

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

June 3, 2021

Mr. David P. Rhoades Senior Vice President Exelon Generation Company, LLC President and Chief Nuclear Officer Exelon Nuclear 4300 Winfield Road Warrenville, IL 60555

SUBJECT: NINE MILE POINT NUCLEAR STATION, UNIT 1 – CORRECTION TO THE APRIL 22, 2021, SAFETY EVALUATION FOR REQUESTS FOR ALTERNATIVE TO THE INSERVICE TESTING REQUIREMENTS OF THE ASME OM CODE FOR THE FIFTH 10-YEAR PROGRAM INTERVAL (EPID L-2020-LLR-0136 AND L-2020-LLR-0137)

Dear Mr. Rhoades:

By letter dated October 8, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20282A331), Exelon Generation Company, LLC (the licensee) submitted alternative requests CTNSP-PR-01 Rev. 0 and CS-PR-01 Rev. 0 to the U.S. Nuclear Regulatory Commission (NRC). The licensee requested an alternative test plan in lieu of certain inservice testing (IST) requirements of the American Society of Mechanical Engineers (ASME) *Operation and Maintenance of Nuclear Power Plants*, Division 1 (OM Code) associated with the IST of certain pumps at Nine Mile Point Nuclear Station, Unit 1 (Nine Mile Point 1), during the fifth 10-year IST program interval. By letter dated April 22, 2021 (ADAMS Accession No. ML21109A216), the NRC staff authorized proposed alternative requests CTNSP-PR-01 Rev. 0 and CS-PR-01 Rev. 0.

By telephone call on April 29, 2021, Mr. Thomas Loomis of your staff informed the NRC staff of certain errors on pages 3 and 5 of the safety evaluation (SE) dated April 22, 2021. The errors relate to an incorrect description of the proposed alternatives. Specifically, in the SE, the NRC staff mistakenly referred to "quarterly and comprehensive testing" as "quarterly comprehensive testing." The NRC staff has corrected the errors. The specific changes are discussed below.

The paragraph on page 3 of the SE dated April 22, 2021 states:

The NRC staff reviewed the licensee's request and noted that in lieu of performing the periodic verification test once every 2 years per Mandatory Appendix V, the licensee has proposed to perform quarterly comprehensive testing. The quarterly comprehensive test requires more accurate pressure-monitoring instrumentation with a tighter acceptance band, flow measurement, and vibration monitoring for trending. Vibration analysis can detect bearing faults, motor/pump imbalances, impeller faults, and resonance problems. The pump test is performed at a reference value taken at approximately 80 percent of the pump's performance curve. In addition, the

licensee monitors other pump parameters such as bearing temperatures and periodic oil analysis, which can detect bearing wear and abnormal system operation such as water intrusion. These pumps have a good performance history with minimal maintenance required and data to support the continued testing following the comprehensive test requirements. The staff has determined that testing at a reference point of 80 percent of the pump's performance curve while applying multiple condition monitoring technologies can detect degradation of pump performance over time and provides reasonable assurance that they are operationally ready.

The revised paragraph, with changes noted in strikeout and boldface font, will state:

The NRC staff reviewed the licensee's request and noted that in lieu of performing the periodic verification test once every 2 years per Mandatory Appendix V, the licensee has proposed to perform guarterly testing per ASME OM Code requirements and comprehensive testing at the specified test interval per the ASME OM Code requirements and at established flow rate. The guarterly-comprehensive test requires more accurate pressure-monitoring instrumentation with a tighter acceptance band, flow measurement, and vibration monitoring for trending. Vibration analysis can detect bearing faults, motor/pump imbalances, impeller faults, and resonance problems. The pump test is performed at a reference value taken at approximately 80 percent of the pump's performance curve. In addition, the licensee monitors other pump parameters such as bearing temperatures and periodic oil analysis, which can detect bearing wear and abnormal system operation such as water intrusion. These pumps have a good performance history with minimal maintenance required and data to support the continued testing following the comprehensive test requirements. The staff has determined that testing at a reference point of 80 percent of the pump's performance curve while applying multiple condition monitoring technologies can detect degradation of pump performance over time and provides reasonable assurance that they are operationally ready.

