Progress Energy

DEC 2 2 2005

Serial: HNP-05-143
10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
SUPPLEMENT TO REQUEST FOR LICENSE AMENDMENT
TO CREDIT SOLUBLE BORON FOR FUEL STORAGE POOLS

Ladies and Gentlemen:

In a letter dated September 1, 2005 (i.e., Serial: HNP-05-103), Carolina Power and Light Company (CP&L) doing business as Progress Energy Carolinas, Inc., requested a license amendment to the Technical Specifications (TS) of the Harris Nuclear Plant (HNP). The proposed amendment would modify the TS requirements for Pressurized-Water Reactor (PWR) Boraflex fuel storage racks and add TS requirements for fuel storage pool boron concentration.

This letter provides revised Attachments 3 and 4 due to inadvertently omitting unchanged text that had rolled onto another page and associated changes to the index. For clarity, these attachments replace Attachments 3 and 4 of the original letter in their entirety.

The administrative revision provided by this submittal does not change the intent or the justification for the requested amendment. HNP has determined that this supplement did not result in any change to the No Significant Hazards Consideration contained in the original letter. Therefore, the 10 CFR 50.92 Evaluation provided in the September 1, 2005 submittal and published in the Federal Register (i.e., 70 FR 67746 dated November 8, 2005) remains valid.

HNP requests that the proposed amendment be issued prior to March 20, 2006 to support HNP Refueling Outage (RFO)-13, which is scheduled for April 8, 2006.

In addition, this document contains no new or revised Regulatory Commitments.

Please refer any question regarding this submittal to Mr. Dave Corlett at (919) 362-3137.

Progress Energy Carolinas, Inc.
Harris Nuclear Plant
P.O. Box 165
New Hill, NC 27562

A001

I declare, under penalty of perjury, that the attached information is true and correct (Executed on DEC 2 2 2005).

Sincerely,

C.S. Kamilaris

C. S. Kamilaris
Manager, Support Services
Harris Nuclear Plant

CSK/jpy

Attachments:

3. Proposed Technical Specifications (TS) Changes
4. Revised Technical Specifications (TS) Pages

c:
Mr. R. A. Musser, NRC Senior Resident Inspector
Ms. B. O. Hall, N.C. DENR Section Chief
Mr. C. P. Patel, NRC Project Manager
Dr. W. D. Travers, NRC Regional Administrator

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
SUPPLEMENT TO REQUEST FOR LICENSE AMENDMENT
PROPOSED TECHNICAL SPECIFICATIONS (TS) CHANGES

PROPOSED TECHNICAL SPECIFICATIONS (TS) CHANGES

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TABLE 5.7-1 COMPONENT CYCLIC OR TRANSIENT LIMITS 5-8

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c

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Proposed Text of NEW Technical Specification for spent fuel pool boron.

PLANT SYSTEMS

3/4.7.14 FUEL STORAGE POOL BORON CONCENTRATION

LIMITING CONDITION FOR OPERATION

3.7.14 The boron concentration of spent fuel pools shall be ≥ 2000 ppm.

APPLICABILITY: At ALL TIMES for pools that contain nuclear fuel

ACTION:

1. With the spent fuel pool boron concentration not within the limits, immediately suspend movement of fuel assemblies.

2. Immediately initiate action to restore pool boron concentration within the limit.

SURVEILLANCE REQUIRMENTS

4.7.14 At least once every 7 days verify spent fuel pool boron concentration is within the limit by:

1. Sampling the water volume connected to or in applicable pools.

2. In addition to 4.7.14.1, sampling an individual pool containing nuclear fuel if the pool is isolated from other pools.

5.6 FUEL STORAGE

CRITICALITY

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

(indent) k_{eff} less than or equal to 0.95 when flooded with unborated water, ~~which includes an allowance for uncertainties as described in Section 4.3.2.6 of the FSAR.~~

The reactivity margin is assured for pools "A" and "B" by maintaining:

~~a. A nominal 10.5 inch center-to-center distance between fuel assemblies placed in the flux trap-style PWR storage racks and~~ 6.25 inch center-to-center distance in the BWR storage racks.

