**Keith J. Polson**
**Vice President-Nine Mile Point**

**P.O. Box 63**
**Lycoming, New York 13093**
**315.349.5200**
**315.349.1321 Fax**

Constellation Energy
Nine Mile Point Nuclear Station

July 23, 2007

U. S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

**Attention:** Document Control Desk

**Subject:** Nine Mile Point Nuclear Station
Unit No. 2; Docket No. 50-410

Application for Technical Specification Improvement to Adopt TSTF-476, Revison 1, "Improved BPWS Control Rod Insertion Process (NEDO-33091)," Using the Consolidated Line Item Improvement Process

In accordance with the provisions of 10 CFR 50.90, Nine Mile Point Nuclear Station, LLC (NMPNS) is submitting a request for an amendment to the technical specifications (TSs) for Nine Mile Point, Unit 2 (NMP2), renewed operating license No. NPF-69. The proposed changes modify a footnote in NMP2 TS Table 3.3.2.1-1, "Control Rod Block Instrumentation," such that a new Banked Position Withdrawal Sequence (BPWS) shutdown sequence could be utilized. In conjunction with these changes, the TS Bases for Sections 3.1.6, "Rod Pattern Control," and 3.3.2.1, "Control Rod Block Instrumentation," will be revised to reflect the new BPWS shutdown sequence. The Bases changes will be made in accordance with NMP2 TS 5.5.10, "Technical Specifications (TS) Bases Control Program," upon implementation of the license amendment.

The changes are consistent with NRC approved Industry Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler, TSTF-476, Revision 1, "Improved BPWS Control Rod Insertion Process (NEDO-33091)." The availability of this TS improvement was announced in the *Federal Register* on May 23, 2007 (72 FR 29004) as part of the consolidated line item improvement process (CLIIP).

Attachment (1) provides a description and assessment of the proposed changes, as well as confirmation of applicability. Attachment (2) provides the existing TS pages marked up to show the proposed changes. Attachment (3) provides the existing TS Bases pages marked up to show the proposed changes.

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NRR

NMPNS requests approval of the proposed license amendment by January 31, 2008, with the amendment being implemented within the subsequent 60 days. In accordance with 10 CFR 50.91, a copy of this application, with attachments, is being provided to the designated New York state official.

Should you have any questions regarding 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 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 7/23/07 ~~23rd~~ 05W8990, this 23rd day of July, 2007.

**WITNESS** my Hand and Notarial Seal:

Notary Public

My Commission Expires: 11/12/2010
Date

TONYA L. JONES
Notary Public in the State of New York
Oswego County Reg. No. 01JO6083354
My Commission Expires 11/12/2010

KJP/JJD

Attachments: (1) Description and Assessment of Proposed Changes
(2) Proposed Technical Specification Changes (Mark-Up)
(3) Proposed Technical Specification Bases Changes (Mark-Up)

cc: M. J. David, NRC
S. J. Collins, NRC
Resident Inspector, NRC
J. P. Spath, NYSERDA
T. J. Kobetz, NRC

# ATTACHMENT (1)

# DESCRIPTION AND ASSESSMENT OF PROPOSED CHANGES

Nine Mile Point Nuclear Station, LLC
July 23, 2007

## 1.0 DESCRIPTION

This request is to amend renewed operating license No. NPF-69 for Nine Mile Point, Unit 2 (NMP2). The proposed changes modify a footnote in NMP2 Technical Specification (TS) Table 3.3.2.1-1, "Control Rod Block Instrumentation," such that a new Banked Position Withdrawal Sequence (BPWS) shutdown sequence could be utilized. In conjunction with these changes, the TS Bases for Sections 3.1.6, "Rod Pattern Control," and 3.3.2.1, "Control Rod Block Instrumentation," will be revised to reflect the new BPWS shutdown sequence.

The new BPWS is described in topical report NEDO-33091-A, Revision 2, "Improved BPWS Control Rod Insertion Process," dated July 2004, and approved by the NRC by Safety Evaluation (SE) dated June 16, 2004 (ADAMS ML041700479). Technical Specification Task Force (TSTF) change traveler TSTF-476, Revision 1, "Improved BPWS Control Rod Insertion Process (NEDO-33091)," was announced for availability in the *Federal Register* on May 23, 2007 as part of the consolidated line item improvement process (CLIIP).

## 2.0 PROPOSED CHANGES

Consistent with the NRC-approved TSTF-476, Revision 1, the proposed changes would:

- Revise TS Table 3.3.2.1-1, "Control Rod Block Instrumentation," to modify an existing footnote to allow operators to bypass the rod worth minimizer if conditions for the optional BPWS shutdown process are satisfied.

