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Constellation Energy
Nine Mile Point Nuclear Station

April 3, 2008

U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

ATTENTION: Document Control Desk

SUBJECT: Nine Mile Point Nuclear Station
Unit No. 1, Docket No. 50-220

License Amendment Request Pursuant to 10 CFR 50.90: Elimination of Credit for Boraflex in Spent Fuel Pool Criticality Analyses - Technical Specification Section 5.5, Storage of Unirradiated and Spent Fuel

Pursuant to 10 CFR 50.90, Nine Mile Point Nuclear Station, LLC, (NMPNS) hereby requests an amendment to the Nine Mile Point Unit 1 (NMP1) Renewed Facility Operating License DPR-63. The proposed changes to the Technical Specifications (TS) contained herein would revise NMP1 TS Section 5.5, "Storage of Unirradiated and Spent Fuel," to reflect the current spent fuel storage rack configuration and to eliminate reliance on Boraflex™ as a neutron absorber in the two remaining Boraflex storage racks located in the spent fuel storage pool. New criticality analyses have been performed to support the proposed change. These analyses credit existing administrative controls to assure that the two Boraflex storage racks (re-characterized as non-poison racks) are loaded with fuel of a specified reactivity such that acceptable margins of subcriticality are maintained.

The Enclosure provides a description and technical bases for the proposed changes and an existing TS page marked up to show the proposed changes. NMPNS has concluded that the activities associated with the proposed changes represent no significant hazards consideration under the standards set forth in 10 CFR 50.92. The enclosed submittal contains no regulatory commitments.

Approval of the proposed amendment is requested by March 31, 2009, with implementation within 120 days of receipt of the approved amendment.

Pursuant to 10 CFR 50.91(b)(1), NMPNS has provided a copy of this license amendment request, with Enclosure, to the appropriate state representative.

A001

NRR

Should you have any questions regarding the information in this submittal, please contact T. F. Syrell, Licensing Director, at (315) 349-5219.

Very truly yours,

STATE OF NEW YORK :
: **TO WIT:**
COUNTY OF OSWEGO :

I, Keith J. Polson, being duly sworn, state that I am Vice President-Nine Mile Point, and that I am duly authorized to execute and file this license amendment request on behalf of Nine Mile Point Nuclear Station, LLC. To the best of my knowledge and belief, the statements contained in this document are true and correct. To the extent that these statements are not based on my personal knowledge, they are based upon information provided by other Nine Mile Point employees and/or consultants. Such information has been reviewed in accordance with company practice and I believe it to be reliable.

Subscribed and sworn before me, a Notary Public in and for the State of New York and County of Oswego, this 3rd day of april, 2008.

WITNESS my Hand and Notarial Seal:

Notary Public

SANDRA A. OSWALD
Notary Public, State of New York
No. 01OS6032276
Qualified in Oswego County
Commission Expires 10/25/07

My Commission Expires:

10/25/09
Date

KJP/DEV

Enclosure: Evaluation of the Proposed Change

cc: S. J. Collins, NRC
R. V. Guzman, NRC
Resident Inspector, NRC
J. P. Spath, NYSERDA

ENCLOSURE

EVALUATION OF THE PROPOSED CHANGE

TABLE OF CONTENTS

1.0 SUMMARY DESCRIPTION

2.0 DETAILED DESCRIPTION

- 2.1 Description of the Proposed Change
- 2.2 Background

3.0 TECHNICAL EVALUATION

- 3.1 Criticality Analyses
- 3.2 Other Considerations
- 3.3 Conclusions

4.0 REGULATORY EVALUATION

- 4.1 Applicable Regulatory Requirements/Criteria
- 4.2 Precedent
- 4.3 Significant Hazards Consideration
- 4.4 Conclusions

5.0 ENVIRONMENTAL CONSIDERATION

6.0 REFERENCES

ATTACHMENTS

1. Proposed Technical Specification Changes (Mark-up)

2. Report No. NET-290-01, Revision 1, Evaluation of the Nine Mile Point 1 Boraflex Spent Fuel Racks with 7x7, 8x8 and 9x9 Fuel Assemblies Taking No Credit for Boraflex for Reactivity Control

1.0 SUMMARY DESCRIPTION

This evaluation supports a request to amend Renewed Operating License DPR-63 for Nine Mile Point Unit 1 (NMP1). The proposed change would revise NMP1 Technical Specification (TS) Section 5.5, "Storage of Unirradiated and Spent Fuel," to reflect the current spent fuel storage rack configuration and to eliminate reliance on Boraflex™ as a neutron absorber in the two remaining Boraflex storage racks that are located in the southwest portion of the spent fuel storage pool. New criticality analyses have been performed to support the proposed change. These analyses credit existing administrative controls to assure that these two storage racks (re-characterized as non-poison racks) are loaded with fuel of a specified reactivity such that acceptable margins of subcriticality are maintained.

