UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

November 13, 2009

Mr. Samuel L. Belcher
Vice President Nine Mile Point
Nine Mile Point Nuclear Station, LLC
P.O. Box 63
Lycoming, NY 13093

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION REGARDING NINE MILE POINT NUCLEAR STATION, UNIT NO. 2 – RE: THE LICENSE AMENDMENT REQUEST FOR EXTENDED POWER UPRATE OPERATION (TAC NO. ME1476)

Dear Mr. Belcher:

By letter dated May 27, 2009, as supplemented on August 28, 2009, Nine Mile Point Nuclear Station, LLC, submitted for Nuclear Regulatory Commission (NRC) staff review and approval, a proposed license amendment requesting an increase in the maximum steady-state power level from 3467 megawatts thermal (MWt) to 3988 MWt for Nine Mile Point, Unit No. 2 extended power uprate operation.

The NRC staff is reviewing the information provided in that letter and has determined that additional information is needed to support its review. Enclosed is the NRC staff's request for additional information (RAI). The RAI was discussed with your staff on October 30, November 4, and November 5, 2009, and it was agreed that your response would be provided within 45 days from the date of this letter.

Sincerely,

Douglas V Pickett for

Richard V. Guzman, Senior Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-410

Enclosure:
As stated

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REQUEST FOR ADDITIONAL INFORMATION (RAI)

NINE MILE POINT NUCLEAR STATION, LLC

NINE MILE POINT, UNIT NO. 2 (NMP2)

LICENSE AMENDMENT REQUEST RE: EXTENDED POWER UPRATE (EPU)

DOCKET NO. 50-410

The Nuclear Regulatory Commission (NRC) staff is reviewing the Nine Mile Point Nuclear Station, LLC (NMPNS or the licensee) license amendment request (LAR) application dated May 27, 2009, as supplemented on August 28, 2009. The NRC staff has determined that additional information requested below will be needed to support its review.

A. Mechanical & Civil Engineering – Steam Dryer Evaluation

1. In the executive summary report (Attachment 13.0) and in the executive summary and references of the Continuum Dynamics, Inc. (CDI) Report 09-26P, "Stress Assessment of Nine Mile Point Unit 2 Steam Dryer at CLTP [Current Licensed Thermal Power] and EPU Conditions," the licensee refers to the Boiling Water Reactor Vessel and Internals Project (BWRVIP) -194 Report, "BWR Vessel and Internals Project, Methodologies for Demonstrating Steam Dryer Integrity for Power Uprate." The licensee also states that the steam dryer integrity analysis has followed the guidelines outlined in this report. The licensee is requested to omit references to the BWRVIP-194 Topical Report, "Methodologies for Demonstrating Steam Dryer Integrity for Power Uprate," in its application, as it has neither been reviewed nor approved by the NRC staff. The licensee is requested to supplement the necessary information as stand-alone information in the EPU application rather than referencing the topical report that is not yet endorsed by the NRC.

   In Attachments 13 and 13.1, the licensee references BWRVIP Topical Reports, BWRVIP-181, "Steam Dryer Repair Design Criteria," and BWRVIP-182, "Guidance for Demonstration of Steam Dryer Integrity for Power Uprate," that have not been reviewed nor approved by the staff. These topical reports are currently being reviewed by the staff. Reference to such unapproved documents is not acceptable. The licensee is requested to supplement the necessary information as stand-alone information in the EPU application rather than referencing the topical reports that are not yet endorsed by the NRC.

2. Table 4 in SIA Calculation NMP-26Q-302R0 (Attachment 13.4) presents the frequencies of the peaks which were removed from the strain gage power spectra. Some of these peaks are identified to be related to the pump vane pass frequencies, but others are referred to as "non-identified sources." The licensee is requested to include in its submittal, the rationale of filtering these spectral peaks for which the sources have not been identified.

3: In CDI Report No. 08-08P, "Acoustic and Low Frequency Hydrodynamic Loads at CLTP Power Level on Nine Mile Point, Unit 2 Steam Dryer to 250 Hz.," the Electrical Interference Check (EIC) signals are filtered out from the CLTP signals to estimate the

dryer load by means of the Acoustic Circuit Model (ACM), Rev. 4. However, the EIC signals are not provided in CDI Report No. 08-08P. The licensee is requested to revise this report to include:

(a) CLTP signals at all locations on the main steam lines (MSLs), before subtracting the EIC signals,

(b) The EIC signals at all locations for CLTP condition, and

(c) CLTP signals after subtracting the EIC signals.