The paragraph on page 5 of the SE dated April 22, 2021 states:

The NRC staff reviewed the licensee's request and noted that in lieu of performing the periodic verification test once every 2 years per Mandatory Appendix V, the licensee has proposed to perform guarterly comprehensive testing. The guarterly comprehensive test requires more accurate pressure-monitoring instrumentation with a tighter acceptance band, flow measurement, and vibration monitoring for trending. Vibration analysis can detect bearing faults, motor/pump imbalances, impeller faults, and resonance problems. The pump test is performed at a reference value taken at approximately 66 percent of the pump's performance curve. In addition, the licensee monitors other pump parameters such as bearing temperatures, and periodic oil analysis. Oil analysis can detect bearing wear and abnormal system operation such as water intrusion. These pumps have a good performance history with minimal maintenance required and data to support the continued testing following the comprehensive test requirements. The staff has determined that testing at a reference point of 66 percent of the pump's performance curve while applying multiple condition monitoring technologies can detect degradation

of pump performance over time and provides reasonable assurance that they are operationally ready.

The revised paragraph, with changes noted in strikeout and boldface font, will state:

The NRC staff reviewed the licensee's request and noted that in lieu of performing the periodic verification test once every 2 years per Mandatory Appendix V, the licensee has proposed to perform quarterly testing per ASME OM Code requirements and comprehensive testing at the specified test interval per the ASME OM Code requirements and at established flow rate. The guarterly comprehensive test requires more accurate pressure-monitoring instrumentation with a tighter acceptance band, flow measurement, and vibration monitoring for trending. Vibration analysis can detect bearing faults, motor/pump imbalances, impeller faults, and resonance problems. The pump test is performed at a reference value taken at approximately 66 percent of the pump's performance curve. In addition, the licensee monitors other pump parameters such as bearing temperatures, and periodic oil analysis. Oil analysis can detect bearing wear and abnormal system operation such as water intrusion. These pumps have a good performance history with minimal maintenance required and data to support the continued testing following the comprehensive test requirements. The staff has determined that testing at a reference point of 66 percent of the pump's performance curve while applying multiple condition monitoring technologies can detect degradation of pump performance over time and provides reasonable assurance that they are operationally ready.

Enclosed are the corrected SE pages with revision bars in the right margin indicating the changes. The errors in the SE dated April 22, 2021, do not change the NRC staff's conclusions regarding the alternative requests CTNSP-PR-01 Rev. 0 and CS-PR-01 Rev. 0 for Nine Mile Point 1.

If you have any questions, please contact the Nine Mile Point 1 Project Manager, Michael Marshall, at (301) 415-2871.

Sincerely,

/**RA**/

James G. Danna, Chief Plant Licensing Branch I Division of Operating Reactor Licensing Office of Nuclear Reactor Regulation

Docket No. 50-220

Enclosure: Corrected SE pages 3 and 5

cc: Listserv

# ENCLOSURE

# REVISED PAGES 3 AND 5 TO

# THE OFFICE OF NUCLEAR REACTOR REGULATION

# SAFETY EVALUATION DATED APRIL 22, 2021,

# ALTERNATIVE REQUESTS CTNSP-PR-01, REV. 0 AND CS-PR-01, REV. 0

RELATED TO THE INSERVICE TESTING PROGRAM FIFTH 10-YEAR INTERVAL

EXELON GENERATION COMPANY LLC

NINE MILE POINT NUCLEAR STATION UNIT 1

DOCKET NO. 50-220

monitoring of pump parameters such as motor-bearing temperatures, vibration monitoring, and periodic sampling of the lube oil shall be completed. In its request, the licensee stated that testing at a stable representative flow rate of approximately 80 percent and the additional monitoring of pump parameters is an effective way for detecting mechanical and hydraulic degradation and provides reasonable assurance of pump operational readiness.

