



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

July 11, 2014

Mr. David A. Heacock  
President and Chief Nuclear Officer  
Dominion Nuclear Connecticut, Inc.  
Innsbrook Technical Center  
5000 Dominion Boulevard  
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION, UNIT NO. 3 - ISSUANCE OF AMENDMENT  
RE: PROPOSED CHANGES TO TECHNICAL SPECIFICATION 3/4.7.5,  
"ULTIMATE HEAT SINK" (TAC NO. MF1780)

Dear Mr. Heacock:

The Commission has issued the enclosed Amendment No. 260 to the Renewed Facility Operating License for the Millstone Power Station, Unit No. 3, License No. NPF-49. This amendment is in response to your application dated May 3, 2013, as supplemented by letters dated July 2 and October 2, 2013, and January 15 and May 28, 2014.

The amendment revises the Technical Specification (TS) Limiting Condition for Operation (LCO) 3.7.5, "Ultimate Heat Sink (UHS)," by raising the maximum temperature limit of the UHS from 75°F to 80°F, and revising the associated TS action statements to state, "With ultimate heat sink temperature greater than 80°F, be in HOT STANDBY within 6 hours and COLD SHUTDOWN within the following 30 hours."

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

Sincerely,

A handwritten signature in black ink that reads "Mohan C. Thadani".

Mohan C. Thadani, Senior Project Manager  
Plant Licensing Branch I-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-423

Enclosures:

1. Amendment No. 260 to NPF-49
2. Safety Evaluation

cc w/encls: Distribution via Listserv



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

DOMINION NUCLEAR CONNECTICUT, INC.

DOCKET NO. 50-423

MILLSTONE POWER STATION, UNIT NO. 3

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 260  
Renewed License No. NPF-49

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by the applicant, dated May 3, 2013, as supplemented by letters dated July 2 and October 2, 2013, and January 15 and May 28, 2014, 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.

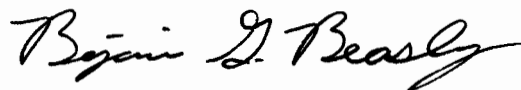
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-49 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 260, and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated in the renewed license. DNC 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 issuance, and shall be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Benjamin G. Beasley, 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: July 11, 2014

ATTACHMENT TO LICENSE AMENDMENT NO. 260  
RENEWED FACILITY OPERATING LICENSE NO. NPF-49

DOCKET NO. 50-423

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  
4

Insert  
4

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

Remove  
3/4 7-13

Insert  
3/4 7-13

(2) Technical Specifications

The Technical Specifications contained in Appendix A, revised through Amendment No. 260 and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto are hereby incorporated into the license. DNC shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

- (3) DNC shall not take any action that would cause Dominion Resources, Inc. (DRI) or its parent companies to void, cancel, or diminish DNC's commitment to have sufficient funds available to fund an extended plant shutdown as represented in the application for approval of the transfer of the licenses for MPS Unit No. 3.
- (4) Immediately after the transfer of interests in MPS Unit No. 3 to DNC, the amount in the decommissioning trust fund for MPS Unit No. 3 must, with respect to the interest in MPS Unit No. 3, that DNC would then hold, be at a level no less than the formula amount under 10 CFR 50.75.
- (5) The decommissioning trust agreement for MPS Unit No. 3 at the time the transfer of the unit to DNC is effected and thereafter is subject to the following:
- (a) The decommissioning trust agreement must be in a form acceptable to the NRC.
  - (b) With respect to the decommissioning trust fund, investments in the securities or other obligations of Dominion Resources, Inc. or its affiliates or subsidiaries, successors, or assigns are prohibited. Except for investments tied to market indexes or other non-nuclear-sector mutual funds, investments in any entity owning one or more nuclear power plants are prohibited.
  - (c) The decommissioning trust agreement for MPS Unit No. 3 must provide that no disbursements or payments from the trust, other than for ordinary administrative expenses, shall be made by the trustee until the trustee has first given the Director of the Office of Nuclear Reactor Regulation 30-days prior written notice of payment. The decommissioning trust agreement shall further contain a provision that no disbursements or payments from the trust shall be made if the trustee receives prior written notice of objection from the NRC.
  - (d) The decommissioning trust agreement must provide that the agreement can not be amended in any material respect without 30 days prior written notification to the Director of the Office of Nuclear Reactor Regulation.

