1A MINIMUM REQUIRED FUEL ASSEMBLY EXPOSURE AS A FUNCTION OF INITIAL ENRICHMENT TO PERMIT STORAGE IN REGION C

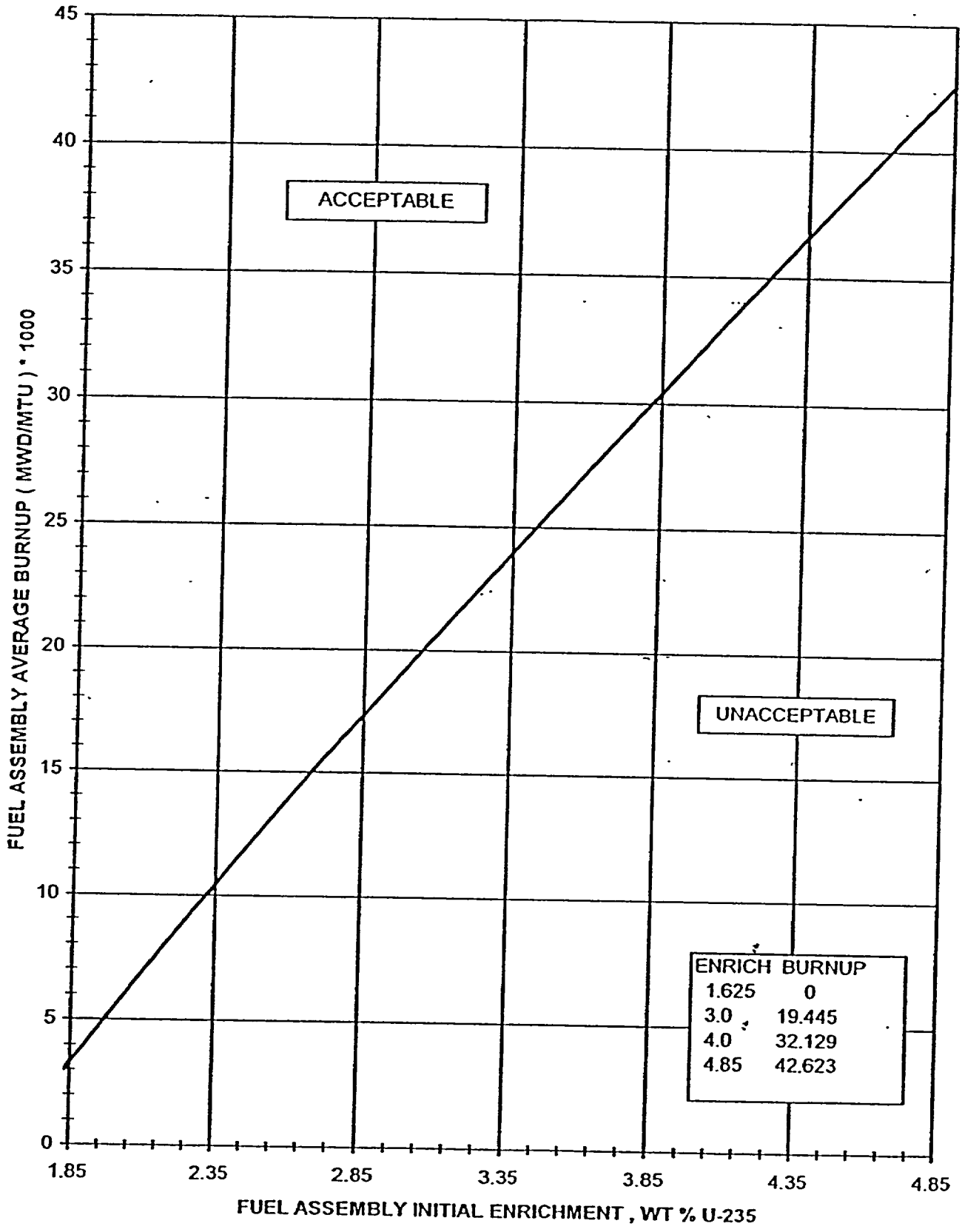
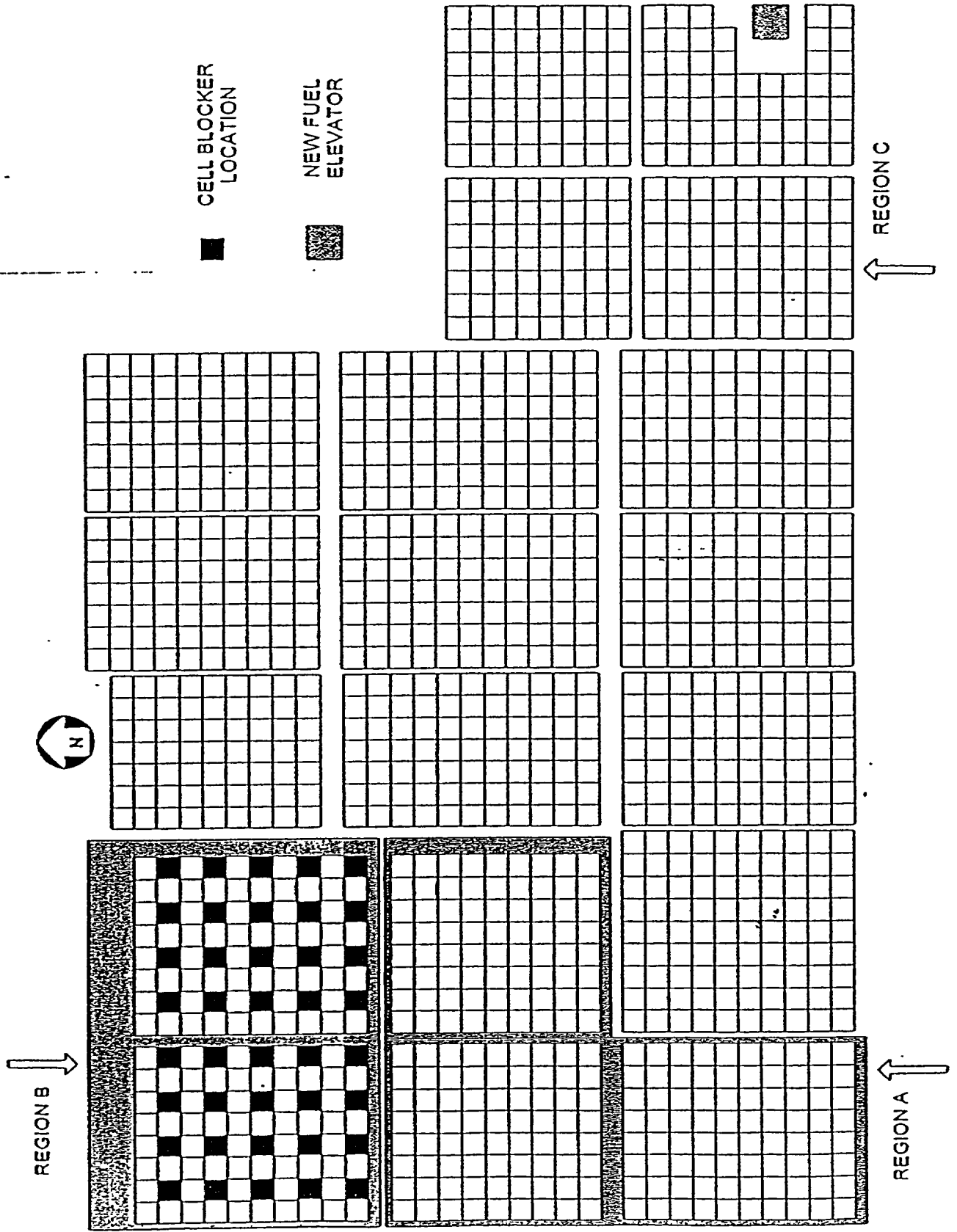