In conjunction with the proposed TS changes, the proposed TS Bases changes would:

- Revise TS Section 3.1.6 Bases to allow use of an optional BPWS during plant shutdown.
- Revise TS Section 3.3.2.1 Bases to allow reprogramming or bypassing of the rod worth minimizer during the optional BPWS shutdown sequence.

The Bases changes will be made in accordance with NMP2 TS 5.5.10, "Technical Specifications (TS) Bases Control Program," upon implementation of the license amendment.

## 3.0 BACKGROUND

The background for this request is as stated in the model SE in the NRC's Notice of Availability published on May 23, 2007 (72 FR 29004), the NRC Notice for Comment published on May 3, 2006 (71 FR 26118), and TSTF-476, Revision 1.

## 4.0 TECHNICAL ANALYSIS

Nine Mile Point Nuclear Station, LLC (NMPNS) has reviewed NEDO-33091-A, Revision 2, and the staff's SE dated June 16, 2004, as well as TSTF-476, Revision 1, and the model SE published on May 23, 2007 (72 FR 29004), as part of the CLIIP Notice of Availability. NMPNS has applied the methodology in NEDO-33091-A, Revision 2, to develop the proposed TS changes. NMPNS has also concluded that

the justifications presented in TSTF-476, Revision 1, and the model SE prepared by the NRC staff are applicable to NMP2 and justify this amendment for the incorporation of the changes to the NMP2 TSs.

## 5.0 REGULATORY ANALYSIS

A description of this proposed change and its relationship to applicable regulatory requirements and guidance was provided in the NRC Notice of Availability published on May 23, 2007 (72 FR 29004), the NRC Notice for Comment published on May 3, 2006 (71 FR 26118), and TSTF-476, Revision 1.

### 5.1 Regulatory Commitments

As discussed in the model SE published in the *Federal Register* on May 23, 2007 for this TS improvement, the following plant-specific verifications have been performed and commitments made. The SE for NEDO-33091-A explained that the potential for the control rod drop accident (CRDA) will be eliminated by the following changes to the operational procedures, which NMPNS has committed to make prior to implementation:

1. Before reducing power to the low power setpoint (LPSP), operators shall confirm control rod coupling integrity for all rods that are fully withdrawn. Control rods that have not been confirmed coupled and are in intermediate positions must be fully inserted prior to power reduction to the LPSP. No action is required for fully-inserted control rods.

   If shutdown is required and all rods, which are not confirmed coupled, cannot be fully inserted prior to the power dropping below the LPSP, then the original/standard BPWS must be adhered to. The original/standard BPWS can be found in Licensing Topical Report (LTR) NEDO-21231, "Banked Position Withdrawal Sequence," January 1977, and is referred to in NUREG-1433 and NUREG-1434.

2. After reactor power drops below the LPSP, rods may be inserted from notch position 48 to notch position 00 without stopping at the intermediate positions. However, GE Nuclear Energy recommends that operators insert rods in the same order as specified for the original/standard BPWS as much as is reasonably possible. If a plant is in the process of shutting down following improved BPWS with the power below the LPSP, no control rod shall be withdrawn unless the control rod pattern is in compliance with standard BPWS requirements.

In addition to the procedure changes specified above, the staff previously concluded, based on its review of NEDO-33091-A, that no single failure of the boiling water reactor control rod drive (CRD) mechanical or hydraulic system can cause a control rod to drop completely out of the core during the shutdown process. Therefore, the proper use of the improved BPWS will prevent a CDRA from occurring while power is below the LPSP. NMPNS has verified, in accordance with NEDO-33091-A, Revision 2, that no single failure of the NMP2 CRD mechanical or hydraulic system can cause a control rod to drop completely out of the reactor core during the shutdown process.

## 6.0 NO SIGNIFICANT HAZARDS CONSIDERATION

NMPNS has reviewed the proposed no significant hazards consideration determination published on May 23, 2007 (72 FR 29004) as part of the CLIIP. NMPNS has concluded that the proposed determination presented in the notice is applicable to NMP2 and the determination is hereby incorporated by reference to satisfy the requirements of 10 CFR 50.91(a).

## 7.0 ENVIRONMENTAL EVALUATION

NMPNS has reviewed the environmental consideration included in the model SE published on May 23, 2007 (72 FR 29004) as part of the CLIIP. NMPNS has concluded that the staff's findings presented therein are applicable to NMP2 and the determination is hereby incorporated by reference for this application.