## PLANT SYSTEMS

### 3/4.7.5 ULTIMATE HEAT SINK

#### LIMITING CONDITION FOR OPERATION

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3.7.5 The ultimate heat sink (UHS) shall be OPERABLE with a water temperature of less than or equal to 80°F.

APPLICABILITY: MODES 1, 2, 3, and 4.

#### ACTION:

With the UHS water temperature greater than 80°F, be in HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.

#### SURVEILLANCE REQUIREMENTS

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4.7.5 The UHS shall be determined OPERABLE:

- a. At the frequency specified in the Surveillance Frequency Control Program by verifying the water temperature to be within limits.
- b. At least once per 6 hours by verifying the water temperature to be within limits when the water temperature exceeds 75°F.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 260

TO RENEWED FACILITY OPERATING LICENSE NO. NPF-49

DOMINION NUCLEAR CONNECTICUT, INC.

DOCKET NO. 50-423

MILLSTONE POWER STATION, UNIT NO. 3

1.0 INTRODUCTION

By letter dated May 3, 2013, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13133A032), as supplemented by letters dated July 2 and October 2, 2013 (ADAMS Accession Nos. ML13198A278 and ML13281A804, respectively), and January 15 and May 28, 2014 (ADAMS Accession Nos. ML14023A646 and ML14154A091, respectively), Dominion Nuclear Connecticut, Inc., the licensee for Millstone Power Station, Unit 3 (MPS3) requested an amendment to Operating License NPF-49 for MPS3. The supplemental letters dated July 2, 2013, October 2, 2013, January 15, 2014, and May 28, 2014, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on August 20, 2013 (78 FR 51225). The proposed amendment revises the Technical Specification (TS) Limiting Condition for Operation (LCO) 3.7.5, "Ultimate Heat Sink (UHS)."

The amendment would revise the TS LCO 3.7.5, "Ultimate Heat Sink (UHS)," by raising the maximum temperature limit of the UHS from 75°F to 80°F, and revise the associated TS action statements to state that, "With ultimate heat sink temperature greater than 80°F, be in HOT STANDBY within 6 hours and COLD SHUTDOWN within the following 30 hours."

2.0 REGULATORY EVALUATION

The licensee's amendment request is evaluated for a change to the UHS temperature and the impact of the change in UHS temperature on the containment analysis.

2.1 Ultimate Heat Sink

The U.S. Nuclear Regulatory Commission (NRC) guidance, requirements, and review criteria that the NRC staff considered to be applicable to the review of proposed revisions to the ultimate heat sink are listed below.

Standard Review Plan (SRP), Chapter 9.2.5, "Ultimate Heat Sink," provides regulatory guidance for acceptable adherence to NRC regulations.

The design of the UHS must satisfy the requirements of General Design Criteria (GDC) 2, 5, 44, 45, and 46. Specifically this license amendment request (LAR) requires the licensee's adherence to Criterion 44 as discussed below.

Regulatory Guide (RG) 1.27, "Ultimate Heat Sink for Nuclear Power Plants," provides the NRC staff with an acceptable basis that may be used to implement Criterion 44, "Cooling water." Specifically, the UHS serving multiple units should be capable of providing sufficient cooling water to permit simultaneous safe shutdown and cool down of all units it serves and to maintain them in a safe shutdown condition. Also, in the event of an accident in one unit, the UHS should be able to dissipate the heat for that accident safely, to permit the concurrent safe shutdown and cool down of the remaining units, and to maintain all units in a safe shutdown condition.

Criterion 44, "Cooling water," states, in part, that "A system to transfer heat from Structures, Systems, and Components (SSC) important to safety, to an UHS shall be provided. The system safety function shall be to transfer the combined heat load of these SSC under normal operating and accident conditions."

## 2.2 Containment Analysis

The regulatory requirements and the guidance for containment analyses impacted by the proposed UHS change are based on the following requirements:

Criterion-16 relates to the containment and associated systems establishing a leak-tight barrier against the uncontrolled release of radioactivity to the environment and assuring that the containment design conditions important to safety are not exceeded for as long as the postulated accident conditions require.

Criterion-38, relates to the containment heat removal system safety function. The system safety function shall be to reduce rapidly, consistent with the functioning of other associated systems, the containment pressure and temperature following any loss-of-coolant accident (LOCA) and to maintain them at acceptably low levels.

Criterion-50 relates to the containment design basis. It states, in part, that the system shall be designed so that the containment structure and its internal compartments can accommodate, without exceeding the design leakage rate and with sufficient margin, the calculated pressure and temperature conditions resulting from any LOCA.

