



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

May 26, 2015

Mr. Peter M. Orphanos
Site Vice President – Nine Mile Point Nuclear Station
Exelon Generation Company, LLC
348 Lake Road
Oswego, New York 13126

SUBJECT: NINE MILE POINT NUCLEAR STATION, UNIT 2 - ISSUANCE OF
AMENDMENT RE: PRIMARY CONTAINMENT ISOLATION
INSTRUMENTATION TECHNICAL SPECIFICATION ALLOWABLE VALUE
CHANGE (TAC NO. MF5193)

Dear Mr. Orphanos:

The Commission has issued the enclosed Amendment No. 147 to Renewed Facility Operating License No. NPF-69 for the Nine Mile Point Nuclear Station, Unit No. 2 (NMP2). The amendment consists of changes to the Technical Specifications (TSs) in response to your application transmitted by letter dated November 17, 2014, as supplemented by letter dated March 20, 2015.

The amendment revised the NMP2 TS Allowable Value for the Main Steam Line Tunnel Lead Enclosure Temperature-High instrumentation from an ambient temperature dependent (variable setpoint) to ambient temperature independent (constant Allowable Value). The changes deleted Surveillance Requirement (SR) 3.3.6.1.2 and revise the Allowable Value for Function 1.g on Table 3.3.6.1-1, "Primary Containment Isolation Instrumentation."

A copy of the related Safety Evaluation is enclosed. A Notice of Issuance will be included in the Commission's next regular biweekly *Federal Register* notice.

Sincerely,

A handwritten signature in black ink that reads "Brenda Mozafari".

Brenda Mozafari, Senior Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-410

Enclosures:

1. Amendment No. 147 to NPF-69
2. Safety Evaluation

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

NINE MILE POINT NUCLEAR STATION, LLC

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-410

NINE MILE POINT NUCLEAR STATION, UNIT 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 147
Renewed License No. NPF-69

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Exelon Generation Company, LLC (Exelon, the licensee), dated November 17, 2014, as supplemented by letter dated March 20, 2015, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-69 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, as revised through Amendment No. 147, are hereby incorporated into this license. Exelon Generation Company, LLC shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 60 days.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink, appearing to read "Michael I. Dudek", is written over a horizontal line.

Michael I. Dudek, Acting Chief
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the License and Technical
Specifications

Date of Issuance: May 26, 2015

ATTACHMENT TO LICENSE AMENDMENT NO. 147
TO RENEWED FACILITY OPERATING LICENSE NO. NPF-69
DOCKET NO. 50-410

Replace the following page of the Renewed Facility Operating License with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

Remove Page

Page 4

Insert Page

Page 4

Replace the following pages of Appendix A, Technical Specifications, with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove Pages

TS 3.3.6.1-4

TS 3.3.6.1-6

Insert Pages

TS 3.3.6.1-4

TS 3.3.6.1-6

(1) Maximum Power Level

Exelon Generation is authorized to operate the facility at reactor core power levels not in excess of 3988 megawatts thermal (100 percent rated power) in accordance with the conditions specified herein.

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, as revised through Amendment No. are hereby incorporated into this license. Exelon Generation shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

(3) Fuel Storage and Handling (Section 9.1, SSER 4)*

- a. Fuel assemblies, when stored in their shipping containers, shall be stacked no more than three containers high.
- b. When not in the reactor vessel, no more than three fuel assemblies shall be allowed outside of their shipping containers or storage racks in the New Fuel Vault or Spent Fuel Storage Facility.
- c. The above three fuel assemblies shall maintain a minimum edge-to-edge spacing of twelve (12) inches from the shipping container array and approved storage rack locations.
- d. The New Fuel Storage Vault shall have no more than ten fresh fuel assemblies uncovered at any one time.

(4) Turbine System Maintenance Program (Section 3.5.1.3.10, SER)

The operating licensee shall submit for NRC approval by October 31, 1989, a turbine system maintenance program based on the manufacturer's calculations of missile generation probabilities. (Submitted by NMPC letter dated October 30, 1989 from C.D. Terry and approved by NRC letter dated March 15, 1990 from Robert Martin to Mr. Lawrence Burkhardt, III).

* The parenthetical notation following the title of many license conditions denotes the section of the Safety Evaluation Report (SER) and/or its supplements wherein the license condition is discussed.