The licensee is requested to provide this information in the form of overlapping power spectral density (PSD) plots for each location, separately, to facilitate comparisons between the various signals.

4. Attachment 13.2 (CDI Report 08-08P Rev.1) provides sample level 1 and level 2 limit curves for MSL-A upper and lower locations. The licensee is requested to:

(a) describe what is meant by sample limit curves;

(b) clarify if the sample limit curves are NMP2 specific limit curves; and

(c) provide the limit curves for all four NMP2 MSL lines.

5. Appendix-A of CDI Report 09-26P describes the methodology used for submodeling the four locations with the stress reduction factors (SRFs) ranging from 0.62 to 0.88. Item 6 of Table 7 of CDI Report 09-26P lists an SRF of 0.79, but does not describe the submodeling methodology used for the location of the bottom of the hood/hood support weld at junctions of the base plate. The licensee is requested to address and clarify whether the submodeling methodology used for this location is the same as in Appendix-A, or discuss whether a non-standard submodeling approach was used. Also, the licensee is requested to provide a discussion of whether the forces and displacements at the cut boundary of the global shell model were imported to the solid submodel. The NRC staff does not endorse non-standard and unconventional submodeling approaches that use non-unique and arbitrary loading or displacements along with some arbitrary boundary conditions, to establish the applicable SRF value.

B. Piping & Non-Destructive Examination (NDE)

1. Table 2.1.4 of NEDO-33351 provides a summary of Category D and E dissimilar metal welds.

a) Please provide information on Category B and C welds, if any, and provide information concerning the stress improvement process and the size of the cracks determined by the subsequent examination.

b) Please describe the disposition of Category E welds listed in the table, whether they have been reinforced by weld overlay or mitigated by stress improvement treatment, and the size of the defects determined by the subsequent examination.

c) For all welds other than Category A welds, describe the augmented inspection programs and discuss their adequacy in light of the EPU.

2. Oxygen content in the coolant is expected to increase due to increased radiolysis of water resulting from the EPU. Since hydrogen water chemistry (HWC) is being employed, describe how the electrochemical potential measurements will be made to ensure that the hydrogen injection rate is adequate to maintain the effectiveness of HWC at the most limiting locations.

C. Chemical Engineering

1. Table 2.1-5 of NEDO-33351P, "Safety Analysis Report for Nine Mile Point Nuclear Station Unit 2 Constant Pressure Power Uprate (PUSAR)," shows several entries where the predicted flow accelerated corrosion wear rate due to the power uprate using CHECWORKS™ decreases. For many of these entries, temperature and velocity increase, and oxygen is unchanged or decreases between current and EPU conditions. Examples include, "Cond Htr 5 to Header," and "FW Pmp To Balance Ln." Please discuss the reasons for the predicted decrease in flow-accelerated corrosion.

D. Fire Protection

1. Attachment 11 to NEDC-3335 IP Revision 0, Section 2.5.1.4, "Fire Protection," states that "...Any changes in physical plant configuration or combustible loading as a result of modifications to implement the extended power uprate (EPU) will be evaluated in accordance with plant modification and fire protection programs..." Clarify whether this request involves plant modifications or physical changes to the fire protection program. If any, the staff requests the licensee to identify proposed modifications and discuss impact of these modifications on plant's compliance with fire protection program licensing basis, Title 10 of the *Code of Federal Regulations* (10 CFR) 50.48, or applicable portions of 10 CFR Part 50, Appendix R.

2. The NRC staff notes that Attachment 11 to NEDC-3335 IP Revision 0, Section 2.5.1.4, "Fire Protection," states that "...The safe shutdown systems and equipment used to achieve and maintain cold shutdown conditions do not change, and are adequate for EPU conditions. The operator actions required to maintain the consequences of a fire are defined..." The NRC staff requests the licensee to verify that additional heat in the plant environment from the EPU will not (1) interfere with required operator manual actions being performed at their designated time, or (2) require any new operator actions to maintain hot shutdown and then place the reactor in a cold shutdown condition.