## 3.0 TECHNICAL EVALUATION

### 3.1 System Description

The UHS for MPS3 is Long Island Sound which supports heat removal from both safety related and non-safety related cooling systems during normal operation, shutdown, and accident conditions via the Service Water (SW) and Circulating Water (CW) systems. The SW system consists of two redundant flow loops, each consisting of two SW pumps, two SW self-cleaning strainers, two booster pumps, piping, and valves. The SW pumps and strainers are located in the CW and SW pump-house. The SW system discharges into the CW discharge tunnel.



The MPS3 SW System loop cools the Safety-Related (SR) Heat Exchangers (HXs) listed below:

- Charging Pump Cooler (3CCE\*E1A/B)
- SI Pump Cooler (3CCI\*E1A/B)
- Control Building A/C Water Chiller Condenser (3HVK\*CHL1A/B)
- Residual Heat Removal Pump (RHRP) Ventilation Unit (3HVQ\*ACUS1A/B)
- Containment Recirculation Pump Ventilation Unit (3HVQ\*ACUS2A/B)
- MCC & Rod Control Area A/C Unit (3HVR\*ACU1A/B)
- Emergency Diesel Generator Engine Air Cooler (3EGS\*E1A/B) and Jacket Cooler (3EGS\*E2A/B)
- Containment Recirculation Coolers (3RSS\*E1A/B/C/D)
- Reactor Plant Closed Cooling Water HX (3CCP\*E1A/B/C)

The capabilities of these HXs to perform their heat removal functions were reanalyzed at UHS temperature of 80°F.

### 3.2 Licensee's Proposed TS Changes

#### 3.2.1 Current TS 3/4.7.5 reads as follows

3.7.5 The Ultimate Heat Sink shall be OPERABLE with an average water temperature of less than or equal to 75°F.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

If the UHS temperature is above 75°F, monitor the UHS temperature once per hour for 12 hours. If the UHS temperature does not drop below 75°F during this period, place the plant in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. During this period, if the UHS temperature increases above 77°F, place the plant in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

#### SURVEILLANCE REQUIREMENTS

TS 4.7.5 The Ultimate Heat Sink shall be determined OPERABLE:

- a. At the frequency specified in the Surveillance Frequency Control Program by verifying the average water temperature to be within limits.
- b. At least once per 6 hours by verifying the average water temperature to be within limits when the average water temperature exceeds 70°F.

### 3.2.2 Proposed TS changes:

The amendment would revise the LCO and SR by removing the word "average" from the LCO and SR, and change the OPERABLE temperature limit from 75°F to 80°F. The LAR would also change the current action statement to shutting down and cooling down the plant if UHS temperature exceeds 80°F. The proposed amended TS is as follows:

TS 3.7.5 The ultimate heat sink (UHS) shall be OPERABLE with a water temperature of less than or equal to 80°F.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

With the UHS water temperature greater than 80°F, be in HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS (SR)

SR 4.7.5 The UHS shall be determined OPERABLE:

- a. At the frequency specified in the Surveillance Frequency Control Program by verifying the water temperature to be within limits.
- b. At least once per 6 hours by verifying the water temperature to be within limits when the water temperature exceeds 75°F.

### 3.3 Evaluation of UHS Changes

The NRC staff performed a review of the MPS3 LAR and the licensee's design inputs, assumptions and methodology, where appropriate, for adherence to regulatory requirements and guidelines. In order to allow a 5°F rise in UHS/SW temperature and still maintain operability, the equipment important to safety that is supported by SW must remain operable by receiving adequate SW flow at 80°F. The associated piping, pipe supports and equipment nozzles must remain within design allowable stresses with the 5°F rise in temperature and the effect on various engineering programs must be satisfactorily evaluated for the increase in SW temperature.

#### Service Water System Flow Analysis:

The licensee calculated the minimum SW flow required to remove the heat from the safety related HXs for a Design Basis Event (DBE) and the minimum SW flow available from a flow model for each HX. In Table 5.2 of the May 3, 2013 LAR, the licensee listed the minimum required SW flow rate at 80°F for each safety related HX cooled by SW. Table 5.2 also lists the calculated minimum available SW flow for each HX. The calculated flow is determined from flow modeling of the SW system. In attachment 1 to the licensee's supplement dated July 2, 2013, the licensee stated that it uses the software program, Proto-Flo, to model its SW system for calculating the minimum available SW flow for each component cooled by the SW system.