## 8.0 REFERENCES

*Federal Register* Notices:

Notice for Comment published on May 3, 2006 (71 FR 26118)

Notice of Availability published on May 23, 2007 (72 FR 29004)

# ATTACHMENT (2)

# PROPOSED TECHNICAL SPECIFICATION CHANGES (MARK-UP)

TS Page

3.3.2.1-6

**Nine Mile Point Nuclear Station, LLC**
**July 23, 2007**

Table 3.3.2.1-1 (page 1 of 1)
Control Rod Block Instrumentation

| FUNCTION | APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS | REQUIRED CHANNELS | SURVEILLANCE REQUIREMENTS | ALLOWABLE VALUE |
|---|---|---|---|---|
| 1. Rod Block Monitor | | | | |
| a. Upscale | (a) | 2 | SR 3.3.2.1.3<br>SR 3.3.2.1.4<br>SR 3.3.2.1.7 | As specified in the COLR |
| b. Inop | (a) | 2 | SR 3.3.2.1.3<br>SR 3.3.2.1.4 | NA |
| c. Downscale | (a) | 2 | SR 3.3.2.1.3<br>SR 3.3.2.1.4<br>SR 3.3.2.1.7 | ≥ 3% RTP |
| 2. Rod Worth Minimizer | 1[(b)],2[(b)] | 1 | SR 3.3.2.1.1<br>SR 3.3.2.1.2<br>SR 3.3.2.1.5<br>SR 3.3.2.1.8 | NA |
| 3. Reactor Mode Switch – Shutdown Position | (c) | 2 | SR 3.3.2.1.6 | NA |

(a) THERMAL POWER ≥ 30% RTP and no peripheral control rod selected.

(b) With THERMAL POWER ≤ 10% RTP, Insert 1

(c) Reactor mode switch in the shutdown position.

INSERT 1

, except during the reactor shutdown process if the coupling of each withdrawn control rod has been confirmed.

# ATTACHMENT (3)

# PROPOSED TECHNICAL SPECIFICATION BASES CHANGES (MARK-UP)

The current versions of the following Technical Specifications Bases pages have been marked-up by hand to reflect the proposed changes. These Bases pages are provided for information only and do not require NRC approval.

B 3.1.6-2
B 3.1.6-5
B 3.3.2.1-4
B 3.3.2.1-12

**Nine Mile Point Nuclear Station, LLC**
**July 23, 2007**

BASES

| | |
|---|---|
| APPLICABLE SAFETY ANALYSES (continued) | Control rod patterns analyzed in Reference 1 follow the banked position withdrawal sequence (BPWS) described in Reference 10. The BPWS is applicable from the condition of all control rods fully inserted to 10% RTP (Ref. 2). For the BPWS, the control rods are required to be moved in groups, with all control rods assigned to a specific group required to be within specified banked positions (e.g., between notches 08 and 12). The banked positions are defined to minimize the maximum incremental control rod worths without being overly restrictive during normal plant operation. The generic BPWS analysis (Ref. 10) also evaluated the effect of fully inserted, inoperable control rods not in compliance with the sequence, to allow a limited number (i.e., eight) and distribution of fully inserted, inoperable control rods.<br>Insert B1 →<br>Rod pattern control satisfies the requirements of Criterion 3 of Reference 11. |
| LCO | Compliance with the prescribed control rod sequences minimizes the potential consequences of a CRDA by limiting the initial conditions to those consistent with the BPWS. This LCO only applies to OPERABLE control rods. For inoperable control rods required to be inserted, separate requirements are specified in LCO 3.1.3, "Control Rod OPERABILITY," consistent with the allowances for inoperable control rods in the BPWS. |
| APPLICABILITY | In MODES 1 and 2, when THERMAL POWER is ≤ 10% RTP, the CRDA is a Design Basis Accident (DBA) and, therefore, compliance with the assumptions of the safety analysis is required. When THERMAL POWER is > 10% RTP, there is no credible control rod configuration that results in a control rod worth that could exceed the 280 cal/gm fuel damage limit during a CRDA (Ref. 2). In MODES 3, 4, and 5, since the reactor is shut down and only a single control rod can be withdrawn from a core cell containing fuel assemblies, adequate SDM ensures that the consequences of a CRDA are acceptable, since the reactor will remain subcritical with a single control rod withdrawn. |

(continued)

INSERT B1

When performing a shutdown of the plant, an optional BPWS control rod sequence (Ref. 12) may be used provided that all withdrawn control rods have been confirmed to be coupled. The rods may be inserted without the need to stop at intermediate positions since the possibility of a CRDA is eliminated by the confirmation that withdrawn control rods are coupled. When using the Reference 12 control rod sequence for shutdown, the rod worth minimizer may be reprogrammed to enforce the requirements of the improved control rod insertion process, or bypassed in accordance with the allowance provided in the Applicability Note for the Rod Worth Minimizer in Table 3.3.2.1-1.