Nuclear industry experience has demonstrated that Boraflex material undergoes gamma radiation-induced degradation in the spent fuel pool environment. Nine Mile Point Nuclear Station, LLC (NMPNS) has an existing Boraflex Monitoring Program to manage degradation of the Boraflex material in the NMP1 spent fuel pool storage racks resulting from radiation exposure and possible water ingress. In the License Renewal Application for NMP1, NMPNS committed to enhance the Boraflex Monitoring Program to provide reasonable assurance that aging effects will be effectively managed. A summary description of the Boraflex Monitoring Program and the commitment to enhance the program are contained in Appendix C to the NMP1 Updated Final Safety Analysis Report (UFSAR). The proposed license amendment, if approved, will eliminate reliance on Boraflex for spent fuel pool reactivity control. Therefore, continued performance of the Boraflex Monitoring Program and the License Renewal commitment to enhance the program will no longer be necessary and will terminate with implementation of the approved license amendment.

2.0 DETAILED DESCRIPTION

2.1 Description of the Proposed Change

TS Section 5.5 currently describes three allowable spent fuel storage conditions. These are:

1. 1066 spent fuel assemblies with up to 15.6 grams (3.0 weight percent) of Uranium-235 per axial centimeter of assembly can be stored in non-poison flux trap racks in the north half of the spent fuel pool.

2. 1710 spent fuel assemblies with up to 18.13 grams (3.75 weight percent) of Uranium-235 per axial centimeter of assembly can be stored in Boraflex racks in the south half of the spent fuel pool.

3. The north and south half of the pool are analyzed to store 1840 and 2246 fuel assemblies, respectively, using racks containing the neutron absorber material Boral™. The Boral racks must have a peak lattice enrichment of 4.6% or less and the k-infinity in the standard cold core geometry must be less than or equal to 1.31.

The above spent fuel storage conditions were incorporated by License Amendment No 167, which was issued by NRC letter dated June 17, 1999 (Reference 1). The purpose of including these three allowable conditions was to accommodate interim configurations of old and new storage racks while the spent fuel pool was being re-racked with new high-density Boral storage racks. Such interim configurations were evaluated and found acceptable as part of License Amendment No. 167.

As discussed in UFSAR Section X-H.1.0, the non-poison flux trap spent fuel storage racks in the north half of the spent fuel pool were replaced with Boral storage racks after the 1999 refueling outage. However, in the south half of the spent fuel pool, only six of the eight Boraflex storage racks have been replaced with Boral storage racks. Two Boraflex storage racks remain in the southwest portion of the spent fuel pool. New criticality analyses have been performed for these two remaining Boraflex racks in which the presence of Boraflex as a neutron absorbing material is not credited.

Based on the above, the following changes to TS Section 5.5 are proposed:

- TS Section 5.5 is separated into two subsections: Section 5.5.1, titled "Spent Fuel Storage," and Section 5.5.2, titled "Unirradiated Fuel Storage." This is an editorial change.

- The criticality design criterion applicable to all of the spent fuel storage racks in the spent fuel pool is stated at the beginning of TS Section 5.5.1. This criterion is that the racks are designed to maintain a $k_{eff} \leq 0.95$ when fully flooded with unborated water, including an allowance for uncertainties.

- The existing spent fuel storage condition regarding storage of 1066 spent fuel assemblies in non-poison flux trap storage racks in the north half of the spent fuel pool is deleted.

- The existing spent fuel storage condition regarding storage of 1710 spent fuel assemblies in Boraflex storage racks in the south half of the spent fuel pool is deleted.

- The existing spent fuel storage condition regarding storage of spent fuel assemblies in Boral storage racks is revised by replacing the fuel assembly numbers stated for each of the north and south halves of the spent fuel pool (1840 and 2246 assemblies, respectively) with the total number of assemblies analyzed (4086). This is an administrative change.