The intent is to ensure that the minimum calculated model flow is greater than the minimum required flow for performing the safety related function. In a Request for Additional Information (RAI) dated December 13, 2013, the NRC staff asked the licensee to describe the accuracy of the minimum calculated flow rates provided in Table 5.2 as compared to flow rates measured in the field. The licensee responded in a letter dated January 15, 2014 (ADAMS Accession No. ML14023A646), that the accuracy of the model was verified with measured flow data and the model was adjusted accordingly to closely match measured data. The licensee stated that the measured flow exceeds the calculated flow in each test case, and the calculated flows are lower than the actual delivered flows and thus are conservative for determining that the required heat is being transferred in each safety related HX.

#### Net Positive Suction Head:

The increase in SW temperature affects the net positive suction head (NPSH) available to the SW pumps, Motor Control Center (MCC) and Rod Control Area Booster pumps and the Control Building Heating Ventilation and Air Conditioning Booster pumps. The licensee stated that its calculations show that the NPSH available exceeds the NPSH required at 80°F, thus the effect on NPSH is not a concern.

Raising the operability limit of the UHS from 75°F to 80°F will be satisfactory if all associated safety related components cooled by the UHS can perform their safety functions with the UHS at 80°F. Each safety related load cooled by SW is evaluated as follows:

#### Emergency Diesel Generators:

The SW system provides cooling water for the jacket water cooler and air cooler for each Emergency Diesel Generator (EDG). The vendor data sheet provided in the licensee's July 2, 2013, supplement (ADAMS Accession No. ML13198A272), lists the design flow rate of SW for each EDG to be 1900 gallons per minute (gpm). The licensee's calculation determined that a minimum of 1444 gpm of SW at 80°F would be the required flow to remove the design heat load. The licensee explained this difference in its letter dated January 15, 2014. It stated that the previous analysis of record used an overly conservative fouling factor. When a more appropriate fouling factor was used, the required flow at 80°F calculated to be a minimum of 1444 gpm. The licensee's flow analysis determined that the available flow is 1713 gpm which exceeds minimum required flow rate. Therefore, the SW system provides satisfactory flow at 80°F or below to the EDGs.

#### Charging Pump Coolers:

The licensee calculated that a minimum of 31 gpm of SW at 80°F is needed to remove the design heat rate from each charging pump. The licensee's flow analysis determined that the available flow is 40.8 gpm, which exceeds minimum required flow rate. Therefore, the SW system provides satisfactory flow at 80°F or below to the charging pump coolers.

#### Safety Injection Pump Coolers:

The licensee calculated that a minimum of 14 gpm of SW at 80°F is needed to remove the safety injection pump design heat rate. The previous minimum required flow rate of 19 gpm at

75°F was based on a downstream piping analysis temperature limitation. Reanalysis of the piping system at an increased outlet temperature eliminated the restriction making 14.7 gpm the minimum needed flow at 80°F. The licensee's flow analysis determined that the available flow is 22.7 gpm which exceeds minimum required flow rate. Therefore, the SW system provides satisfactory flow at 80°F or below to the safety injection pump coolers.

Control Building Air Conditioning Water Chillers:

The licensee determined that a minimum of 303 gpm of SW at 80°F is needed to remove the design heat rate of the Control Building Air Conditioning Water Chillers. This flow rate of SW is identical to the required flow previously determined at 75°F. The NRC staff asked the licensee in RAI dated December 19, 2013 (ADAMS Accession No. ML13347B093), to explain why the required flow rate is identical for 75°F and for 80°F. In their response dated January 15, 2014, the licensee stated that with the added increase in SW temperature to 80°F, the condensing pressure of the R-12 refrigerant will increase, but the increase will be less than the maximum allowable condensing pressure, which will still allow the chiller unit to perform as required. The licensee's flow analysis determined that the available flow of SW is 315 gpm, which exceeds minimum required flow rate. Therefore, the SW system provides satisfactory flow at 80°F or below to the Control Building Air Conditioning Water Chillers.

Motor Control Center and Rod Control Area Ventilation Units:

The licensee determined that the minimum required SW flow would have to increase from 75 gpm to 122 gpm to accommodate an 80°F UHS temperature. The licensee's flow analysis determined that the available flow is 129 gpm which exceeds the minimum required flow rate. Therefore, the SW system provides satisfactory flow at 80°F or below to the MCC & Rod Control Area Ventilation Units.

