



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

March 16, 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 - ISSUANCE OF
AMENDMENT NO. 245 FOR RELAXATION OF SURVEILLANCE FREQUENCY
FOR INSTRUMENT-LINE FLOW CHECK VALVE (EPID L-2020-LLA-0188)

Dear Mr. Rhoades:

The U.S. Nuclear Regulatory Commission (NRC, the Commission) has issued the enclosed Amendment No. 245 to Renewed Facility Operating License No. DPR-63 for the Nine Mile Point Nuclear Station, Unit No. 1 (Nine Mile Point 1). The amendment consists of changes to the technical specifications in response to Exelon Generation Company, LLC's (Exelon) application dated August 20, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20233A435), as supplemented by letters dated January 22 and January 27, 2021 (ADAMS Accession Nos. ML21022A010 and ML21027A185, respectively).

The amendment revises the primary containment isolation valves surveillance frequency from testing each instrument-line flow check valve to testing a representative sample of approximately 20 percent of the instrument-line flow check valves for each operating cycle with each instrument-line flow check valve being tested at least once every 10 years, consistent with Technical Specifications Task Force (TSTF) Traveler TSTF-334, Revision 2, "Relaxed Surveillance Frequency for Excess Flow Check Valve Testing," (ADAMS Accession No. ML003751245).

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

In its application, Exelon included a separate request for a proposed alternative for testing the instrument flow line check valves at Nine Mile Point 1 that are required in accordance with the American Society of Mechanical Engineers Operation and Maintenance Code requirements.

The NRC staff conducted a separate review of the proposed alternative, and the result of that review was communicated to Exelon in separate correspondence.

Sincerely,

/RA/

Michael L. Marshall, Jr., Senior Project Manager
Plant Licensing Branch I
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-220

Enclosures:

1. Amendment No. 245 to DPR-63
2. Safety Evaluation

cc: Listserv



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NINE MILE POINT NUCLEAR STATION, LLC

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-220

NINE MILE POINT NUCLEAR STATION, UNIT 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 245
Renewed License No. DPR-63

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Exelon Generation Company, LLC (Exelon Generation, the licensee) dated August 20, 2020, as supplemented by letters dated January 22 and January 27, 2021, 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. DPR-63 is hereby amended to read as follows:

- (2) Technical Specifications

- The Technical Specifications contained in Appendix A, which is attached hereto, as revised through Amendment No. 245, is hereby incorporated into this license. Exelon Generation shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented no later than the startup from the Nine Mile Point, Unit 1 spring 2021 refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION

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

Attachment:
Changes to the Renewed Facility
Operating License and Technical
Specifications

Date of Issuance: March 16, 2021

ATTACHMENT TO LICENSE AMENDMENT NO. 245

NINE MILE POINT NUCLEAR STATION, UNIT 1

RENEWED FACILITY OPERATING LICENSE NO. DPR-63

DOCKET NO. 50-220

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

3

Insert Page

3

Replace the following page of 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 Page

144

Insert Page

144



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 245

TO RENEWED FACILITY OPERATING LICENSE NO. DPR-63

NINE MILE POINT NUCLEAR STATION, LLC

EXELON GENERATION COMPANY, LLC.

NINE MILE POINT NUCLEAR STATION, UNIT 1

DOCKET NO. 50-220

1.0 INTRODUCTION

By letter dated August 20, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20233A435), as supplemented by letters dated January 22, 2021 (ADAMS Accession No. ML21022A010), and January 27, 2021 (ADAMS Accession No. ML21027A185), Exelon Generation Company, LLC (Exelon, the licensee), submitted a license amendment request (LAR) for Nine Mile Point Nuclear Station, Unit 1 (Nine Mile Point 1).

The supplemental letters dated January 22 and January 27, 2021, 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 October 6, 2020 (85 FR 63149).

Surveillance Requirement (SR) 4.3.4c in Technical Specification (TS) Section 3.3.4, "Primary Containment Isolation Valves," currently requires performance of SR 4.3.4c on each excess flow check valve (EFCV) during each refueling outage. The proposed amendment to adopt Technical Specifications Task Force (TSTF) Traveler TSTF-334, Revision 2, "Relaxed Surveillance Frequency for Excess Flow Check Valve Testing" (ADAMS Accession No. ML003751245), would revise the number of EFCVs required to be tested by TS SR 4.3.4c from "each" to "a representative sample." The representative sample is based on approximately 20 percent of the reactor instrumentation line EFCVs such that each EFCV will be tested at least once every 10 years (nominal). Therefore, approximately 20 percent of the EFCVs will be tested every operating cycle. The licensee stated that the reduced testing associated with the proposed change will result in an increase in the availability of the associated instrumentation during outages and will result in dose savings. Currently, SR 4.3.4c requires each instrument-line flow check valve to be tested on a 24-month frequency. At Nine Mile Point 1, EFCVs are known as instrument-line flow check valves.