- New requirements are added that reflect the current spent fuel storage configuration, consisting of: (1) Boral storage racks with 3496 storage locations; and (2) two non-poison storage racks (the Boraflex racks for which no credit is taken for Boraflex neutron absorption) with 414 storage locations. For spent fuel stored in these two non-poison racks, requirements regarding fuel types and reactivity limits are specified that are consistent with the criticality analyses.

Attachment 1 to this Enclosure contains existing TS page 346 marked up to show the proposed changes to TS Section 5.5.

2.2 Background

As discussed in UFSAR Section X-J.2.1, there are currently two types of spent fuel storage racks in the spent fuel storage pool: (1) high-density storage racks that use Boral neutron absorbing material; and (2) storage racks that use Boraflex neutron absorbing material. Both types of racks are designed to maintain adequate subcriticality margin ($k_{eff} \leq 0.95$) under all storage conditions.

In License Amendment No. 54 (Reference 2), the NRC approved the installation of Boraflex storage racks in the south half of the spent fuel storage pool. Following installation of the Boraflex racks, the total licensed spent fuel storage pool capacity was 2776 spent fuel assemblies. Specifically, the north half of the spent fuel pool contained eight storage racks of the non-poison flux trap (water box) design providing 1066 storage locations, and the south half of the spent fuel pool contained eight storage racks fabricated using Boraflex neutron absorbing material providing 1710 storage locations. Detailed analyses and evaluations were performed to demonstrate the acceptability of installing the Boraflex racks. Those analyses and evaluations, summarized in the safety evaluation that accompanied the NRC letter issuing License Amendment No. 54, included the following topical areas: criticality, spent fuel pool cooling, materials compatibility, storage rack and spent fuel pool structural integrity, installation and heavy load handling, and occupational radiation exposure.

In License Amendment No. 167 (Reference 1), the NRC approved re-racking the spent fuel pool with high-density fuel storage racks that use Boral neutron absorbing material. The re-racking was to be accomplished in two phases. In the first phase, the non-poison flux trap storage racks in the north half of the spent fuel pool were replaced with Boral storage racks after the 1999 refueling outage. The second phase was to replace the Boraflex racks in the south half of the spent fuel pool with Boral storage racks; however, only six of the eight Boraflex storage racks have been replaced. Two Boraflex storage racks remain in the southwest portion of the spent fuel pool.

The proposed changes to TS Section 5.5 retain the existing requirements that were based on completely re-racking the spent fuel pool with Boral storage racks. Detailed analyses and evaluations were performed to demonstrate the acceptability of installing these high-density storage racks, with a total of 4086 storage locations. Those analyses and evaluations, summarized in the safety evaluation that accompanied the NRC letter issuing License Amendment No. 167, included the following topical areas: criticality, spent fuel pool cooling, materials compatibility, storage rack and spent fuel pool structural integrity, occupational radiation exposure, solid radioactive waste, and fuel handling accident dose consequences. Also considered were interim configurations that could exist during the re-racking activity.

Replacement of the last two Boraflex racks in the south half of the spent fuel pool has been deferred for the foreseeable future. The Boraflex material will remain in place in these two storage racks; however, because nuclear industry experience has demonstrated that the Boraflex material undergoes gamma radiation-induced degradation in the spent fuel pool environment, NMPNS proposes to eliminate reliance on Boraflex for reactivity control in the NMP1 spent fuel storage racks. New criticality analyses have been performed for these two Boraflex racks that do not credit neutron absorption by the Boraflex material. These new criticality analyses provide the technical basis for the proposed changes to Technical Specification 5.5. With the elimination of reliance on Boraflex for spent fuel pool reactivity control, the Boraflex Monitoring Program and the License Renewal commitment to enhance the program will no longer be necessary and will terminate with implementation of the approved license amendment. Benefits associated with termination of the Boraflex Monitoring Program include: (1) reductions in occupational radiation exposure that would otherwise be incurred during in-situ Boraflex testing and coupon retrieval; and (2) reductions in risk associated with lifting of the work platform (a heavy load) that is currently installed over a portion of the Boraflex spent fuel racks to allow access for in-situ Boraflex testing.