Recirculation Spray System (RSS) Heat Exchangers:

The licensee stated that the RSS HX thermal performance analyses of record for containment heat removal were previously performed at an 80°F UHS temperature. The effects of a UHS temperature of 80°F were evaluated on containment heat removal and the corresponding effects on recirculation spray piping, Environmental Qualification, sump temperature and NPSH for the pumps that draw from the containment sump. The NRC staff evaluated the licensee's LOCA containment analyses that showed that the changes implemented pursuant to NRC regulations at 10 CFR 50.59 requirements, using the revised UHS temperature of 80°F corrected mass and energy releases met the requirements of GDC 16, 38, and 50. Therefore, the NRC staff finds the proposed TS changes are acceptable.

Reactor Plant Component Cooling Water System Heat Exchangers:

The Reactor Plant Component Cooling Water System (RPCCW system) provides cooling to the following safety related loads; Containment Air Recirculation (CAR) cooling coils, the seal water HXs, letdown HX, fuel pool coolers, Residual Heat Removal Pump seal coolers and Residual Heat Removal Pump HXs. The RPCCW system also provides cooling to the reactor coolant pumps. The licensee has performed heat load analysis of RPCCW system performance for loss of offsite power, safety injection, normal plant shutdown, fire shutdown scenarios, and Safety

Grade Cold Shutdown (SGCS) and determined the minimum required SW flow rate at 80°F for each plant condition. Table 5.2 of the May 3, 2013, submittal (ADAMS Accession No. ML13133A032), shows that the calculated minimum SW flow exceeds the minimum required flow for each scenario. Therefore, the SW system provides satisfactory heat removal flow at 80°F or below to the Reactor Plant Component Cooling Water System Heat Exchangers.

The increase in UHS/SW to 80°F results in higher RPCCW system supply temperature for both normal cool down and SGCS. However, the increased RPCCW system temperature will not result in exceeding any design acceptance criteria for affected piping, supports or equipment nozzles. NRC Generic Letter (GL) 96-06, "Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions," addressed issues of water hammer in containment coolers brought about by voiding and heat up occurring because of load sequencing and rapid rise in containment temperature following a design basis accident (DBA). The CAR coolers have automatic switchover from chilled water to RPCCW system to limit the timeframe for potential for a water hammer event. Analyses have been performed which have concluded that the static pressure in the RPCCW system piping will exceed the maximum saturation pressure throughout, thus there is no potential for void formation and the CAR coils and RPCCW system piping within containment will maintain their structural integrity and continue to satisfy the requirements and commitments to GL 96-06 at a UHS temperature of 80°F. Therefore, the SW system provides satisfactory flow at 80°F or below to the RPCCW HXs.

#### Residual Heat Removal Pump Ventilation and Containment Recirculation Pump Cubicle Ventilation Units:

The licensee performed calculations to determine the minimum required SW flow needed to remove the maximum calculated heat loadings of the Residual Heat Removal Pump Ventilation and Containment Recirculation Pump Cubicle Ventilation Units with a SW temperature of 80°F. A minimum of 25 gpm and 33 gpm, respectively, were determined necessary to support the required HX performance at 80°F. The flow rates were also the current minimum required flow rates at 75°F which were based on downstream piping analysis temperature limitations. The licensee reevaluated the piping analysis temperature limitations for 80°F and determined that the required SW flow is unchanged from 75°F analysis of record. However, the NRC staff noted that the minimum SW flow was not proportional to the vendor designated SW flow as listed on the vendor data sheet provided by the licensee in its letter dated July 2, 2013 (ADAMS Accession No. ML13198A278). In an RAI dated December 19, 2013 (ADAMS Accession No. ML13347B093) and an e-mail RAI dated May 19, 2014, (ADAMS Accession No. ML14139A100) the NRC staff asked the licensee to explain the seeming inconsistency of SW flow rates, to provide definitive statements as to the performance of safety functions of the Engineered Safety Features (ESF) air conditioning units at the low SW flow rates, and to describe any adverse effects on the R-22 condensing function. The licensee responded in a letter dated May 28, 2014 (ADAMS Accession No. ML14154A091) by stating that the increase in R-22 temperature and corresponding saturated pressure due to the reduced SW flow rates is within the normal operating range limit of 269.7 psia for the R-22 compressors. Thus, the chillers are fully capable of removing the required heat load at 80°F SW temperature assuming worst case calculated SW flow rates. The NRC staff considered the licensee's response to be reasonable and considers the SW flow rate as provided by the licensee to be acceptable.