In order to use the Reference 12 BPWS shutdown process, an extra check is required in order to consider a control rod to be "confirmed" to be coupled. This extra check ensures that no Single Operator Error can result in an incorrect coupling check. For purposes of this shutdown process, the method for confirming that control rods are coupled varies depending on the position of the control rod in the core. Details on this coupling confirmation requirement are provided in Reference 12. If the requirements for use of the BPWS control rod insertion process contained in Reference 12 are followed, the plant is considered to be in compliance with BPWS requirements, as required by LCO 3.1.6.

BASES

REFERENCES (continued)

5. NUREG-0800, "Standard Review Plan," Section 15.4.9, "Radiological Consequences of Control Rod Drop Accident (BWR)," Revision 2, July 1981.

6. 10 CFR 100.11, "Determination of Exclusion Area Low Population Zone and Population Center Distance."

7. NEDO-10527, "Rod Drop Accident Analysis for Large BWRs," (including Supplements 1 and 2), March 1972.

8. NEDO-21778-A, "Transient Pressure Rises Affected Fracture Toughness Requirements for Boiling Water Reactors," December 1978.

9. ASME, Boiler and Pressure Vessel Code.

10. NEDO-21231, "Banked Position Withdrawal Sequence," January 1977.

Insert B2 →

11. 10 CFR 50.36(c)(2)(ii).

INSERT B2

12. NEDO-33091-A, Revision 2, "Improved BPWS Control Rod Insertion Process," July 2004.

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

1. Rod Block Monitor (continued)

conservatively derived trip setpoints are used. In addition, both the Allowable Values and trip setpoints may have additional conservatisms.

The RBM is assumed to mitigate the consequences of an RWE event when operating ≥ 30% RTP and a peripheral control rod is not selected. Below this power level, or if a peripheral control rod is selected, the consequences of an RWE event will not exceed the MCPR SL and, therefore, the RBM is not required to be OPERABLE (Ref. 4).

2. Rod Worth Minimizer

The RWM enforces the banked position withdrawal sequence (BPWS) to ensure that the initial conditions of the CRDA analysis are not violated. The analytical methods and assumptions used in evaluating the CRDA are summarized in Insert B3 → Reference 5. The BPWS requires that control rods be moved in groups, with all control rods assigned to a specific group required to be within specified banked positions. Requirements that the control rod sequence is in compliance with the BPWS are specified in LCO 3.1.6, "Rod Pattern Control."

Insert B4 →

The RWM Function satisfies Criterion 3 of Reference 3.

Since the RWM is a system designed to act as a backup to operator control of the rod sequences, only one channel of the RWM is available and required to be OPERABLE (Ref. 6). Special circumstances provided for in the Required Action of LCO 3.1.3, "Control Rod OPERABILITY," and LCO 3.1.6 may necessitate bypassing the RWM to allow continued operation with inoperable control rods, or to allow correction of a control rod pattern not in compliance with the BPWS. The RWM may be bypassed as required by these conditions, but then it must be considered inoperable and the Required Actions of this LCO followed.

Compliance with the BPWS, and therefore OPERABILITY of the RWM, is required in MODES 1 and 2 when THERMAL POWER is ≤ 10% RTP. When THERMAL POWER is > 10% RTP, there is no possible control rod configuration that results in a control rod worth that could exceed the 280 cal/gm fuel damage limit during a CRDA (Ref. 5). In MODES 3 and 4, all control rods are required to be inserted into the core; therefore, a CRDA

(continued)

INSERT B3

References 5 and 9. The standard

INSERT B4

When performing a shutdown of the plant, an optional BPWS control rod sequence (Ref. 9) may be used if the coupling of each withdrawn control rod has been confirmed. The rods may be inserted without the need to stop at intermediate positions. When using the Reference 9 control rod insertion sequence for shutdown, the rod worth minimizer may be reprogrammed to enforce the requirements of the improved BPWS control rod insertion process, or it can be bypassed if it is not programmed to reflect the optional BPWS sequence, as permitted by the Applicability Note for the RWM in Table 3.3.2.1-1.

BASES

REFERENCES (continued)

7. GENE-770-06-1-A, "Addendum To Bases For Changes To Surveillance Test Intervals And Allowed Out-of-Service Times For Selected Instrumentation Technical Specifications," December 1992.

8. NEDC-32410-P-A, "Nuclear Measurement Analysis and Control Power Range Neutron Monitor (NUMAC-PRNM) Retrofit Plus Option III Stability Trip Function," October 1995.

Insert B5 →

INSERT B5

9. NEDO-33091-A, Revision 2, "Improved BPWS Control Rod Insertion Process," July 2004.