SURVEILLANCE REQUIREMENTS

- NOTES-----
1. Refer to Table 3.3.6.1-1 to determine which SRs apply for each Primary Containment Isolation Function.
 2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains isolation capability.
-

SURVEILLANCE		FREQUENCY
SR 3.3.6.1.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.6.1.2	Deleted	
SR 3.3.6.1.3	Perform CHANNEL FUNCTIONAL TEST.	92 days
SR 3.3.6.1.4	Calibrate the trip unit.	92 days
SR 3.3.6.1.5	Perform CHANNEL CALIBRATION.	24 months
SR 3.3.6.1.6	Perform LOGIC SYSTEM FUNCTIONAL TEST.	24 months

(continued)

Primary Containment Isolation Instrumentation
3.3.6.1

Table 3.3.6.1-1 (page 1 of 5)
Primary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Main Steam Line Isolation					
a. Reactor Vessel Water Level – Low Low Low, Level 1	1,2,3	2	D	SR 3.3.6.1.1 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5 SR 3.3.6.1.6 SR 3.3.6.1.7	≥ 10.8 inches
b. Main Steam Line Pressure – Low	1	2	E	SR 3.3.6.1.1 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5 SR 3.3.6.1.6 SR 3.3.6.1.7	≥ 746 psig
c. Main Steam Line Flow – High	1,2,3	2 per MSL	D	SR 3.3.6.1.1 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5 SR 3.3.6.1.6 SR 3.3.6.1.7	≤ 184.4 psid
d. Condenser Vacuum – Low	1,2(a), 3(a)	2	D	SR 3.3.6.1.1 SR 3.3.6.1.3 SR 3.3.6.1.4 SR 3.3.6.1.5 SR 3.3.6.1.6	≥ 7.6 inches Hg vacuum
e. Main Steam Line Tunnel Temperature – High	1,2,3	2	D	SR 3.3.6.1.1 SR 3.3.6.1.3 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ 170.6°F
f. Main Steam Line Tunnel Differential Temperature – High	1,2,3	2	D	SR 3.3.6.1.1 SR 3.3.6.1.3 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ 71.7°F
g. Main Steam Line Tunnel Lead Enclosure Temperature – High	1,2,3	2 per area	D	SR 3.3.6.1.1 SR 3.3.6.1.3 SR 3.3.6.1.5 SR 3.3.6.1.6	≤ 175.6°F
h. Manual Initiation	1,2,3	4	G	SR 3.3.6.1.6	NA

(continued)

(a) With any turbine stop valve not closed.



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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 147

TO RENEWED FACILITY OPERATING LICENSE NO. NPF-69

NINE MILE POINT NUCLEAR STATION, LLC

EXELON GENERATION COMPANY, LLC.

DOCKET NO. 50-410

NINE MILE POINT NUCLEAR STATION, UNIT 2

1.0 INTRODUCTION

By letter dated November 17, 2014 (Reference 1), as supplemented by letter dated March 20, 2015 (Reference 2), Exelon Generation Company, LLC (Exelon, the licensee), submitted a request for changes to the Nine Mile Point Nuclear Station, Unit No. 2, Technical Specifications (TSs).

The proposed amendment would revise the NMP2 TS Allowable Value (AV) for the Main Steam Line Tunnel Lead Enclosure (MSLTLE) Temperature-High instrumentation from an ambient temperature dependent (variable setpoint) to ambient temperature independent (constant AV). The changes would also delete Surveillance Requirement (SR) 3.3.6.1.2 and revise the Allowable Value for Function 1.g on Table 3.3.6.1-1, "Primary Containment Isolation Instrumentation."

The supplement dated March 20, 2015, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the U.S. Nuclear Regulatory Commission (NRC) staff's initial proposed no significant hazards consideration determination noticed in the *Federal Register* on March 3, 2015 (80 FR 11476).

In its application, the licensee stated that the proposed changes, when implemented, will help enhance plant reliability by reducing the risk of a plant trip due to reduction in recalibration required for the current variable setpoint. The variable setpoint is based on seasonal changes and requires recalibration in winter and summer months; however, the fixed setpoint does not require seasonal setpoint changes. In addition, the proposed changes will improve the as low as reasonably achievable (ALARA) dose goals and the industrial safety risk by minimizing the station personnel entries into the high-energy steam piping environment.

2.0 REGULATORY EVALUATION

The regulatory requirements and guidance, which the NRC staff considered in its review of the License Amendment Request (LAR), are as follows:

- (A) Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50 Section 36(c) "Technical specifications" requires that the TSs include items in the following categories: (1) safety limits, limiting safety systems settings, and limiting control settings; (2) limiting conditions for operation (LCOs); (3) surveillance requirements; (4) design features, and (5) administrative controls. The regulation states, "Limiting safety system settings for nuclear reactors are settings for automatic protective devices related to those variables having significant safety functions." The regulation also states, "Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the LCOs will be met."
- (B) In 10 CFR 50.67, "Accident source term" it states that:
 - (i) An individual located at any point on the boundary of the exclusion area for any 2-hour period following the onset of the postulated fission product release, would not receive a radiation dose in excess of 0.25 Sv (25 rem) total effective dose equivalent (TEDE),
 - (ii) An individual located at any point on the outer boundary of the low population zone, who is exposed to the radioactive cloud resulting from the postulated fission product release (during the entire period of its passage), would not receive a radiation dose in excess of 0.25 Sv (25 rem) TEDE,
 - (iii) Adequate radiation protection is provided to permit access to and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 0.05 Sv (5 rem) TEDE for the duration of the accident.
- (C) Regulatory Guide (RG) 1.105, Revision 2, "Instrument Setpoints for Safety-Related Systems" (Reference 3), describes a method acceptable to the NRC staff for complying with the NRC's regulations for ensuring setpoints for safety-related instrumentation are initially within, and remain within the TS limits.
- (D) Regulatory Guide 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," Rev. 0, July 2000 (Reference 4), provides the methodology for analyzing the radiological consequences of several design basis accidents to show compliance with 10 CFR 50.67. The RG 1.183 provides guidance to licensees on acceptable application of alternate source term (AST, also known as accident source term) submittals, including acceptable radiological analysis assumptions for use in conjunction with the accepted AST.
- (E) NUREG-0800, "Standard Review Plan [SRP] for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition" (Reference 5), Section 15.0.1, "Radiological Consequence Analyses Using Alternative Source Terms,"

Rev. 0, July 2000, provides guidance to the staff for the review of alternative source term amendment requests. SRP 15.0.1 states that the NRC reviewer should evaluate the proposed change against the guidance in RG 1.183. The dose acceptance criteria for the main steam line break (MSLB) accident with fuel damage or a pre-incident spike is a TEDE of 25 rem at the exclusion area boundary (EAB) for the maximum 2-hour period and at the outer boundary of the low population zone (LPZ) during the entire period of the postulated radioactive cloud passage. The dose acceptance criteria for the MSLB accident with equilibrium iodine activity is a TEDE of 2.5 rem at the EAB for the maximum 2-hour period and at the outer boundary of the LPZ during the entire period of the postulated radioactive cloud passage. The NRC staff also considered relevant information in the NMP2 Updated Safety Analysis Report (USAR) (Reference 6).

- (F) License Amendment 125, dated May 29, 2008 (ADAMS Accession No. ML081230439), "Nine Mile Point Nuclear Station, Unit 2 - Issuance of Amendment, Re: Implementation of Alternative radiological Source Term (TAC No. MD5758)" (Reference 7), used an AST methodology for analyzing the radiological consequences of four design-basis accidents using RG 1.183. The main steam line break accident was one of the design-basis accidents analyzed.

- (G) Appendix A to 10 CFR Part 50, "General Design Criteria (GDC):"

- Criterion 19, "Control room," states:

A control room shall be provided from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain it in a safe condition under accident conditions, including loss-of-coolant accidents. Adequate radiation protection shall be provided to permit access and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 5 rem [0.05 Sv] whole body, or its equivalent to any part of the body, for the duration of the accident. Equipment at appropriate locations outside the control room shall be provided (1) with a design capability for prompt hot shutdown of the reactor, including necessary instrumentation and controls to maintain the unit in a safe condition during hot shutdown, and (2) with a potential capability for subsequent cold shutdown of the reactor through the use of suitable procedures.

- In 10 CFR Part 50 Appendix A, GDC 13, "Instrumentation and control," requires, in part, instrumentation be provided to monitor variables and systems, and controls are provided to maintain these variables and systems within prescribed operating ranges.
- In 10 CFR Part 50 Appendix A, GDC 20, "Protection system functions," requires, in part, the protection system be designed to initiate automatically the operation of appropriate systems, including the reactivity control systems, to assure specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences.

- 10 CFR Part 50 Appendix A, GDC 30, "Quality of reactor coolant pressure boundary," requires, in part, means shall be provided for detecting and, to the extent practical, identifying the location of the source of reactor coolant leakage.

The regulatory requirements from which the NRC staff based its acceptance are the reference values in 10 CFR 50.67, the accident specific guideline values in Regulatory Position 4.4 of RG 1.183, and Table 1 of SRP Section 15.0.1.

Precedents:

There are four precedents since the 1992 Susquehanna license amendment for the Leak Detection Function in the Turbine Building Main Steam Tunnel (Reference 8) which changed the leakage basis from a 25 gallons per minute (gpm) leak to a 65 gpm leak during winter operation with an isolation setpoint change from 117°F to 197°F. In 1996, the LaSalle license amendment (Reference 9) approved a setpoint change for the Main Steam Tunnel Differential-High isolation signal from $\leq 36^{\circ}\text{F}$ to $\leq 65^{\circ}\text{F}$. In 2004, Perry's license amendment (Reference 10) changed the MSL Turbine Building Temperature-High setpoint from 138.9°F to 149.6°F and an equivalent steam leakage value of 25 gpm to 280 gpm. In a similar precedent, a River Bend license amendment (Reference 11) changed the AV in the Primary Containment and Drywell Isolation Instrumentation TS from $\leq 148.5^{\circ}\text{F}$ to $\leq 183.0^{\circ}\text{F}$.