Piping and Pipe Support Analysis:

Piping and pipe supports have been analyzed by the licensee for the increase in SW temperature. The additional 5°F has no adverse impact on the piping and pipe support and equipment nozzle analyses. The licensee evaluated the existing analyses of record for water hammer loadings for SW piping. The 5°F increase in UHS temperature was determined to have an insignificant effect on the water hammer analysis.

Generic Letter 89-13 Thermal Performance Test and Program:

The licensee evaluated the effect of raising the SW temperature to 80°F on the GL 89-13 ("Service Water System Problems Affecting Safety-Related Equipment") Program. The licensee has revised the allowable micro fouling limits on the MCC and Rod Control Area Air conditioning HXs and has identified new HX allowable pressure differentials based on new higher minimum allowable SW flow rates necessitated by the rise in SW temperature. Changes in the GL 89-13 implementation will require cleaning of the MCC and Rod Control Area HXs within 4 months of the UHS excursions above 75° F and revised HX Surveillance Monitoring Curves for macro fouling.

Other Programs:

The licensee evaluated the effect of raising the maximum allowed UHS/SW temperature to 80°F on other plant engineering programs and determined that the additional 5°F does not affect the conclusions of the analyses associated with these programs. The programs include the Motor Operated Valve Program, the Air Operated Valve Program, In Service Test Program and the Electrical Equipment Environmental Qualification Program. Instrumentation ranges that support compliance with RG 1.97 still meet their acceptance criteria with the UHS at 80°F.

The licensee used to use the average of the six CW inlet water box wall temperature indicators for adherence to SR 4.7.5. These instruments do not have documented uncertainty and could be off by 1°F. The licensee installed remote indicating precision instrumentation at each train's SW inlet to the RPCCW system which will be used for compliance to SR 4.7.5 and does not need to be averaged.

The NRC staff has reviewed the licensee's application, in its supplements and responses to requests for additional information, and concludes that raising the temperature limit of LCO 3/4.7.5 to 80°F while remaining in Modes 1, 2, 3 or 4 is acceptable. Based on the reviews, the NRC staff concludes that there is reasonable assurance that the requirements of 10 CFR Part 50 Appendix A Criterion 44 and the UFSAR and the guidelines of SRP 9.2.5 and RG 1.27 will continue to be met.

3.4 Evaluation of Containment Analysis

MPS3 uses a Westinghouse 4-Loop, closed cycle, Pressurized-Water Reactor (PWR) type nuclear steam supply system with sub-atmospheric reactor containment. The Long Island Sound is its UHS which removes heat from the safety related cooling systems during accident conditions using the safety related SW system.

### Loss-of-Coolant Accident Containment Analysis

As described in the MPS3 Updated Final Safety Analysis Report (UFSAR), the current LOCA containment analysis, was performed as a part of the Stretch Power Uprate (SPU) application with a UHS temperature of 80°F which was approved by the NRC on August 12, 2008 (ADAMS Accession No. ML081610585). Though the analysis was performed with a UHS temperature of 80°F, the licensee did not request the incorporation of the higher UHS temperature into the TS with the SPU application.

The licensee further revised the LOCA containment analysis using the revised Westinghouse Mass and Energy (M&E) release rate data after correcting errors identified in Westinghouse Nuclear Safety Advisory Letter (NSAL)-11-5, "Westinghouse LOCA Mass and Energy Release Calculation Issues," dated July 25, 2011, and correcting another error specific to the MPS3. The revised analyses continue to assume a SW temperature of at least 80°F.

In a letter dated May 3, 2013 (ADAMS Accession No. ML13133A032), the licensee stated that the reconciliation of other aspects of the containment analysis has been implemented under 10 CFR 50.59. In response to SCVB-RAI-1 dated October 2, 2013, (ADAMS Accession No. ML13281A804), the licensee listed the analyses given below that were performed under 10 CFR 50.59 using: (a) methodology approved by NRC in DNC Topical Report DOM-NAF-3 (ADAMS Accession No. ML062420511), (b) UHS temperature of 80°F, and (c) the corrected M&E release data. The licensee concluded that:

- (1) For small and large-break LOCA containment pressure and temperature response, containment liner temperature response, and temperatures of selected nodes of the Quench Spray System (QSS) and Recirculation Spray System (RSS) piping and supports for structural analysis, the results were confirmed acceptable.
- (2) For large-break LOCA containment pressure and temperature response for Equipment Environmental Qualification (EEQ) evaluation, the results of the evaluation demonstrated that EEQ limits were satisfied.
- (3) For containment sump fluid temperature response during a LOCA the licensee confirmed that the (a) peak sump fluid temperature is bounded by the assumptions used in the RSS piping stress analysis; (b) sump fluid does not flash in the recirculation piping, (c) sufficient Net Positive Suction Head (NPSH) is available so that cavitation does not occur at the RSS and Emergency Core Cooling System (ECCS) pump impellers.

For the LOCA containment pressure analysis using the corrected M&E data, the licensee used the methodology approved by NRC in a letter dated August 30, 2006 (ADAMS Accession No. ML062420511) and calculated the peak pressure  $P_a$ . The licensee stated that the revised containment analysis resulted in an increase in the peak containment pressure  $P_a$ . In a separate LAR dated April 25, 2013, (ADAMS Accession No. ML13120A158) the licensee requested and the NRC approved the TS change to increase the value of  $P_a$ .

The NRC staff requested in an RAI that the licensee confirm that the changes implemented under the 10 CFR 50.59 meet the requirements of 10 CFR 50 Appendix A, General Design Criterion (GDC) 16, 38, and 50. In response to SCVB-RAI-2 dated October 2, 2013, (ADAMS Accession No. ML13281A804), the licensee stated that the LOCA containment analyses performed under 10 CFR 50.59 change using corrected errors in the M&E release data implemented under the provisions of 10 CFR 50.59, meet the requirements of GDC 16, 38, and 50 of 10 CFR 50 Appendix A.

Based on its evaluation the NRC staff concludes that the licensee's LOCA containment analyses, changes implemented under 10 CFR 50.59 using the revised UHS temperature of 80°F, and the corrected M&E release data are acceptable, and the licensee continues to meet the requirements of Criterion 16, 38, and 50.

### 3.5 Conclusions

The NRC staff concludes that the licensee's proposed changes continue to meet the NRC's requirements of 10 CFR Part 50 Appendix A, Criterion 16, 38, 44, and 50, of the UFSAR, as well as the guidelines of SRP 9.2.5 and RG 1.2.7. Therefore, the NRC staff concludes that the licensee's proposed changes to the TS are acceptable.

### 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Connecticut 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 to 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 (78 FR 51225). 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 Commission 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.

Principal Contributors: G. Purciarello  
A. Sallman

Date: July 11, 2014

July 11, 2014

Mr. David A. Heacock  
President and Chief Nuclear Officer  
Dominion Nuclear Connecticut, Inc.  
Innsbrook Technical Center  
5000 Dominion Boulevard  
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION, UNIT NO. 3 - ISSUANCE OF AMENDMENT  
RE: PROPOSED CHANGES TO TECHNICAL SPECIFICATION 3/4.7.5,  
"ULTIMATE HEAT SINK." (TAC NO. MF1780)

Dear Mr. Heacock:

The Commission has issued the enclosed Amendment No. 260 to the Renewed Facility Operating License for the Millstone Power Station, Unit No. 3, License No. NPF-49. This amendment is in response to your application dated May 3, 2013, as supplemented by letters dated July 2 and October 2, 2013, and January 15 and May 28, 2014.

The amendment revises the Technical Specification (TS) Limiting Condition for Operation (LCO) 3.7.5, "Ultimate Heat Sink (UHS)," by raising the maximum temperature limit of the UHS from 75°F to 80°F, and revising the associated TS action statements to state, "With ultimate heat sink temperature greater than 80°F, be in HOT STANDBY within 6 hours and COLD SHUTDOWN within the following 30 hours."

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

Sincerely,

/RA/

Mohan C. Thadani, Senior Project Manager  
Plant Licensing Branch I-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-423

Enclosures:

1. Amendment No. 260 to NPF-49
2. Safety Evaluation

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**ACCESSION NUMBER: ML14178A599**

OFFICE	NRR/LPL1-1/PM	NRR/LPL1-1/LA	DSS/STSB/BC	DSS/SBPB/BC	DSS/SCVB/BC	OGC	NRR/LPLI-1/BC
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DATE	7/11/14	07/07/14	7/8/14	06/11/14	01/29/14	7/8/14	7/10/14

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