~~b. The maximum core geometry K_∞ for PWR fuel assemblies less than or equal to 1.470 at 68°F.~~

The reactivity margin is assured for pools "C" and "D" by maintaining a nominal 9.017 inch center-to-center distance between fuel assemblies placed in the non-flux trap style PWR storage racks and 6.25 inch center to center distance in the BWR storage racks. The following restrictions are also imposed through administrative controls:

1. PWR assemblies must be within the "acceptable range" of the burnup restrictions shown in Figure 5.6-1 prior to storage in Pools "C" or "D".

2. BWR assemblies are acceptable for storage in Pool "C" provided the maximum planar average enrichments are less than 4.6 wt% U235 and K_{inf} is less than or equal to 1.32 for the standard cold core geometry (SCCG).

DRAINAGE

5.6.2 The pools "A", "B", "C" and "D" are designed and shall be maintained to prevent inadvertent draining of the pools below elevation 277.

CAPACITY

5.6.3.a Pool "A" contains six (6 x 10 cell) flux trap type PWR racks and three (11 x 11 cell) BWR racks for a total storage capacity of 723 assemblies. Pool "B" contains six (7 x 10 cell), five (6 x 10 cell), and one (6 x 8 cell) flux trap style PWR racks and seventeen (11 x 11 cell) BWR racks and is licensed for one additional (11 x 11 cell) BWR rack that will be installed as needed. The combined pool "A" and "B" licensed storage capacity is 3669 assemblies.

Technical Specification 5.6.1 INSERT A:

1. PWR storage racks in pools "A" and "B"

    a. k_{eff} less than or equal to 0.95 if fully flooded with water borated to 2000 ppm.
    b. k_{eff} less than 1.0 if flooded with unborated water.
    c. A nominal 10.5 inch center-to-center distance between fuel assemblies.
    d. Assemblies must be within the "acceptable range" of the burnup restrictions shown in Figure 5.6-2 prior to storage in unrestricted storage.
    e. Assemblies that do not meet the requirements of 5.6.1.1.d shall be stored in a 2-of-4 checkerboard within and across rack module boundaries. Less dense storage pattern (e.g. 1-of-4 or 1-of-5) are acceptable in place of 2-of-4.
    f. The empty spaces (water holes) in the 5.6.1.1.e checkerboard may be occupied by non-fuel items (e.g., containment specimen and trash baskets, mock fuel assemblies etc.) up to a limit of one per every 6 storage spaces.
    g. If fuel that meets the requirement of 5.6.1.1.d and fuel that does not meet 5.6.1.1.d are stored in the same rack module, an interface region must exist between the two regions. The interface region shall either be an empty row/column or a row /column of fuel that meets the requirements of 5.6.1.1.d in a checkerboard pattern with the restricted 2-of-4 (5.6.1.1.e) region.

2. Dry New Fuel PWR Storage Racks

    a. Fuel assemblies having a maximum U-235 enrichment of 5.0 weight percent.
    b. $k_{eff} \leq 0.95$ if fully flooded with unborated water without credit for Boraflex in the rack module.
    c. $k_{eff} \leq 0.98$ in an optimum moderation event,
    d. A nominal 10.5 inch center to center distance between storage cells with alternating rows and columns blocked such that fuel is stored in a 1-of-4 pattern.