3.0 TECHNICAL EVALUATION

3.1 Technical Evaluation - Containment

Nine Mile Point, Unit 2, is a General Electric (GE) Boiling Water Reactor (BWR)/5 reactor with Mark II pressure suppression containment.

3.1.1 Background

The requested change would revise the AV Temperature of the MSL Tunnel Lead Enclosure Temperature-High from variable ambient temperature dependent to a constant value. The constant AV will be $\leq 175.6^{\circ}\text{F}$ and is found in TSs Table 3.3.6.1-1, Function 1.g. The change to a constant value also allows the deletion of a SR that will no longer be necessary. TS SR 3.3.6.1.2, "Verify the actual ambient temperature reading for all OPERABLE channels is $\geq T_{\text{amb}}$," along with Footnote (b) from TS Table 3.3.6.1-1 is deleted.

The current Analytical Limit (AL) for the variable ambient temperature dependent setpoint was ranged from 156°F to 180°F. The licensee stated that the variability provided greater operational flexibility; however, there was reduced plant operational reliability with the higher potential for a plant trip and unnecessary plant shutdown. According to the licensee, the benefits of its request to use a constant AL value include enhancing plant operational reliability and reducing risk by minimizing the potential for a plant trip function and unnecessary plant shutdown. The change will also improve ALARA dose goals and reduce industrial safety risks by minimizing personnel entries into high-energy steam piping environments.

The purpose of the leak detection system instrumentation and controls is to detect and provide the signals necessary to isolate leakage from the reactor coolant pressure boundary before critical crack size leakage limits are exceeded. The critical crack size limits the pressure in the steam tunnel to preserve its integrity. The leakage limits were determined by the licensee using the Generation of Thermal-Hydraulic Information for Containments (GOTHIC) computer code. It was determined that a 45 gpm steam leak corresponded to the AL of 180°F.

3.1.2 Technical Specifications Change

There are two TS changes outlined in this LAR. The first TS change is the deletion of a SR in TS 3.3.6.1, Primary Containment Isolation Instrumentation. SR 3.3.6.1.2 currently states, "Verify the actual ambient temperature reading for all OPERABLE channels is $\geq T_{amb}$." This SR has a frequency of 12 hours and it contains the note, "Only required to be met when the AV is adjusted in accordance with Table 3.3.6.1-1, footnote (b)." SR 3.3.6.1.2 is being deleted in its entirety. The staff determined that this SR is no longer applicable because with the adoption of the LAR, the MSL Tunnel Lead Enclosure Temperature – High is a constant AV based on a sufficiently low ambient temperature.

The second TS change occurs in Table 3.3.6.1-1, Page 1 of 5, Function 1.g, MSL Tunnel Lead Enclosure Temperature-High. This table is also part of TS 3.3.6.1. Function 1.g is changed by deleting SR 3.3.6.1.2 from the SRs list, changing the AV from the current variable AV ($\leq 151.6^{\circ}\text{F}^{(b)}$ to $\leq 175.6^{\circ}\text{F}$) to a fixed new setpoint of $\leq 175.6^{\circ}\text{F}$, and deleting Footnote (b). Footnote (b) was used to determine the ambient temperature dependent AV and stated, " $151.6^{\circ}\text{F} + (0.6)(T_{amb} - 90^{\circ}\text{F})$ and $\leq 175.6^{\circ}\text{F}$ provided the absence of steam leaks in the MSL tunnel lead enclosure area is verified by visual inspection prior to establishing the Allowable Value." The staff determined that it is acceptable to change the table because the changes will align the table with the constant AV for MSLTLE Temperature-High which is the subject of this request.

3.1.3 Technical Specification Allowable Value Change

The current main steam tunnel lead enclosure temperature AV of $\leq 151.6^{\circ}\text{F}$ during the summer and $\leq 175.6^{\circ}\text{F}$ during the winter is based on the worst case operating conditions. The licensee has proposed AV $\leq 175.6^{\circ}\text{F}$ for the entire year. To justify use of a single AV throughout the year, the licensee revised the current licensing basis analysis which uses THREED computer code and developed a new model using GOTHIC computer code, version 8.

GOTHIC is the state-of-the-art general purpose thermal-hydraulics computer code maintained by Numerical Applications, Inc. (NAI), for the Electric Power Research Institute (EPRI) for performing containment analyses. GOTHIC is qualified under the NAI Quality Assurance (QA) program which conforms to the requirements of 10 CFR Part 50 Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," with error reporting in accordance with 10 CFR Part 21, "Reporting of Defects and Noncompliance." GOTHIC is widely used by the nuclear industry and applications of this code have been previously approved by the NRC staff on a case-by-case basis.