3. The NRC staff notes that Attachment 11 to NEDC-3335 IP Revision 0, Section 2.5.1.4, "Fire Protection," states that "...The results show that the peak fuel cladding temperature, reactor pressure and containment pressures and temperatures are below the acceptance limits and demonstrate that there is sufficient time for the operator to perform the necessary actions to achieve and maintain cold shutdown conditions..." The NRC staff requests the licensee to discuss the operator action response time, including any assumptions that may have been made in determining that the operator manual actions are feasible and reliable and can be accomplished to achieve and maintain hot and then cold shutdown condition.

4. The NRC staff notes that Attachment 11 to NEDC-3335 IP Revision 0, Section 2.5.1.4.1, "10 CFR 50 Appendix R Fire Event," states that "...The results of Appendix R evaluation for CLTP and EPU provided in Table 2.5-1 and Figures 2.5-1 through 2.5-4 demonstrate that the fuel cladding integrity, reactor vessel integrity, and containment integrity are maintained and that sufficient time is available for the operator to perform the necessary actions...". The NRC staff requests the licensee to provide actual time for the operator to perform the necessary actions, including the anticipated "time margin" between when the actions are completed and when any thermal-hydraulic constraints are likely to be reached.

5. The results of the Appendix R evaluation for CLTP and EPU are provided in Table 2.5-1 and Figures 2.5-1 through 2.5-4. The NRC staff notes in Table 2.5-1 that at EPU condition, there is an increase in the suppression pool bulk temperature of 198.1 °F, 9.5 °F above the current suppression pool bulk temperature of 188.6 °F. Do the NMPNS Unit 2 safe shutdown instructions credit any operator manual action in the secondary containment? If any, discuss how this operator manual action can be accomplished within the available time at higher suppression pool bulk temperature (e.g., manually opening the main steam relief valves). In addition, if a low-pressure coolant injection (LPCI) pump is used for safe-shutdown for NMP2, how does the licensee ensure adequate net positive suction head (NPSH) available to the LPCI pump throughout the Appendix R event?

6. Some plants credit aspects of their fire protection system for purposes other than fire protection activities, e.g., utilizing the fire water pumps and water supply as backup cooling or inventory for non-primary reactor systems. If the NMPNS, Unit 2, credits its fire protection system in this way, the EPU LAR should identify the specific situations and discuss to what extent, if any, the EPU affects these "non-fire-protection" aspects of the plant fire protection system. If NMP2 does not take such credit, the NRC staff requests that the licensee verify this as well.

E. Instrumentation & Controls

1. Regarding the setpoints below, provide documentation of the methodology used for establishing the limiting setpoint (or NSP) and the limiting acceptable values for the As-Found and As-Left setpoints as measured in periodic surveillance testing. Indicate the related Analytical Limits and other limiting design values (and the sources of these values).

   - Average Power Range Monitor Flow Biased Simulated Thermal Power- Upscale
   - Main Steam Line Flow - High

2. For non-SL-related setpoint, "Main Steam Line Flow – High", describe the measures to be taken to ensure that the associated instrument channel is capable of performing its specified safety functions in accordance with applicable design requirements and associated analyses. Include in your discussion information on the controls you employ to ensure that the as-left trip setting after completion of periodic surveillance is consistent with your setpoint methodology. Also, discuss the plant corrective action processes (including plant procedures) for restoring channels to operable status when channels are determined to be "inoperable" or "operable but degraded." If the controls

are located in a document other than the Technical Specifications (e.g., plant test procedure), describe how it is ensured that the controls will be implemented.

F. Containment & Ventilation

1. NEDC-33351P Rev. 0 Section 2.2.1 states that the EPU has no effect on the mass and energy released from a high energy line break (HELB) in a steam line. Provide clarification, or reference, previously submitted documentation that justifies why EPU increased steam flow rates will not increase the mass or energy release from a HELB in a steam line. If a flow restricting nozzle or orifice is the justification, provide verification that a break cannot occur between the flow restrictor and the reactor vessel.

2. NEDC-33351P Rev. 0 Section 2.2.1 states that the results of the NMP2 evaluation of HELBs are provided in Table 2.2-1. Table 2.2-1 is for liquid line breaks. Please provide the table that provides the results for HELBs from steam line breaks.

3. Where is the location of the break used to calculate the design basis loss-of-coolant accident (DBLOCA) peak values provided in Table 2.6-1?