3.0 TECHNICAL EVALUATION

The basis for requesting the proposed changes to NMP1 TS Section 5.5 is to eliminate reliance on Boraflex for reactivity control in the spent fuel storage racks. New criticality analyses for the two remaining Boraflex storage racks have been performed to support this amendment request. The following sections summarize the criticality analyses and discuss other considerations that support the proposed changes.

3.1 Criticality Analyses

New criticality analyses have been performed for the two remaining Boraflex spent fuel storage racks. The details of these analyses are provided in Report No. NET-290-01 that is provided in Attachment 2 to this Enclosure. The analyses demonstrate that the effective multiplication factor, k_{eff}, is less than or equal to 0.95 with the storage racks fully loaded with fuel of a specified reactivity and the spent fuel pool flooded with unborated, demineralized water with a density of 1.0 gm/cm^3, with no credit for the Boraflex neutron absorbing material. The computer codes KENO V.a from the SCALE-PC package and CASMO-4 have been used for these analyses. These computer codes are widely used for the analysis of fuel storage rack reactivity, and have been validated and verified for spent fuel storage rack evaluations by benchmarking calculations of light water reactor critical experiments as described in the appendix to the Attachment 2 report.

The criticality analyses considered storage of 7x7, 8x8, and 9x9 fuel types in the two remaining Boraflex storage racks. For the "south" Boraflex rack, the as-loaded configuration was used due to the presence of a work table (a heavy load) that is installed immediately above the rack, thereby precluding routine movement of fuel assemblies into or out of the rack. For conservatism and to simplify the analysis, higher than actual fuel enrichments were assumed for the as-loaded fuel assemblies in this "south" Boraflex rack. For the "north" Boraflex storage rack, the most reactive 9x9 assembly that can be stored was determined. The analysis also assumed that the neighboring Boral storage racks contain 10x10 fuel assemblies. Although the NMP1 fuel pool is not currently licensed to store 10x10 fuel, the 10x10 fuel type has been shown to be more reactive than 9x9 fuel; therefore, this assumption is conservative.

To assure that the actual fuel/rack reactivity is always less than the calculated maximum reactivity, a number of conservative assumptions have been applied to the analyses, as outlined in Section 2.0 of Attachment 2. The maximum calculated reactivities also include a margin for uncertainty in the reactivity calculations, including manufacturing tolerances (see Section 3.3 of Attachment 2), and were calculated with a 95% probability at a 95% confidence level. The final result, excluding accident or abnormal conditions, shows the maximum k_{eff} remains less than 0.95.

Abnormal and accident conditions, including a dropped fuel assembly, inadvertent positioning of a fuel assembly alongside the fuel rack, misloaded fuel assembly, and moderator temperature variations, were also evaluated. The analyses demonstrate that none of the abnormal or accident conditions that have been identified as credible result in exceeding the limiting reactivity (k_{eff} of 0.95).

The new requirements that are proposed to be added to TS Section 5.5 reflect the current spent fuel storage configuration, consisting of: (1) Boral storage racks with 3496 storage locations; and (2) two non-poison storage racks (the Boraflex racks for which no credit is taken for Boraflex neutron absorption) with 414 storage locations. For the spent fuel stored in these two non-poison racks, requirements regarding fuel types and reactivity limits are specified that are consistent with the new criticality analyses. Existing administrative controls for spent fuel storage rack loading assure that the assumptions of these new analyses are met.

3.2 Other Considerations

3.2.1 Boraflex Monitoring Program

This proposed amendment would eliminate reliance on Boraflex for spent fuel pool reactivity control. Therefore, continued performance of the Boraflex Monitoring Program and the License Renewal commitment to enhance the program will no longer be necessary and will terminate with the approval of this license amendment request.

3.2.2 Spent Fuel Pool Cooling Analyses

The proposed changes do not increase the decay heat load imposed on the spent fuel pool, the spent fuel pool cooling system, or the environment. The proposed changes only eliminate credit for Boraflex as a neutron absorbing material. This amendment does not increase the number of fuel assemblies that may be stored in the pool and it does not adversely affect the properties controlling local heat transfer from fuel rod cladding. Therefore, the proposed amendment does not change the conclusions of the previous spent fuel pool cooling analyses that were performed to support issuance of License Amendment No. 167 (Reference 1).