### 3.1.2 NRC Staff Evaluation

The ASME OM Code Mandatory Appendix V requires safety-related pumps to have a periodic verification test program where the pumps are tested at their highest design-basis accident flow rate and pressure (differential or discharge as applicable). The test shall be completed at least once every 2 years. To comply with this new requirement, the system would have to be updated with an extensive modification. Compliance to meet the requirement to test these pumps at the highest design pressure value per Mandatory Appendix V would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The NRC staff reviewed the licensee's request and noted that in lieu of performing the periodic verification test once every 2 years per Mandatory Appendix V, the licensee has proposed to perform guarterly testing per ASME OM Code requirements and comprehensive testing at the specified test interval per the ASME OM Code requirements and at established flow rate. The comprehensive test requires more accurate pressure-monitoring instrumentation with a tighter acceptance band, flow measurement, and vibration monitoring for trending. Vibration analysis can detect bearing faults, motor/pump imbalances, impeller faults, and resonance problems. The pump test is performed at a reference value taken at approximately 80 percent of the pump's performance curve. In addition, the licensee monitors other pump parameters such as bearing temperatures and periodic oil analysis, which can detect bearing wear and abnormal system operation such as water intrusion. These pumps have a good performance history with minimal maintenance required and data to support the continued testing following the comprehensive test requirements. The staff has determined that testing at a reference point of 80 percent of the pump's performance curve while applying multiple condition monitoring technologies can detect degradation of pump performance over time and provides reasonable assurance that they are operationally ready.

### 3.2.1 Licensee's Alternative Request CS-PR-01, Rev. 0

### ASME OM Code Requirements

ISTB-1400, "Owners Responsibility" (d), states "establishing a pump periodic verification test program in accordance with Division 1, Mandatory Appendix V."

Mandatory Appendix V-2000, "Definitions," states that a "pump periodic verification test: a test that verifies a pump can meet the required (differential or discharge) pressure as applicable, at its highest design basis accident flow rate."

The NRC staff reviewed the licensee's request and noted that in lieu of performing the periodic verification test once every 2 years per Mandatory Appendix V, the licensee has proposed to perform quarterly testing per ASME OM Code requirements and comprehensive testing at the specified test interval per the ASME OM Code requirements and at established flow rate. The comprehensive test requires more accurate pressure-monitoring instrumentation with a tighter acceptance band, flow measurement, and vibration monitoring for trending. Vibration analysis can detect bearing faults, motor/pump imbalances, impeller faults, and resonance problems. The pump test is performed at a reference value taken at approximately 66 percent of the pump's performance curve. In addition, the licensee monitors other pump parameters such as bearing temperatures, and periodic oil analysis. Oil analysis can detect bearing wear and abnormal system operation such as water intrusion. These pumps have a good performance history with minimal maintenance required and data to support the continued testing following the comprehensive test requirements. The staff has determined that testing at a reference point of 66 percent of the pump's performance curve while applying multiple condition monitoring technologies can detect degradation of pump performance over time and provides reasonable assurance that they are operationally ready.

### 4.0 <u>CONCLUSION</u>

As set forth above, the NRC staff determined that the proposed alternatives CTNSP-PR-01 Rev. 0 and CS-PR-01 Rev. 0 provide reasonable assurance that the components listed in Tables 1 and 2 of this SE are operationally ready. The NRC staff also determined that the licensee has justified that compliance with the testing requirements in the ASME OM Code (2012 Edition) for the pumps listed in Tables 1 and 2 would result in hardship without a compensating increase in the level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(a)(z)(2).

All other ASME OM Code requirements for which relief was not specifically requested and approved in the subject requests for relief remain applicable.

Therefore, the NRC staff authorizes the proposed alternatives CTNSP-PR-01 Rev. 0 and CS-PR-01 Rev. 0 for the fifth 10-year IST interval at Nine Mile Point 1, which began on January 1, 2019, and is currently scheduled to end on December 31, 2028.

Principal Contributor: Michael Farnan, NRR

Date: April 22, 2021

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