4. The sub-compartment pressurization evaluation for the drywell head is based on a postulated break in the reactor core isolation cooling (RCIC) head spray line. Provide a discussion or reference a previously docketed discussion that documents a break in the RCIC head spray line is the limiting break for the drywell head sub-compartment pressurization.

5. Section 4.5, page 2-258, is the radioiodine inventory indicated the same as the iodine loading on the standby gas treatment system (SGTS) charcoal adsorber?

6. Provide the SGTS charcoal adsorber loading in terms of milligrams radioiodine per grams of activated carbon.

7. Section 4.5 provides a maximum component temperature with the higher iodine inventory. Is the component in discussion the SGTS high efficiency particulate air, the charcoal adsorber, or both? Is the temperature based on local air temperature, radioiodine decay heat, or a combination of both?

8. Table 2.5-2 provides SGTS radioiodine removal capacity parameters. It is not clear if the parameters are for all trains or for one train. Is the mass of activated carbon for each filtration train? How many charcoal adsorber modules are installed in each SGTS filter train? Is the maximum charcoal adsorber temperature indicated based on radioiodine decay heat at minimum specified airflow (or no airflow)?

9. The reactor power listed in Table 2.5-2 does not match the proposed power uprate to 4067 MWt. Provide an updated Table 2.5-2, "SGTS Iodine Removal Capacity Parameters" based on the requested 4067 MWt reactor power.

10. Section 2.5.2.1, page 2-178 and Table 2.5-2 discuss the charcoal adsorber temperature with minimum airflow. The discussion on page 2-178 provides the adsorber temperature with "a failed fan with minimum cooling flow." Provide a discussion or reference a previously docketed discussion that provides assurance minimum cooling will be

maintained with a failed fan. If the alternate SGTS train provides minimum airflow, discuss:

a) If damper manipulation is required to provide minimum air flow (manual, automatic, or both);

b) Control Room indications that minimum cooling airflow is required and maintained;

c) If any manual actions to assure minimum air flow are addressed in the emergency operating procedures;

d) The impact of minimum cooling flow on the operating SGTS train.

11. What will be the maximum temperature maintained in the drywell during extended power operation? How does this compare with the initial temperature assumed for the drywell for containment accident analysis?

G. Component Performance & Testing

1. The first paragraph of Section 2.2.4 states that NMP2 evaluated the lessons learned from the motor-operated valve (MOV) program and applied those lessons learned to other safety-related power-operated valves. Please provide specific examples of the lessons learned from the MOV program that were applied to other safety-related power-operated valves.

2. The last paragraph of Section 2.2.4.2 discusses Generic Letter 95-07 and states that MOVs were modified to provide mitigation of pressure-locking occurrences. Please discuss if a thrust-prediction methodology is used to demonstrate that valves 2ICS*MOV 122, RCIC Steam Exhaust to Suppression Pool, and 1ICS*MOV128, RCIC Steam Supply Inboard Isolation, are capable of opening during pressure-locking conditions. Please explain if the increase in suppression pool temperature due to EPU could effect the pressure-locking calculation for 2ICS*MOV 122 if a thrust-prediction methodology is used to demonstrate that this valve is capable of operating during pressure-locking conditions.

3. The Technical Evaluation in Section 2.8.4.5 states that there is 31.6 psi margin between the maximum reactor upper plenum and the standby liquid control system (SLCS) pump relief valve setpoint. This 31.6 psi margin includes a SLCS pump relief valve setpoint tolerance of 3% but it appears that the margin does not include an overall combined accuracy of the instrumentation used to perform the SLCS pump relief valve setpoint test. Please explain how the overall combined accuracy of the instrumentation used to perform SLCS pump relief valve setpoint tests was accounted for when calculating the margin between the maximum reactor upper plenum and the SLCS pump relief valve setpoint.

4. The Technical Evaluation in Section 2.8.4.5 states that the SLCS pump relief valves are periodically tested. Please verify that as-found setpoint test history for the SLCS pump relief valves demonstrates that the SLCS pump relief valves were consistently within the 3% tolerance.

November 13, 2009

Mr. Samuel L. Belcher
Vice President Nine Mile Point
Nine Mile Point Nuclear Station, LLC
P.O. Box 63
Lycoming, NY 13093

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Sincerely,

***/RA/***
Richard V. Guzman, Senior Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-410

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As stated

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