3.2.3 Seismic/Structural Integrity Analyses

Implementation of the proposed amendment requires no physical changes to the existing spent fuel storage racks or to the fuel pool itself. Elimination of credit for Boraflex does not structurally alter the existing spent fuel storage racks in any way. The same rack locations will continue to be used for storing fuel assemblies; thus, the weight assumptions used in the seismic/structural analyses are unchanged. None of the parameters affecting the fuel pool structural integrity analyses are changed by the elimination of credit for Boraflex. Therefore, the proposed amendment does not affect the conclusions of the previous spent fuel storage rack and pool structural analyses that were performed to support issuance of License Amendment Nos. 54 and 167.

3.2.4 Materials Considerations

The compatibility and chemical stability of the materials used in both the Boral spent fuel storage racks and in the Boraflex spent fuel storage racks have been previously evaluated as part of the analyses that were performed to support issuance of License Amendment Nos. 54 and 167. Elimination of credit for Boraflex does not physically alter the existing spent fuel storage racks in any way or involve the use of any new materials. Therefore, the proposed amendment does not affect the conclusions of the previous materials evaluations that were performed to support issuance of License Amendment Nos. 54 and 167.

3.2.5 Radiological Considerations

Solid Radioactive Waste Generation

The existing spent fuel storage racks will remain in place, without modification. Elimination of credit for Boraflex will not involve any new processes or equipment that could result in additional radioactive waste generation. Thus, no change in the generation of solid radioactive waste will result from implementing this proposed amendment.

Occupational Exposure

The existing spent fuel storage racks will remain in place, without modification, and no repositioning of spent fuel assemblies will be necessary to implement the new Technical Specification requirements associated with the elimination of credit for Boraflex. In addition, this amendment does not increase the number of fuel assemblies that may be stored in the spent fuel pool and does not otherwise change the inventory or radiological source term of the spent fuel. Therefore, no increase in individual or cumulative occupational radiation exposures will result from implementing this proposed amendment.

3.2.6 Refueling Accident Probability and Consequences

Neither the spent fuel storage racks nor the fuel handling equipment are being modified by the proposed license amendment, and no repositioning of spent fuel assemblies will be necessary; thus, there is no change in the probability of occurrence of a refueling accident.

The radiological consequences of a design basis refueling accident have been evaluated using alternative source term (AST) methodology. The AST analyses were submitted to the NRC by NMPNS letter dated December 14, 2006 (Reference 3), and were accepted by the NRC in the safety evaluation accompanying the issuance of License Amendment No. 194 (Reference 4). The analysis uses a radiological source term that is bounding for all fuel types currently stored in the spent fuel pool. Neither this source term nor the spent fuel pool decontamination factor are affected by the elimination of credit for Boraflex as a neutron absorbing material.

The effects on reactivity of a refueling accident occurring in the spent fuel storage racks were evaluated as part of the new criticality analyses described in Section 3.5 of Attachment 2. These effects were found to be acceptable.

3.2.7 Changes to Existing TS Section 5.5 Requirements

The existing TS Section 5.5 spent fuel storage condition regarding storage of 1066 spent fuel assemblies in non-poison flux trap storage racks in the north half of the spent fuel pool is deleted. This is acceptable since the non-poison flux trap storage racks have been removed from spent fuel pool and replaced with Boral storage racks. Installation of the Boral storage racks was previously accepted by the NRC in License Amendment No. 167.

The existing TS Section 5.5 spent fuel storage condition regarding storage of 1710 spent fuel assemblies in Boraflex storage racks in the south half of the spent fuel pool is also deleted. All but two of the Boraflex storage racks have been removed from the spent fuel pool and replaced with Boral storage racks. Installation of the Boral storage racks was previously accepted by the NRC in License Amendment No. 167. As described in Sections 3.1 and 3.2.1 through 3.2.6 above, analyses and evaluations have been performed in which credit for Boraflex has been eliminated. For spent fuel stored in these two Boraflex racks (re-characterized as non-poison racks), requirements regarding fuel types and reactivity limits are specified in the proposed changes to TS Section 5.5 (see markup in Attachment 1) that are consistent with the new criticality analyses.