THREED is the Stone & Webster Engineering Corporation code used for the design basis model at NMP2. The THREED computer program is used to calculate the transient conditions

of pressure, temperature, and humidity in various subcompartments following a postulated rupture in a moderate or high-energy pipeline.

The licensee has benchmarked GOTHIC code results against THREED code. In response to the Division of Safety Systems, Containment and Ventilation Branch (SCVB) Request for Additional Information (RAI) -3, the licensee provided the benchmarking results as shown in Table 1 below. Using the initial conditions of initial temperature at 80°F, supply air temperature at 70°F and a 25 gpm steam leak, the temperature of two sections of interest were very similar between THREED and GOTHIC. In the first section, THREED computed a temperature of 283.2°F and GOTHIC computed 288.2°F. In the second section, THREED computed a temperature of 155.6°F and GOTHIC computed 156.1°F. Two additional calculations were completed for the second section with similar results:

Table 1: THREED and GOTHIC Results

Temperature	THREED	GOTHIC
80°F Initial & 70°F Supply Air	155.6°F	156.1°F
90°F Initial & 80°F Supply Air	158.3°F	158.0°F
130°F Initial & 90°F Supply Air	185.1°F	184.3°F

GOTHIC temperature predictions were essentially the same as THREED. The supporting GOTHIC analysis for the proposed change used the same set of initial conditions for the temperature, relative humidity and pressure, and the same physical characteristics of the main steam tunnel as the THREED analysis.

In response to SCVB-RAI-4, the licensee provided the most limiting initial temperatures used in the analysis for the winter and summer cases as shown in Tables 2 and 3 below.

Table 2: Winter Initial Conditions

Parameter	THREED	GOTHIC
Area Temperature	80°F	80°F
HVAC Supply Air	70°F	70°F

Table 3: Summer Initial Conditions

Parameter	THREED	GOTHIC
Area Temperature	130°F	130°F
HVAC Supply Air	90°F	90°F

To achieve the AV change, a change in the leak detection basis from 25 gpm to 45 gpm equivalent steam leakage is required for the lead enclosure. Other locations of the main steam tunnel will remain capable of detecting a 25 gpm equivalent steam leak. In order to reach 180°F during the winter, a 45 gpm leak rate was required. In the main steam tunnel lead enclosure, there are 12 ambient temperature sensors that will detect and isolate the primary containment at 45 gpm.

For the critical crack size leak rate, the licensee used the same approach as described in USAR Section 5.2.5.5.3, to determine the critical crack size of the MSL lead enclosure. The critical crack size was determined to be a longitudinal crack of approximately 37 inches with a

corresponding leak rate estimated to be greater than 450 gpm. The licensee concluded that the leakage detection system will isolate the MSL with adequate margin because the isolation setpoint is $1/10^{\text{th}}$ the critical leak rate.

In response to SCVB-RAI-1 (Reference 2), the licensee provided GOTHIC model electronic file with ".GTH" extension. The staff briefly reviewed and executed the file in NRC computer with GOTHIC computer code, version 8 and confirmed licensee's predicted AL of MSL tunnel lead enclosure temperature 181.4°F for a 45 gpm leak using the worst winter initial conditions. The predicted temperature is 1.4°F conservative with respect to the proposed AL. The staff did not review the input and assumptions in the file.

3.1.4 Summary – Technical Evaluation Containment

Based on the regulatory and technical evaluations above, the staff finds that the licensee has adequately addressed the request to change the TSs AV of the Primary Containment Isolation Instrumentation for the MSL Tunnel Lead Enclosure Temperature-High. The results of the proposed analysis demonstrate that the leak-tight integrity of the steam tunnel is adequately managed because the MSL will isolate prior to reaching critical crack size leakage rates. The staff finds that the licensee has adequately addressed the impact of this change.

3.2 Technical Evaluation - Instrumentation and Controls

Main steam lines at NMP2 are routed from the reactor building to the turbine building via the main steam line tunnel. The LAR used the terminology main steam line tunnel lead enclosure (MSLTLE) to describe the area where the sensors to monitor the tunnel temperature are located. However, neither the LAR nor any of the current plant licensing basis documents specifically identify or define the MSLTLE area. In response to a staff RAI, the licensee explained in its March 20, 2015, response (Reference 2), that the MSLTLE is the horizontal part of the MSL tunnel at elevation 292'-0" which lies between the reactor building and the turbine building. The licensee also stated the appropriate licensing documents including USAR (Reference 6) Sections 5.2.5.1.3, 5.2.5.2.2, and 7.3.1.1.2 would be updated as part of the USAR update.