3. BWR Storage Racks in Pools "A" and "B"

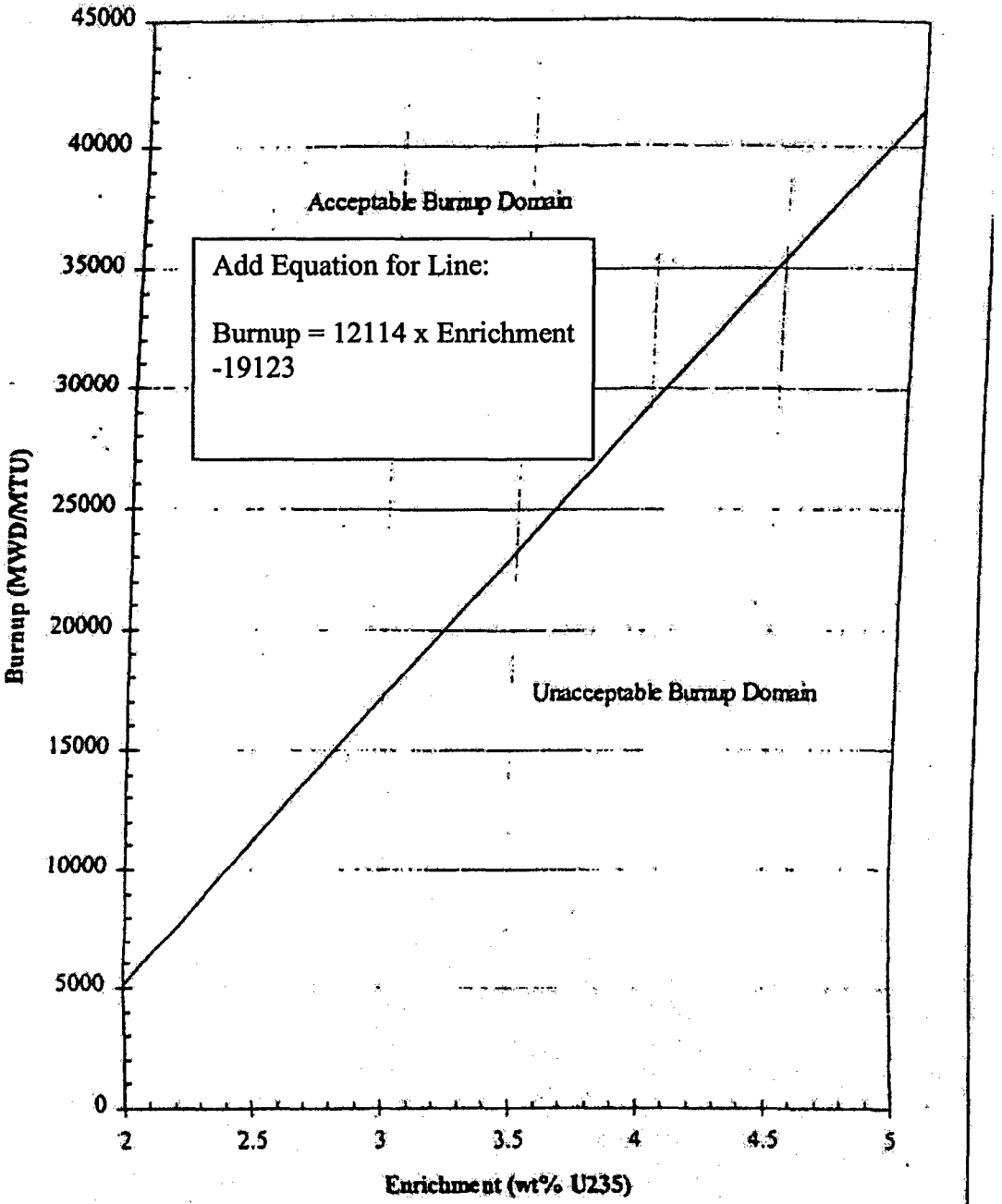
Technical Specification Insert B:

4. PWR and BWR storage racks in Pools "C" and "D"

    a. $k_{eff} \leq 0.95$ with unborated water.

Technical Specification Insert C:

5. In each case, k_{eff} includes allowances for uncertainties as described in Section 4.3.2.6 of the FSAR.



POOLS "C" AND "D"