The existing TS Section 5.5 spent fuel storage condition regarding storage of spent fuel assemblies in Boral storage racks is revised by replacing the fuel assembly numbers stated for each of the north and south halves of the spent fuel pool (1840 and 2246 assemblies, respectively) with the total number of assemblies analyzed (4086). This is an administrative change. There is no need or benefit to stating the fuel storage capacity in terms of the north and south halves of the spent fuel pool. The analyses and evaluations performed to support License Amendment No. 167 were based on re-racking of the entire spent fuel pool with Boral storage racks with a total capacity of 4086 storage locations.

3.3 Conclusions

The new criticality analyses performed for the two remaining Boraflex spent fuel storage racks demonstrate that the existing racks will maintain k_{eff} less than or equal to 0.95 for normal storage conditions and also for credible abnormal and accident conditions. The proposed Technical Specification changes incorporate requirements for these two storage racks regarding fuel types and reactivity limits that are consistent with the new criticality analyses. Other topical areas, including spent fuel pool cooling, materials compatibility, storage rack and spent fuel pool structural integrity, occupational radiation exposure, solid radioactive waste, and fuel handling accident dose consequences, are unaffected by the proposed changes.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

General Design Criterion (GDC) 62, "Prevention of criticality in fuel storage and handling," states that criticality in the fuel storage and handling system shall be prevented by physical systems or processes, preferably by use of geometrically safe configurations. In NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants" (SRP), Section 9.1.1, the NRC has established a 5% subcriticality margin (i.e., k_{eff} less than or equal to 0.95) for nuclear power plant operators to comply with GDC 62. The current spent fuel pool criticality analyses are summarized in UFSAR Section X-J.2.0 and were accepted by the NRC with the issuance of License Amendment No. 167. New criticality analyses have been performed for the two remaining Boraflex spent fuel storage racks in accordance with the SRP 9.1.1 guidance, with no credit for neutron absorption by the Boraflex material. These analyses, provided in Attachment 2 to this Enclosure, demonstrate that k_{eff} will remain less than or equal to 0.95 with no credit for the Boraflex neutron absorbing material.

10 CFR 50.68, "Criticality accident requirements," paragraph (b)(4), requires that, if no credit for soluble boron is taken, the k_{eff} of the spent fuel storage racks loaded with fuel of the maximum fuel assembly reactivity must not exceed 0.95, at a 95 percent probability, 95 percent confidence level, if flooded with unborated water. The new criticality analyses performed for the two remaining Boraflex spent fuel storage racks, provided in Attachment 2, demonstrate that this requirement is met.

4.2 Precedent

The NRC has approved license amendments at other plants to eliminate reliance on Boraflex for spent fuel pool reactivity control. These include:

- H. B. Robinson Steam Electric Plant, Unit No. 2 (License Amendment No. 198 issued by NRC letter dated December 22, 2003 – TAC No. MB9148). Credit for Boraflex for reactivity control was eliminated. Instead, credit was taken for a combination of soluble boron in the spent fuel pool water and controlled fuel loading patterns to maintain required criticality margins. The programs for monitoring the condition of the Boraflex and the silica content of the pool water were also eliminated.

- St. Lucie Unit 1 (License Amendment No. 193 issued by NRC letter dated September 23, 2004 – TAC No. MB6864). Credit for Boraflex for reactivity control was eliminated. Instead, credit was taken for a combination of soluble boron in the spent fuel pool water, fuel loading restrictions and control element assemblies to maintain required criticality margins.

- Turkey Point Units 3 and 4 (License Amendment Nos. 234 and 229, respectively, issued by NRC letter dated July 17, 2007 – TAC No. MC9740 and MC9741). Credit for Boraflex for reactivity control was eliminated. Instead, credit was taken for a combination of rod cluster control assemblies, Metamic™ rack inserts, and administrative controls on fuel loading patterns to maintain required criticality margins.

The NMP1 license amendment request is similar to the above license amendments with regard to eliminating credit for Boraflex for reactivity control, crediting controlled fuel loading patterns, and eliminating the Boraflex monitoring program. The NMP1 request differs from the above license amendments in that the NMP1 criticality analyses do not credit soluble boron in the spent fuel pool water, control rods, or the addition of other neutron absorbing material such as Metamic.