A leakage detection system is provided in the MSLTLE to detect steam leakage from the MSLs. There are a total of 12 sensors to sense the temperature in the MSLTLE (2MSS*TE69A/B/C/D, 2MSS*TE70A/B/C/D, and 2MSS*TE71A/B/C/D) located in three different areas of the tunnel lead enclosure, with four sensors clustered in each of the three locations. Each sensor has an associated temperature switch (2MSS*TS1069A/B/C/D, 2MSS*TS1070A/B/C/D, and 2MSS*TS1071A/B/C/D) which actuate when the temperature rises above the setpoint and results in closing the Main Steam Isolation Valves (MSIVs).

The licensee has requested to change from a variable to a fixed AV value based on the following reasons: (1) the existing setpoint is a variable setpoint and it is changed seasonally to provide operating margin during the summer and winter months, (2) changing the temperature setpoint with the seasonal changes can potentially cause a half trip and even a plant trip due to MSIV closure and associated plant trip, (3) changing the temperature setpoint requires increased surveillance and increases the industrial risk by exposing personnel to higher temperatures, (4) this LAR change will also reduce the number of entries to the main steam line

tunnel lead enclosure area and will help in meeting the ALARA goals, and (5) the existing AL for the lead tunnel enclosure varies from 156°F to 180°F with the detectable steam leak rate of 25 gpm leakage (based on 8.35 lbm = 1 gallon) and is based on the initial lead enclosure temperature varying between 90°F to 130°F.

The LAR proposes to change the AV for the MSLTLE leak detection temperature setpoint from an ambient temperature dependent (AV varies from 151.6 to 175.6°F) to an ambient temperature independent (i.e., constant AV). The new temperature setpoint would be changed to the maximum currently allowed AV of 175.6°F per the TSs (Table 3.3.6.1-1, Function 1.g). To achieve this change, the leak detection basis requires revision from 25 to 45 gpm (equivalent steam) for the MSLTLE area only. Other locations in the main steam tunnel remain capable of detecting a 25 gpm equivalent steam leak. Per Section 5.2.5.5.3 of the NMP2 USAR the critical crack size leak rate for the 28 inch MSL with 1.339 inch nominal wall thickness is 450 gpm which is 10 times the leak detection setpoint. Based on this fact the setpoint for the detectable leak rate of 45 gpm is acceptable.

Due to the proposed increase in the steam flow setpoint from 25 gpm to 45 gpm, staff issued an RAI requesting the licensee to clarify any decrease in the safety margin. The licensee's response stated in its March 20, 2015, letter (Reference 2) that:

The Analytical Limit (AL) associated with the fixed 175.6°F Allowable Value (AV) remains the same as currently allowed, 180°F, by the setpoint analysis of record. Therefore, there is no change in the margin of safety as it relates to the instrument setpoints.

The worst case winter and summer temperatures with a 45 gpm leak rate may be above 180°F; however, the current AV of 175.6°F remains the same. This means a leakage of less than 45 gpm may cause tripping and isolating of the main steam lines. This is a conservative action from the protection point of view and is therefore acceptable. The temperature indicating switch setpoints are set high enough to prevent spurious isolations but are set low enough to detect a leak within the analyzed leak detection flow setting in the MSLTLE area.

When the temperature indicating switches reach the isolation temperature setpoint, an automatic isolation and alarm signal is generated. The isolation signal trips the MSL isolation valves and the alarm signal generates an alarm in the control room. These features meet the requirements of GDC 13 and GDC 20. In addition, the ability of the leak detection at low flow rate of 45 gpm compared with the flow rate of 450 gpm for a critical crack size leak rate in the 28 inch outside diameter steam pipe provides contingency and margin for a crack size large enough to propagate rapidly. The licensee's response of March 20, 2015 (Reference 2), explained the leak detection system detects the new leakage of 45 gpm for both the winter and the summer case. This feature meets the requirement of GDC 30.

The existing AV limit value has been selected as the new fixed AV. Therefore, there is no change to the setpoint calculation for the AV.

With regard to the increased radiological impact the licensee stated in its letter dated November 17, 2014 (Reference 1), that:

The increase in the steam leak rate has no impact on the radiological consequences associated with the Main Steam Line Break (MSLB) described in USAR Section 15.6.4, Steam System Piping Break Outside Containment. The radiological consequences (using the same source terms and dispersion factors used for the MSLB) associated with the 45 gpm steam leak for one hour is bounded by the MSLB described in USAR Section 15.6.4.

Since the peak temperature limit of 180°F in detecting a MSL break is the same as before there is no impact on equipment qualification.

Based on the reasoning stated above changing from a seasonally variable AV to a fixed AV for the MSIV closure logic is acceptable.