FIGURE 5.6-1
BURNUP VERSUS ENRICHMENT FOR PWR FUEL

New Technical Specification Figure

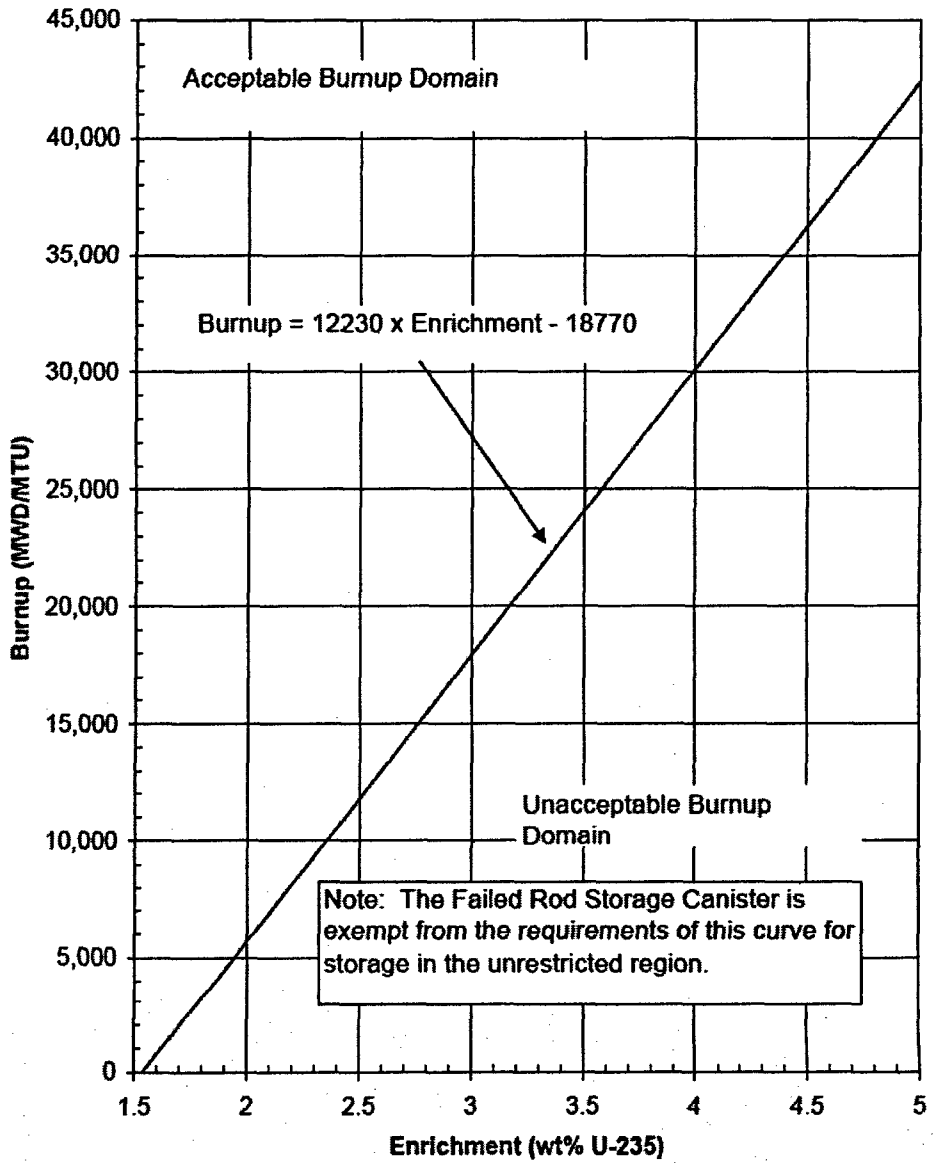


Figure 5.6-2
Pools "A" and "B" BURNUP VERSUS ENRICHMENT FOR PWR FUEL

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
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3/4.7.14 FUEL STORAGE POOL BORON CONCENTRATION

LIMITING CONDITION FOR OPERATION

3.7.14 The boron concentration of spent fuel pools shall be ≥ 2000 ppm.

APPLICABILITY: At ALL TIMES for pools that contain nuclear fuel.

ACTION:

a. With the spent fuel pool boron concentration not within the limits, immediatley suspend movement of fuel assemblies.
b. Immediately initiate action to restore pool boron concentration within the limit.

SURVEILLANCE REQUIREMENTS

4.7.14 At least once every 7 days verify spent fuel pool boron concentration is within the limit by:

a. Sampling the water volume connected to or in applicable pools.

b. In addition to 4.7.14.1, sampling an individual pool containing nuclear fuel if the pool is isolated from other pools.