4.3 Significant Hazards Consideration

Nine Mile Point Nuclear Station, LLC (NMPNS) is requesting revisions to Nine Mile Point Unit 1 (NMP1) Technical Specification (TS) Section 5.5, "Storage of Unirradiated and Spent Fuel." The proposed changes would reflect the current spent fuel storage rack configuration and would eliminate reliance on Boraflex™ as a neutron absorber in the two remaining Boraflex storage racks located in the spent fuel storage pool. New criticality analyses have been performed to support the proposed change. These analyses credit existing administrative controls to assure that these two storage racks (re-characterized as non-poison racks) are loaded with fuel of a specified reactivity such that acceptable margins of subcriticality are maintained.

NMPNS has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of Amendment," as discussed below:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No.

   The proposed amendment eliminates credit for Boraflex for reactivity control in the spent fuel storage racks and deletes fuel storage requirements that are no longer applicable. The amendment does not change or modify the fuel, fuel handling processes, spent fuel storage racks, decay heat generation rate, or the spent fuel pool cooling and cleanup system, and the number of fuel assemblies that may be stored in the spent fuel pool is not increased. The proposed amendment was evaluated for impact on the following previously evaluated events and accidents:

   - Refueling accident,
   - A fuel mispositioning event,
   - A fuel misloading event, and
   - An event causing spent fuel pool temperature variations.

   The probability of a refueling accident is not significantly increased because implementation of the proposed amendment will employ the same equipment and processes to handle fuel assemblies that are currently used. The refueling accident radiological consequences are not increased because the radiological source term assumed in the analysis will remain unchanged. Therefore, the proposed amendment does not significantly increase the probability or consequences of a refueling accident.

   Operation in accordance with the proposed amendment will not change the probability of a fuel mispositioning or fuel misloading event because fuel movement will continue to be controlled by approved fuel handling procedures. The consequences of such events are not changed because the criticality analyses demonstrate that the subcriticality criterion (effective multiplication factor less than or equal to 0.95) continues to be met for the worst-case fuel mispositioning and fuel misloading events.

Operation in accordance with the proposed amendment will not change the probability of events that could cause variations in spent fuel pool water temperature, such as a loss of spent fuel pool cooling, because the systems and events that could affect spent fuel pool cooling are unchanged. The consequences are not significantly increased because there are no changes in the spent fuel pool heat load or spent fuel pool cooling systems, structures or components.

Based on the above discussion, it is concluded that the proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The proposed amendment eliminates credit for Boraflex for reactivity control in the spent fuel storage racks and deletes fuel storage requirements that are no longer applicable. The existing spent fuel storage racks will remain in place, without modification, and no repositioning of spent fuel assemblies will be necessary to implement the new Technical Specification requirements associated with the elimination of credit for Boraflex. The amendment does not change or modify the fuel, fuel handling processes, decay heat generation rate, or the spent fuel pool cooling and cleanup system, and the number of fuel assemblies that may be stored in the spent fuel pool is not increased. No new modes of plant operation or accident precursors are introduced that could initiate a new or different kind of accident, affect the operation or function of plant equipment required for safe operation or safe shutdown of the plant, or involve a change to plant operating parameters. There are no changes in the criteria or design requirements pertaining to spent fuel storage safety, including subcriticality requirements, and analyses demonstrate that spent fuel storage in accordance with the proposed Technical Specification changes meets these requirements and criteria with adequate margins.

Therefore, the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No.

New criticality analyses have been performed that confirm that operation in accordance with the proposed amendment continues to meet the required subcriticality margins. The maximum spent fuel storage reactivities have been calculated using conservative assumptions and include margins for both calculation uncertainty and manufacturing tolerances. Credible abnormal and accident conditions, including a dropped fuel assembly, inadvertent positioning of a fuel assembly alongside the fuel rack, misloaded fuel assembly, and moderator temperature variations, have also been evaluated. In all cases, the results show that the maximum effective multiplication factor remains less than 0.95, in accordance with 10 CFR 50.68(b)(4).

The proposed amendment does not change or modify the fuel, fuel handling processes, decay heat generation rate, or the spent fuel pool cooling and cleanup system. Materials compatibility and storage rack and spent fuel pool structural integrity are also unaffected. The refueling accident radiological consequences are not increased because the radiological source term assumed in the analysis will remain unchanged.

Based on the above discussion, it is concluded that the proposed amendment does not involve a significant reduction in a margin of safety.