This change requires modification to TS Table 3.3.6.1-1, Primary Containment Isolation Instrumentation, Function 1.g., where the current variable setpoint will be modified to the new fixed AV of ≤175.6°F. The associated footnote (b) in Table 3.3.6.1-1 will also be deleted. Based on the technical review discussed above this change in TS is acceptable.

The licensee also proposes SR 3.3.6.1.2 be deleted. This SR requires the AV be adjusted in accordance with Table 3.3.6.1-1, footnote (b). This footnote requires the licensee perform a visual inspection to confirm absence of steam leaks in the MSLTLE area visually prior to establishing the variable AV. The licensee justified the deletion of SR 3.3.6.1.2 by stating in its letter dated November 17, 2014 (Reference 1), that:

The new AV, 175.6°F, is based on the worst case winter condition. The initial lead enclosure ambient temperature assumed in the analysis is 80°F, well below the typical winter or summer time operating temperature in the lead enclosure. Typical winter time operating temperature in the lead enclosure ranges from 100°F to 115°F. The lowest recorded temperature between 2009 and 2014 is 95°F for a period of approximately two days. Thus, the new AV is based on sufficiently low ambient temperature. Therefore, periodic surveillance is not required.

The NRC Staff finds that the licensee's explanation as stated above is acceptable because the licensee's proposed change is to use a fixed setpoint instead of the current variable setpoint. Therefore, periodic surveillance in SR 3.3.6.1.2 can be deleted.

3.3 Technical Evaluation - Radiation Protection and Consequence

The function of the MSLTLE high-temperature instrumentation is to detect a steam leak in the lead enclosure area. The main steam line tunnel lead enclosure has 12 temperature instruments. Each instrument actuates when its temperature setpoint is exceeded and is an input into the main steam line isolation valve logic circuitry. The MSIV circuitry closes the MSIVs.

The proposed changes would revise the allowable value setpoint for the MSLTLE Temperature-High isolation instrumentation (TS Table 3.3.6.1-1, Function 1.g) from ambient temperature

dependent to a constant value based on the worst case winter operating conditions. In addition, the associated leak rate would change from 25 gpm to 45 gpm equivalent condensate steam leak as the design basis for the MSLTLE.

In the license amendment request the licensee concluded that the increase in the steam leak rate has no impact on the radiological consequences associated with the main steam line break described in USAR, Section 15.6.4, steam system piping break outside of containment because the radiological consequences associated with the 45 gpm steam leak for one hour is bounded by the main steam line break described in USAR, Section 15.6.4.

NRC Staff's Assessment

There is no accident analysis or transient for NMP2 that credits the MSL tunnel lead enclosure high temperature instrumentation. MSL flow is the parameter used in the accident analysis to signal a MSL break outside containment. The proposed change does not affect calculated doses from the design basis accidents. Therefore, the design basis accident calculations were not reassessed.

For the proposed new leak rate of 45 gpm, the projected steam release during a one-hour time interval would be approximately 22,545 pounds mass. In comparison, the current licensing basis MSL break outside containment is based on a total projected mass release of about 105,840 pounds mass. The MSL break accident analysis, which assumes that the reactor coolant specific activity is at the maximum value allowable by TS limiting conditions of operation, estimates radiation doses at the exclusion area boundary, the low population zone, and control room that are a fraction of the limits established in 10 CFR Part 50.67. Therefore, the current licensing basis main steam line break accident analysis results would bound the proposed new leak rate of 45 gpm in the main steam line tunnel.

3.4 Conclusions Technical Evaluations

3.4.1 Containment

Based on the discussions in Section 3.1 of this Safety Evaluation (SE), the NRC staff determined that the proposed change meets the requirements of 10 CFR Part 50, Appendix A, (1) GDC 13, "Instrumentation and control," because adequate instrumentation are provided to monitor variables and systems, and controls are provided to maintain these variables and systems within prescribed operating ranges. Likewise, (2) GDC 20, "Protection system functions," is met because the protection system initiate automatically the operation of the appropriate systems, including the reactivity control systems, to assure that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences. Finally, (3) GDC 30, "Quality of reactor coolant pressure boundary," is met because means are be provided for detecting and, to the extent practical, identifying the location of the source of reactor coolant leakage. Therefore, the staff determined that the proposed license amendment is acceptable.

3.4.2 Instrumentation and Controls

Based on the discussion in Section 3.2 of this SE, the NRC staff concludes the proposed changes in the TSs provide reasonable assurance of adequate protection of public health, safety, and security based on the staff's evaluation in Section 3.0, which applies current and applicable regulatory evaluation criteria identified in Section 2.0. Therefore, the NRC staff determined the proposed TS changes for these items acceptable.

3.4.3 Radiation Protection and Consequence

Based on the discussion in Section 3.3 of this SE, the NRC staff has determined that the proposed revision to the MSL tunnel lead enclosure temperature setpoint is acceptable since it has no effect on the radiological consequences of design basis accidents.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the New York State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20, and changes surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (March 3, 2015, 80 FR 11476). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The NRC staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that 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.