5.6 FUEL STORAGE

CRITICALITY

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

1. PWR storage racks in pools "A" and "B"

   a. k_{eff} less than or equal to 0.95 if fully flooded with water borated to 2000ppm.

   b. k_{eff} less than 1.0 if flooded with unborated water.

   c. A nominal 10.5 inch center-to-center distance between fuel assemblies.

   d. Assemblies must be within the "acceptable range" of the burnup restrictions shown in Figure 5.6-2 prior to storage in unrestricted storage.

   e. Assemblies that do not meet the requirements of 5.6.1.1.d shall be stored in a 2-of-4 checkerboard within and across rack module boundaries. Less dense storage patterns (e.g. 1-of-4 or 1-of-5) are acceptable in place of 2-of-4.

   f. The empty spaces (water holes) in the 5.6.1.1.e checkerboard may be occupied by non-fuel items (e.g., containment specimen and trash baskets, mock fuel assemblies etc.) up to a limit of one per every 6 storage spaces.

   g. If fuel that meets the requirement of 5.6.1.1.d and fuel that does not meet 5.6.1.1.d are stored in the same rack module,an interface region must exist between the two regions. The interface region shall either be an empty row/column or a row/column of fuel that meets the requirements of 5.6.1.1.d in a checkerboard pattern with the restricted (5.6.1.1.e) region.

2. Dry New Fuel PWR Storage Racks

   a. Fuel assemblies having a maximum U-235 enrichment of 5.0 weight percent.

   b. k_{eff} ≤0.95 if fully flooded with unborated water without credit for Boraflex in the rack module.

   c. k_{eff} ≤ 0.98 in an optimum moderation event.

   d. A nominal 10.5 inch center to center distance between storage cells with alternating rows and columns blocked such that fuel is stored in a 1-of-4 pattern.

3. BWR Storage Racks in Pools "A" and "B"

   a. k_{eff} less than or equal to 0.95 when flooded with unborated water.

   b. The reactivity margin is assured for BWR racks in pools "A" and "B" by maintaining a nominal 6.25 inch center-to-center distance in the BWR storage racks.

4. PWR and BWR racks in pools "C" and "D"

   a. k_{eff} less than or equal to 0.95 when flooded with unborated water.

   b. The reactivity margin is assured for pools "C" and "D" by maintaining a nominal 9.017 inch center-to-center distance between fuel assemblies placed in the non-flux trap style PWR storage racks and 6.25 inch center-to-center distance in the BWR storage racks.

   c. The following restrictions are also imposed through administrative controls:

      1. PWR assemblies must be within the "acceptable range" of the burnup restrictions shown in Figure 5.6-1 prior to storage in pools "C" and "D".

      2. BWR assemblies are acceptable for storage in pool "C" provided the maximum planar average enrichments are less than 4.6 wt.% U235 and K_{inf} is less than or equal to 1.32 for the standard cold core geometry (SCCG).

5. In each case, k_{eff} includes allowances for uncertainties as described in Section 4.3.2.6 of the FSAR.

DRAINAGE

5.6.2 The pools "A", "B", "C" and "D" are designed and shall be maintained to prevent inadvertent draining of the pools below elevation 277.

CAPACITY

5.6.3.a Pool "A" contains six (6 x 10 cell) flux trap type PWR racks and three (11 x 11 cell) BWR racks for a total storage capacity of 723 assemblies. Pool "B" contains six (7 x 10 cell), five (6 x 10 cell), and one (6 x 8 cell) flux trap style PWR racks and seventeen (11 x 11 cell) BWR racks and is licensed for one additional (11 x 11 cell) BWR rack that will be installed as needed. The combined pool "A" and "B" licensed storage capacity is 3669 assemblies.

5.6.3.b Pool "C" is designed to contain a combination of PWR and BWR assemblies. Pool "C" can contain two (11 x 9 cell) and nine (9 X 9 cell) PWR racks for storage of 927 PWR assemblies. Pool "C" can contain two (8 x 13 cell), two (8 x 11 cell), six (13 x 11 cell), and nine (13 x 13 cell) BWR racks for storage of 2763 BWR assemblies. The (9 x 9 cell) PWR racks and the (13 x 13 cell) BWR racks are dimensioned to allow interchangeability between PWR or BWR storage rack styles as required. The racks in pool "C" will be installed as needed.

5.6.3.c Pool "D" contains a variable number of PWR storage spaces. These racks will be installed as needed. Pool "D" is designed for a maximum storage capacity of 1025 PWR assemblies.

