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10 CFR 50.55a

NMP1L3454

March 2, 2022

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555-0001

Nine Mile Point Nuclear Station, Unit 1  
Renewed Facility Operating License No. DPR-63  
NRC Docket No. 50-220

Subject: Relief Request Associated with Pump Periodic Verification Tests of Core Spray System Pumps

In accordance with 10 CFR 50.55a, "Codes and standards," Constellation Energy Generation, LLC (CEG) requests approval of relief request CS-PR-02, Revision 0 associated with the Inservice Testing (IST) Program for Nine Mile Point Nuclear Station, Unit 1 (NMP1). This relief request concerns pump periodic verification tests of Core Spray System Pumps. The IST Program for the fifth ten-year interval at NMP1 complies with the 2012 Edition of the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) with no Addenda.

We request your approval by February 1, 2023.

There are no regulatory commitments contained in this letter.

If you have any questions, please contact Tom Loomis at 610-765-5510.

Respectfully,

*David T. Gudger*

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David T. Gudger  
Sr. Manager - Licensing  
Constellation Energy Generation, LLC

Attachment: Request for Relief CS-PR-02

cc: Regional Administrator - NRC Region I  
NRC Senior Resident Inspector - Nine Mile Point  
NRC Project Manager - Nine Mile Point  
A. L. Peterson - NYSERDA

**Attachment**  
**Request for Relief CS-PR-02**

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**Relief Request CS-PR-02 Associated with Pump Periodic Verification Tests of Core Spray System  
Pumps In Accordance with 10 CFR 50.55a(z)(1)  
-- Alternative Provides Acceptable Level of Quality and Safety --**

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**1. American Society of Mechanical Engineers (ASME) Code Component(s) Affected**

The following Core Spray System Pumps are affected:

Component	Description	Class	Group
PMP-81-04	Core Spray System Pump #122	2	B
PMP-81-24	Core Spray System Pump #112	2	B
PMP-81-49	Core Spray System Topping Pump #112	2	B
PMP-81-52	Core Spray System Topping Pump #122	2	B

**2. Applicable Code Edition and Addenda**

ASME Code for Operation and Maintenance of Nuclear Power Plants (OM Code) 2012 Edition with no Addenda.

**3. Applicable Code Requirement**

Division 1, Mandatory Appendix V, Pump Periodic Verification Test (PPVT) Program, paragraph V-3000, General Requirements, subparagraph (b) requires the Owner to perform a PPVT at least once every two years.

**4. Reason for Request**

Pursuant to 10 CFR 50.55a, *Codes and standards*, paragraph (z)(1), an alternative is proposed to the pump testing requirements of the ASME OM-2012 Code, Mandatory Appendix V. With the adoption of the ASME OM-2012 Code on January 1, 2019 for Nine Mile Point Nuclear Station, Unit 1 (NMP1), a new requirement was added to the IST Program to perform periodic verification testing every two (2) years at the pump's highest design basis accident flow rate. The two sets of pumps (see affected components list above) have the capability to pump demineralized water from the Condensate Storage Tanks (CSTs) into the Reactor Pressure Vessel (RPV) at the design basis accident flow rate. NMP1 proposes to perform the PPVT of these two pump sets at an extended frequency of 24-months staggered (each train tested every 48 months) instead of the OM Code required every 24 months (2 years). The basis of this request is the pumps' good performance. Pump testing over the last 12 years has shown no signs of mechanical or hydraulic degradation as indicated by consistent performance of the Core Spray System (CSS) pumps within ASME OM Code acceptance criteria and only needing minor routine maintenance. Additionally, this request aids NMP1 in the implementation of a division-based outage strategy that will allow testing of a single division per outage.

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### System Safety Function

The CSS pumps take suction from the Torus (Suppression Pool) and spray water into the reactor vessel on top of the fuel assemblies to cool the core in the event of a Loss of Coolant Accident (LOCA). The CSS consists of two independent "systems" (loops). A diagram is provided in the NMP1 Updated Final Safety Analysis Report (UFSAR), Figure VII-1. Each loop contains redundant pump sets with each set of pumps comprised of a CSS pump and CSS topping pump.

The CSS, in conjunction with the Automatic Depressurization System (ADS), is the standby emergency core cooling system for removal of decay heat from the reactor fuel assemblies in the event of a LOCA. For a large break LOCA, the CSS provides the required core cooling without assistance.