7.0 REFERENCES:

1. Letter from James Barstow, Director - Licensing & Regulatory Affairs, Exelon Generation Company, LLC to U.S. Nuclear Regulatory Commission, Document Control Desk, "License Amendment Request - Primary Containment Isolation Instrumentation Technical Specification Allowable Value Change," November 17, 2014, ADAMS Accession No. ML14321A744.
2. Letter from James Barstow, Director - Licensing & Regulatory Affairs, Exelon Generation Company, LLC to U.S. Nuclear Regulatory Commission, Document Control Desk, "Response to Request for Additional Information - License Amendment Request - Primary Containment Isolation Instrumentation Technical Specification Allowable Value Change," March 20, 2015, ADAMS Accession No. ML15093A254.
3. Regulatory Guide (RG) 1.105, Revision 2, "Setpoints for Safety-Related Instrumentation," February 1986, ADAMS Accession No. ML003740318.
4. Regulatory Guide (RG) 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," July 2000, ADAMS Accession No. ML003716792.
5. NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition."
6. Letter from Richard V. Guzman, Senior Project Manager, NRC to Keith J. Polson, Vice President Nine Mile Point, "Nine Mile Point Nuclear Station, Unit No. 2 - Issuance of Amendment [125] Re: Implementation of Alternative Radiological Source Term," May 29, 2008, ADAMS Accession No. ML081230439.
7. Letter from James J. Raleigh, Project Manager, NRC to Harold W. Keiser, Senior Vice President - Nuclear, Pennsylvania Power and Light Company, "Isolation Setpoint for the Leak Detection Temperature Function in the Turbine Building Main Steam Tunnel, Susquehanna Steam Electric Station, Units 1 and 2 (TAC NOs. M80222 and M80223) [Amendment Nos. 119 and 87]" May 21, 1992, ADAMS Accession No. ML010090145.
8. Letter from Donna M. Skay, Project Manager, NRC to D. L. Farrar, Manager, Nuclear Regulatory Services, "Issuance of Amendments [No. 111 and 96]," LaSalle County Station, Unit Nos. 1 and 2, April 4, 1996, ADAMS Accession No. ML021130125.
9. Letter from Stephen P. Sands, Project Manager, NRC to William R. Kanda, Vice President - Nuclear, Perry, "Perry Nuclear Power Plant, Unit 1 - Issuance of Amendment, [Amendment No. 130]" July 9, 2004, ADAMS Accession No. ML041810686.

10. Letter from Alan B. Wang, Project Manager, NRC to Vice President, Operations, Entergy Operations, Inc., River Bend Station, "River Bend Station, Unit 1 - Issuance of Amendment Re: Technical Specification 3.3.6.1, "Primary Containment and Drywell Isolation Instrumentation," May 30, 1992, ADAMS Accession No. ML121070557.

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Date: May 26, 2015

May 26, 2015

Mr. Peter M. Orphanos
Site Vice President – Nine Mile Point Nuclear Station
Exelon Generation Company, LLC
348 Lake Road
Oswego, New York 13126

SUBJECT: NINE MILE POINT NUCLEAR STATION, UNIT 2 - ISSUANCE OF
AMENDMENT RE: PRIMARY CONTAINMENT ISOLATION
INSTRUMENTATION TECHNICAL SPECIFICATION ALLOWABLE VALUE
CHANGE (TAC NO. MF5193)

Dear Mr. Orphanos:

The Commission has issued the enclosed Amendment No. 147 to Renewed Facility Operating License No. NPF-69 for the Nine Mile Point Nuclear Station, Unit No. 2 (NMP2). The amendment consists of changes to the Technical Specifications (TSs) in response to your application transmitted by letter dated November 17, 2014, as supplemented by letter dated March 20, 2015.

The amendment revised the NMP2 TS Allowable Value for the Main Steam Line Tunnel Lead Enclosure Temperature-High instrumentation from an ambient temperature dependent (variable setpoint) to ambient temperature independent (constant Allowable Value). The changes deleted Surveillance Requirement (SR) 3.3.6.1.2 and revise the Allowable Value for Function 1.g on Table 3.3.6.1-1, "Primary Containment Isolation Instrumentation."

A copy of the related Safety Evaluation is enclosed. A Notice of Issuance will be included in the Commission's next regular biweekly *Federal Register* notice.

Sincerely,

/RA/

Brenda Mozafari, Senior Project Manager
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-410

Enclosures:

1. Amendment No. 147 to NPF-69
 2. Safety Evaluation
- cc w/encls: Distribution via Listserv

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ADAMS Accession No.: ML15110A008

*No substantial changes to SE transmitted by memo

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