5.6.3.d The heat load from fuel stored in Pools "C" and "D" shall not exceed 7.0 MBtu/hr.

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.

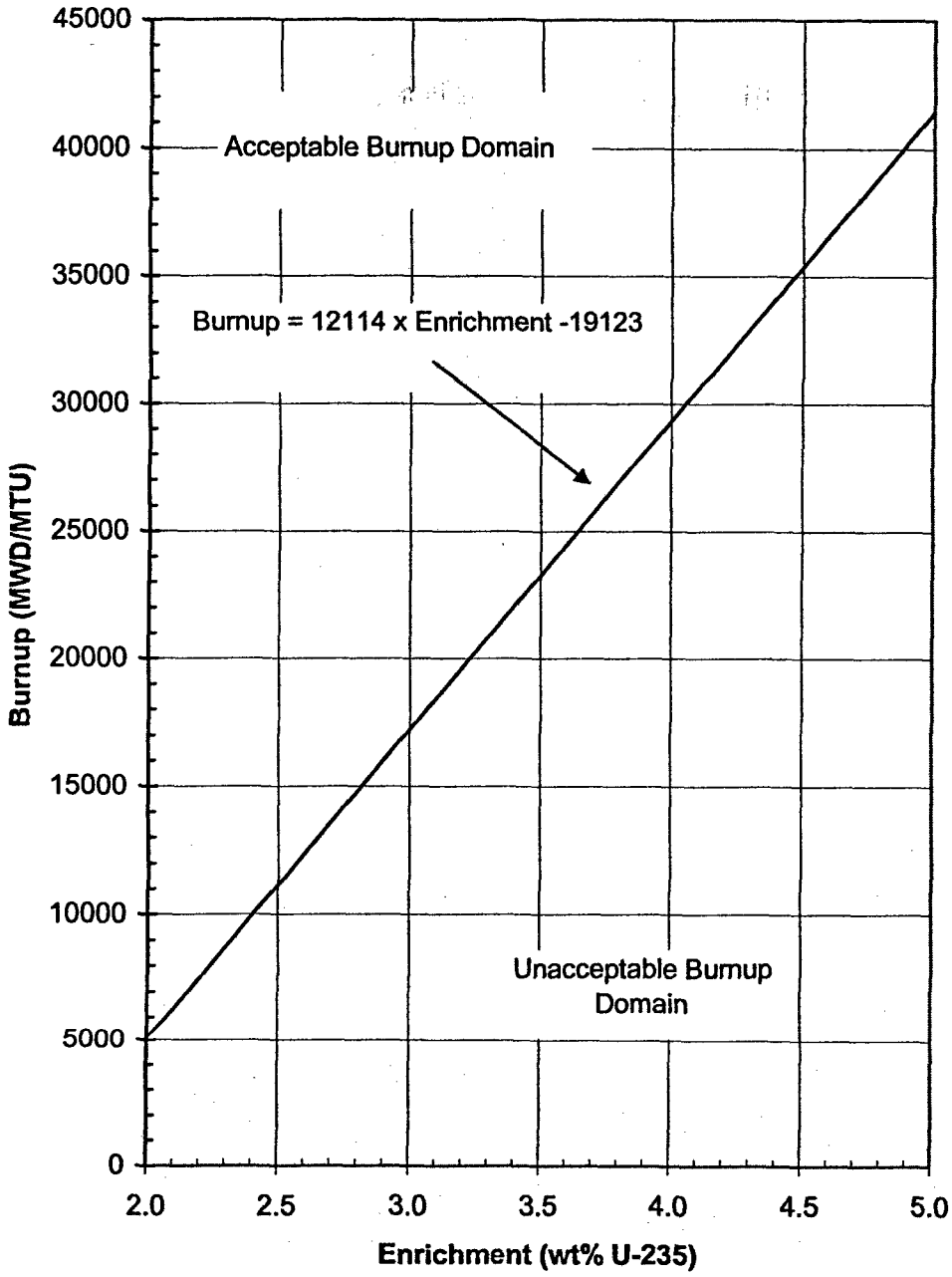