For a small break LOCA, the RPV is depressurized by the ADS to allow the low-pressure CSS to operate. For a CSS loop to achieve its design basis flow rate, one CSS pump set (consisting of a single CSS pump and its associated CSS topping pump) must start and one inside isolation valve must open within the specified time requirements. The CSS contains redundant pumps and injection valves so that no single failure of an active component would cause a loop to become inoperable.

### System Testing

A permanent test return line is provided to permit surveillance testing of the CSS pumps without injecting Torus water into the RPV. The test return line connects to the CSS piping between the CSS topping pump and the outboard reactor coolant isolation valve and discharges into the Torus.

The highest required design basis accident flow rate for the CSS system is 4540 gpm for each CSS pump set (4635 gpm when adjusted for test instrumentation). The CSS test return lines for the CSS pumps are used to conduct routine system testing at a flowrate of approximately 2900 gpm per CSS pump set. This is 64% of the highest design basis accident flow rate. This design allows for routine quarterly testing at a representative point on the pump's performance curve to allow for demonstrating pump performance, but not at the highest design basis accident flow rate.

Currently, to meet PPVT requirements, one CSS pump set in each loop is aligned to take suction from the CSTs and inject to the RPV. This permits core spray injection tests into the RPV during outages using clean demineralized water from the CSTs rather than torus water. The CSS pump sets with this capability are the CSS pump sets #112 and #122.

## 5. Proposed Alternative and Basis for Use

NMP1 proposes to perform the PPVT at an alternate frequency (48 months) with these pump sets while retaining the normal quarterly testing.

The CSS pump sets have been and will continue to be tested quarterly in accordance with the ASME OM Code paragraph ISTB- 5200, Vertical Line Shaft Centrifugal Pumps for the CSS pumps, and paragraph ISTB- 5100, Centrifugal Pumps (Except Vertical Line Shaft Centrifugal Pumps), for the CSS topping pumps. This CSS pump operability and performance testing is currently being performed in accordance with the NMP1 Technical Specifications Surveillance Requirement 4.1.4 and the Inservice Testing Program.

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Each CSS loop was designed for full flow rated conditions. Data on flows and pressures at various points in the flow lines for each CSS pump was obtained during testing and was used to create the field validated pump performance curves. These tests showed that each CSS pump set was able to meet the design basis accident flow conditions.

Data on the pump set flow rates and pressures for each CSS loop are routinely obtained for comparison with the previously established normal conditions in accordance with the IST program. Testing and baselining of the pump performance test acceptance criteria is reperformed following major maintenance of the CSS pumps in accordance with ISTB-3300, Reference Values. Testing of the CSS pumps at a flow rate of approximately 2900 gpm utilizing the existing test return line flow path provides for substantial flow testing in a stable region of the pump curve. Testing over the last 12 years has shown no signs of mechanical or hydraulic degradation as indicated by consistent performance of the CSS pumps within ASME OM Code acceptance criteria.

A review of the completed maintenance and the Inservice Testing results discussed above for the CSS pumps and topping pumps concluded the pumps have only required minor maintenance and the pumps have retained their operational readiness with no signs of mechanical or hydraulic degradation. Pump performance monitoring conducted for the CSS pumps includes pump-motor bearing housing temperatures, vibration monitoring, and periodic sampling of the lube oil. Performance monitoring of the CSS pumps indicates they remain capable of meeting their design function and have no indication of degradation. If measured parameters are found to be outside the normal operating range or determined to be trending toward an unacceptable degraded state, then appropriate actions are taken. These actions include monitoring additional parameters, review of specific information to identify cause, and potential removal of the pump from service to perform necessary maintenance. Continued testing in a stable flow range combined with the additional pump performance monitoring provides reliable performance monitoring beyond the requirements prescribed in the Code that validates the ability of each pump to meet the design basis accident flow rates. The testing is effective for detecting mechanical and hydraulic degradation as required by Subsection ISTB.

Therefore, the proposed alternative to perform PPVT testing of the NMP1 CSS pump sets #112 and #122 at a 24-month staggered (four year) frequency will continue to provide assurance of the CSS pumps' operational readiness and provides an acceptable level of quality and safety pursuant to 10 CFR 50.55a(z)(1).

**6. Duration of Proposed Alternative**

This request, upon approval, will be applied to the NMP1, fifth 10-year interval, which began on January 1, 2019, and is scheduled to end on December 31, 2028.

**7. Precedent**

None

**8. References**

None