4.4 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20. However, the proposed amendment does not involve: (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

6.0 REFERENCES

1. Letter from D. S. Hood (NRC) to J. H. Mueller (NMPC), dated June 17, 1999, Issuance of Amendment for Nine Mile Point Nuclear Station, Unit No. 1 to Reflect a Planned Modification to Increase the Storage Capacity of the Spent Fuel Pool (TAC No. MA1945)

2. Letter from R. A. Hermann (NRC) to G. K. Rhode (NMPC), dated February 1, 1984, issuing Amendment No. 54 to Facility Operating License No. DPR-63 for the Nine Mile Point Nuclear Station, Unit No. 1

3. Letter from T. J. O'Connor (NMPNS) to Document Control Desk (NRC), dated December 14, 2006, License Amendment Request Pursuant to 10 CFR 50.90: Application of Alternative Source Term

4. Letter from M. J. David (NRC) to K. J. Polson (NMPNS), dated December 19, 2007, Nine Mile Point Nuclear Station, Unit No. 1 – Issuance of Amendment Re: Implementation of Alternative Radiological Source Term (TAC No. MD3896)

ATTACHMENT 1

PROPOSED TECHNICAL SPECIFICATION CHANGES (MARK-UP)

The current version of Technical Specification Page 346 has been marked-up by hand to reflect the proposed changes.

Insert A

5.5 Storage of Unirradiated and Spent Fuel

5.5.2 Unirradiated Fuel Storage

Unirradiated fuel assemblies will normally be stored in critically safe new fuel storage racks in the reactor building storage vault. Even when flooded with water, the resultant k_{eff} is less than 0.95. Fresh fuel may also be stored in shipping containers. The unirradiated fuel storage vault is designed and shall be maintained with a storage capacity limited to no more than 200 fuel assemblies.

1066 spent fuel assemblies with up to 15.6 grams (3.0 weight percent) of Uranium-235 per axial centimeters of assembly can be stored in non-poison flux trap racks in the north half of the spent fuel pool. 1710 spent fuel assemblies with up to 18.13 grams (3.75 weight percent) of Uranium-235 per axial centimeters of assembly can be stored in Boraflex racks in the south half of the pool. These racks have been designed to maintain a k_{eff} less than 0.95 under conditions of optimum water moderation. The north and south half of the pool are analyzed to store 1840 and 2246 fuel assemblies, respectively, using racks containing the neutron absorber material Boral. The Boral racks will maintain a k_{eff} of less than 0.95 under abnormal and accident conditions. The spent fuel stored in the Boral racks must have a peak lattice enrichment of 4.6 % or less and the k-inf in the standard cold core geometry must be less than or equal to 1.31.

5.6 (Deleted)

INSERT A (for TS Page 346)

5.5.1 Spent Fuel Storage

The spent fuel storage racks are designed to maintain a $k_{eff} \leq 0.95$ when fully flooded with unborated water, which includes an allowance for uncertainties as described in Section X-J.2.1 of the UFSAR.

The spent fuel pool is analyzed to store 4086 spent fuel assemblies using storage racks containing the neutron absorber material Boral. The spent fuel assemblies stored in the Boral storage racks must have a peak lattice enrichment of 4.6% or less, and the k-infinity in the standard cold core geometry must be ≤ 1.31.

The spent fuel pool is also analyzed to store 3496 spent fuel assemblies in Boral storage racks and 414 spent fuel assemblies in the two non-poison storage racks (3910 assemblies total). The spent fuel assemblies stored in the Boral storage racks must have a peak lattice enrichment of 4.6% or less, and the k-infinity in the standard cold core geometry must be ≤ 1.31.The spent fuel assemblies stored in the non-poison storage racks must satisfy the following criteria:

a. The north non-poison rack (storage cells 2B37 to 2M54 - 198 cells total) can be loaded with any of the existing 7x7 or 8x8 fuel types that are stored in the spent fuel pool, or with 9x9 fuel with a k-infinity in the standard cold core geometry of ≤ 1.2676.

b. The south non-poison rack (storage cells 2A55 to 2M72 - 216 cells total) can be loaded with 8x8 fuel with a k-infinity in the standard cold core geometry of ≤ 1.2164, except that storage cells 2A71, 2A72, 2D71 to 2F71 (3 cells), 2D72 to 2F72 (3 cells), 2K55, 2L55, and 2M59 to 2M72 (14 cells) can be loaded with 8x8 fuel with a k-infinity in the standard cold core geometry of ≤ 1.2258.