FIGURE 5.6-1
POOLS "C" and "D" BURNUP VERSUS ENRICHMENT FOR PWR FUEL

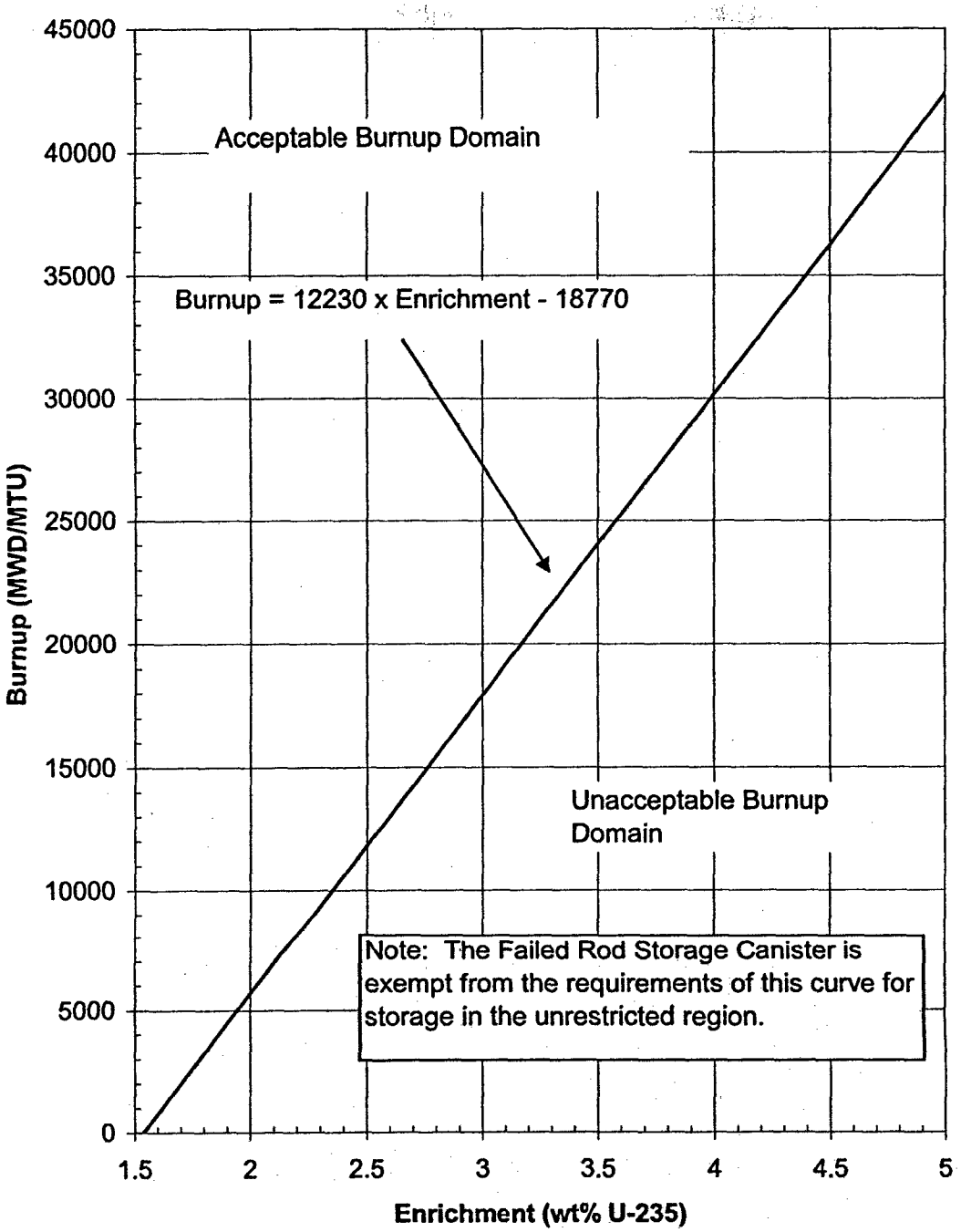

FIGURE 5.6-2
POOLS "A" and "B" BURNUP VERSUS ENRICHMENT FOR PWR FUEL