FIGURE 3.9-1B MINIMUM REQUIRED FUEL ASSEMBLY EXPOSURE AS A FUNCTION OF INITIAL ENRICHMENT TO PERMIT STORAGE IN REGION C WITH POISON PINS INSTALLED

SPENT FUEL POOL ARRANGEMENT  
 FIGURE 3.9-2  
 (NOT TO SCALE)





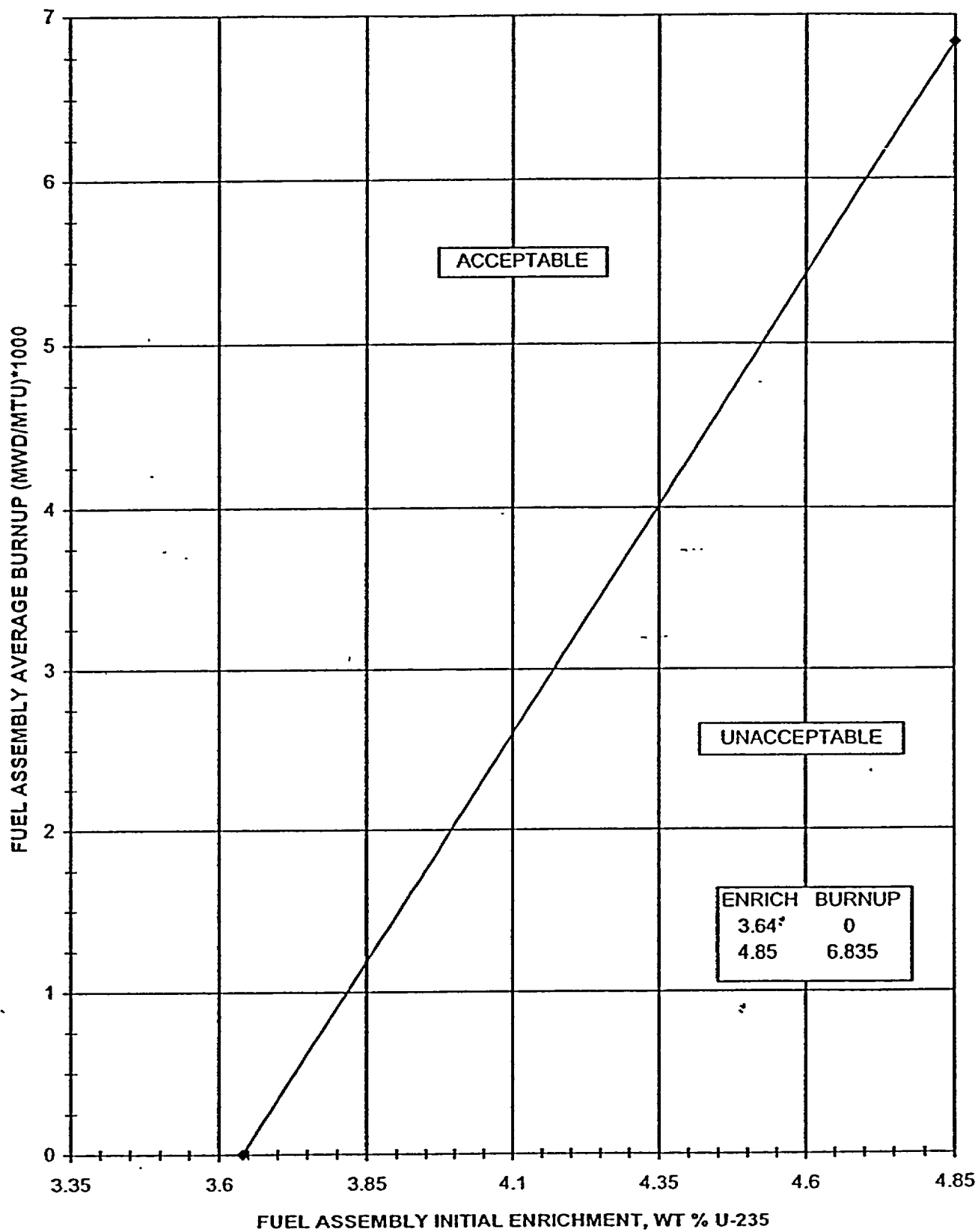


FIGURE 3.9-4 MINIMUM REQUIRED FUEL ASSEMBLY EXPOSURE AS A FUNCTION OF INITIAL ENRICHMENT TO PERMIT STORAGE IN REGION A

## REFUELING OPERATIONS

### SPENT FUEL POOL - STORAGE PATTERN

#### LIMITING CONDITION FOR OPERATION

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3.9.19 Each STORAGE PATTERN of the Region B spent fuel pool racks shall require that:

- (1) A cell blocking device is installed in those cell locations shown in Figure 3.9-2. The blocked location may store a Batch B fuel assembly\* underneath the cell blocker; or
- (2) If a cell blocking device has been removed, all cells in the STORAGE PATTERN, except the location with the removed cell blocking device, must be vacant of stored fuel assemblies.

APPLICABILITY: Fuel in the spent fuel pool.\*\*

#### ACTION:

Take immediate action to comply with either 3.9.19(1) or (2).

The provisions of specification 3.0.3 are not applicable.

#### SURVEILLANCE REQUIREMENTS

4.9.19 Verify that 3.9.19 is satisfied prior to removing a cell blocking device.

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\*A Batch B fuel assembly refers to any of the Batch B fuel assemblies which were part of the first Millstone 2 core.

\*\*This LCO is not applicable during the initial installation of Batch B fuel assemblies in the cell blocker locations.

## REFUELING OPERATIONS

### BASES (Continued)

adsorber sample for laboratory testing if the integrity of the adsorber section is affected, and (4) following painting, fire, or chemical release in any ventilation zone communicating with the system.

#### 3/4.9.16 SHIELDED CASK

The limitations of this specification and 3/4.9.15 ensure that in the event of a shielded cask drop accident the doses from ruptured fuel assemblies will be within the assumptions of the safety analyses.

#### 3/4.9.17 SPENT FUEL POOL BORON CONCENTRATION

The limitations of this specification ensures that sufficient boron is present to maintain spent fuel pool  $K_{eff} \leq 0.95$  under accident conditions.

Postulated accident conditions which could cause an increase in spent fuel pool reactivity are: a single dropped or mis-loaded fuel assembly, a single dropped or mis-loaded Consolidated Fuel Storage Box, or a shielded cask drop onto the storage racks. A spent fuel pool soluble boron concentration of 1400 ppm is sufficient to ensure  $K_{eff} \leq 0.95$  under these postulated accident conditions. The required spent fuel pool soluble boron concentration of  $\geq 1720$  ppm conservatively bounds the required 1400 ppm. The ACTION statement ensure that if the soluble boron concentration falls below the required amount, that fuel movement or shielded cask movement is stopped, until the boron concentration is restored to within limits.

An additional basis of this LCO is to establish 1720 ppm as the minimum spent fuel pool soluble boron concentration which is sufficient to ensure that the design basis value of 600 ppm soluble boron is not reached due to a postulated spent fuel pool boron dilution event. As part of the spent fuel pool criticality design, a spent fuel pool soluble boron concentration of 600 ppm is sufficient to ensure  $K_{eff} \leq 0.95$ , provided all fuel is stored consistent with LCO requirements. By maintaining the spent fuel pool soluble boron concentration  $\geq 1720$  ppm, sufficient time is provided to allow the operators to detect a boron dilution event, and terminate the event, prior to the spent fuel pool being diluted below 600 ppm. In the unlikely event that the spent fuel pool soluble boron concentration is decreased to 0 ppm,  $K_{eff}$  will be maintained  $< 1.00$ , provided all fuel is stored consistent with LCO requirements. The ACTION statement ensures that if the soluble boron concentration falls below the required amount, that immediate action is taken to restore the soluble boron concentration to within limits, and that fuel movement or shielded cask movement is stopped. Fuel movement and shielded cask movement is stopped to prevent the possibility of creating an accident condition at the same time that the minimum soluble boron is below limits for a potential boron dilution event.

The surveillance of the spent fuel pool boron concentration within 24 hours of fuel movement, consolidated fuel movement, or cask movement over the cask layout area, verifies that the boron concentration is within limits just prior to the movement. The 7 day surveillance interval frequency is sufficient since no deliberate major replenishment of pool water is expected to take place over this short period of time.

## REFUELING OPERATIONS

### BASES

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#### 3/4.9.18 SPENT FUEL POOL - STORAGE

The limitations described by Figures 3.9-1a, 3.9-1b, and 3.9-3 ensure that the reactivity of fuel assemblies and consolidated fuel storage boxes, introduced into the Region C spent fuel racks, are conservatively within the assumptions of the safety analysis.

The limitations described by Figure 3.9-4 ensure that the reactivity of the fuel assemblies, introduced into the Region A spent fuel racks, are conservatively within the assumptions of the safety analysis.

#### 3/4.9.19 SPENT FUEL POOL - STORAGE PATTERN

The limitations of this specification ensure that the reactivity condition of the Region B storage racks and spent fuel pool  $K_{eff}$  will remain less than or equal to 0.95.

The Cell Blocking Devices in the 4th location of the Region B storage racks are designed to prevent inadvertent placement and/or storage in the blocked locations. The blocked location remains empty, or a Batch B fuel assembly may be stored in the blocked location, to maintain reactivity control for fuel assembly storage in any adjacent locations. Region B (non-cell blocker locations) is designed for the storage of new assemblies in the spent fuel pool, and for fuel assemblies which have not sustained sufficient burnup to be stored in Region A or Region C.

This LCO is not applicable during the initial installation of Batch B fuel assemblies in the cell blocker locations of Region B. This is acceptable because only Batch B fuel assemblies will be moved during the initial installation of Batch B fuel assemblies under the Region B cell blockers. Batch B fuel assemblies are qualified for storage in any spent fuel pool storage rack location, hence a fuel misloading event which causes a reactivity consequence is not credible. This exception is valid only during the initial installation of Batch B fuel assemblies in the cell blocker locations.

#### 3/4.9.20 SPENT FUEL POOL - CONSOLIDATION

The limitations of these specifications ensure that the decay heat rates and radioactive inventory of the candidate fuel assemblies for consolidation are conservatively within the assumptions of the safety analysis.

## DESIGN FEATURES

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### 5.3 REACTOR CORE

#### FUEL ASSEMBLIES

5.3.1 The reactor core shall contain 217 fuel assemblies with each fuel assembly containing 176 rods. Reload fuel shall be similar in physical design to the initial core loading and shall have a maximum nominal average enrichment of 4.85 weight percent of U-235. A fuel rod shall have a maximum enrichment of 5.0 weight percent of U-235.

#### CONTROL ELEMENT ASSEMBLIES

5.3.2 The reactor core shall contain 73 full length and no part length control element assemblies. The control element assemblies shall be designed and maintained in accordance with the design provisions contained in Section 3.0 of the FSAR with allowance for normal degradation pursuant to the applicable Surveillance Requirements.

### 5.4 DELETED

## DESIGN FEATURES

### 5.5 DELETED

### 5.6 FUEL STORAGE

#### CRITICALITY

5.6.1 a) The new fuel (dry) storage racks are designed and shall be maintained with sufficient center to center distance between assemblies to ensure a  $k_{eff} \leq .95$ . The maximum nominal average fuel assembly enrichment to be stored in these racks is 4.85 weight percent U-235. The maximum fuel rod enrichment to be stored in these racks is 5.0 weight percent U-235.

b) The spent fuel storage racks are designed and shall be maintained with fuel assemblies having a maximum nominal average enrichment of 4.85 weight percent U-235. The maximum fuel rod enrichment to be stored in these racks is 5.0 weight percent U-235.

c) The spent fuel storage racks are designed and shall be maintained with  $K_{eff} < 1.00$  if fully flooded with unborated water, which includes an allowance for uncertainties as described in Westinghouse Report A-MP-FE-0011, Revision 1, "Millstone Unit 2 Spent Fuel Pool Criticality Analysis with Soluble Boron Credit."

d) The spent fuel storage racks are designed and shall be maintained with  $K_{eff} \leq .95$  if fully flooded with water borated to 600 ppm, which includes an allowance for uncertainties as described in Westinghouse Report A-MP-FE-0011, Revision 1, "Millstone Unit 2 Spent Fuel Pool Criticality Analysis with Soluble Boron Credit."

e) Region A of the spent fuel storage pool is designed and shall be maintained with a nominal 9.8 inch center to center distance between storage locations. Fuel assemblies stored in this region must comply with Figure 3.9-4 to ensure that the design burnup has been sustained.

f) Region B of the spent fuel storage pool is designed and shall be maintained with a nominal 9.8 inch center to center distance between storage locations. Region B contains both blocked and un-blocked storage locations, shown in Figure 3.9-2. Fuel having a maximum nominal enrichment of 4.85 weight percent U-235, may be stored in un-blocked locations. Fuel stored in blocked locations must be Batch B fuel assemblies.

g) Region C of the spent fuel storage pool is designed and shall be maintained with a 9.0 inch center to center distance between storage locations. Fuel assemblies stored in this region must comply with Figures 3.9-1a or 3.9-1b to ensure that the design burn-up has been sustained. Additionally, fuel assemblies utilizing Figure 3.9-1b require that borated stainless steel poison pins are installed in the fuel assembly's center guide tube and in two diagonally opposite guide tubes. The poison pins are solid 0.87 inch O.D. borated stainless steel, with a boron content of 2 weight percent boron.

h) Region C of the spent fuel storage pool is designed to permit storage of consolidated fuel. The contents of the consolidated fuel storage boxes to be stored in this region must comply with Figure 3.9-3 to ensure that the design burnup has been sustained.

## DESIGN FEATURES

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### DRAINAGE

5.6.2 The spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 22'6".

### CAPACITY

5.6.3 The spent fuel storage pool is designed and shall be maintained with a storage capacity limited to no more than 224 storage locations in Region A, 160 storage locations in Region B and 962 storage locations in Region C for a total of 1346 storage locations.