2.0 REGULATORY EVALUATION

2.1 Component Description

The EFCVs in reactor instrumentation lines are used in boiling-water reactor (BWR) nuclear power plants to limit the release of fluid from the reactor coolant system in the event of an instrument-line break. EFCVs are not required to close in response to a containment isolation signal and are not postulated to operate under loss-of-coolant accident (LOCA) conditions. The EFCVs are not needed to mitigate the consequences of an accident because an instrument-line break coincident with a design-basis LOCA would be of a sufficiently low probability to be outside of the design basis. EFCVs are not required to close in response to a containment isolation signal and are not required to actuate to the isolation position under post-LOCA conditions as the lines are assumed to remain intact and proper instrument indication is desired for plant and operator response.

EFCVs are used in the instrument sensing lines of reactor protection systems, engineered safeguards systems, and reactor control systems of BWRs for sensing lines that are either (a) directly connected to the reactor coolant pressure boundary (RCPB), (b) open to the containment, or (c) connected to closed piping systems within the containment. The EFCVs limit the release of fluid from the reactor coolant system or contaminated air in the containment in the event of an instrument-line break or gross leakage from an instrument-line downstream of the EFCV.

The licensee stated that Section VI.D, "Containment Isolation System," of the Nine Mile Point 1 Updated Final Safety Analysis Report (UFSAR) (ADAMS Accession No. ML18022A443) indicates that the instrumentation lines penetrating the containment from the RCPB are provided with valves outside the containment to facilitate testing and maintenance. The licensee also stated that an EFCV is located outside primary containment. If an instrument-line that forms part of the RCPB develops a leak of sufficient flow outside containment, the licensee stated that the EFCV will automatically close.

2.2 Description of Proposed Changes

TS 3.3.4, "Primary Containment Isolation Valves," provide the requirements for the EFCVs along with other primary containment isolation valves (PCIVs). The PCIVs are required to be operable when the reactor coolant system temperature is greater than 215 degrees Fahrenheit. The EFCVs are required to be tested for operability under SR 4.3.4c. Currently, all EFCVs are tested each refueling outage pursuant to the surveillance frequency control program (SFCP) at Nine Mile Point 1. The proposed change would revise SR 4.3.4c to test a representative sample (i.e., approximately 20 percent) of instrument-line flow check valves for operability, in accordance with the SFCP, such that all instrument-line flow check valves will be tested at least once every 10 years (nominal).

2.3 Applicable Regulatory Requirements

Nine Mile Point 1 was not licensed to the general design criteria (GDC) in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants." The Nine Mile Point 1 UFSAR provides an assessment against the GDC in Table I-1, "Comparison to Standards - Historical (Provided with Application to Convert to Full-Term Operating License)." This UFSAR table refers to the Nine Mile Point 1 Technical Supplement to Petition for Conversion from Provisional Operating License to Full-Term Operating License,

July 1972, for the details of the assessment against the GDC current at that time. A review by the NRC staff determined that the plant-specific requirements for Nine Mile Point 1 are sufficiently similar to the Appendix A GDC as related to the proposed change. Therefore, the NRC staff reviewed the amendment requests for the Nine Mile Point 1 license using the 10 CFR Part 50, Appendix A GDC unless there are specific criteria identified in the UFSAR.

GDC 55, "Reactor coolant pressure boundary penetrating containment," and GDC 56, "Primary containment isolation," contained in Appendix A to 10 CFR Part 50 provide design requirements for isolation of lines that penetrate the primary containment. Instrument lines that monitor the reactor pressure vessel or containment internal conditions are subject to isolation requirements, but as noted in the GDCs, "unless it can be demonstrated that the containment isolation provisions for a specific class of lines, such as instrument lines, are acceptable on some other defined basis." An alternate licensing basis acceptable to the NRC for isolation of instrument lines connected to the RCPB is described in NRC Regulatory Guide (RG) 1.11, Revision 1, "Instrument Lines Penetrating the Primary Reactor Containment," March 2010 (ADAMS Accession No. ML100250396).

A specific criterion identified in the Nine Mile Point 1 UFSAR (i.e., Criterion 15), requires:

A reliable reactor protection system must be provided to automatically initiate appropriate action to prevent safety limits from being exceeded. Capability must be provided for testing functional operability of the system and for determining that no component or circuit failure has occurred. For instruments and control systems in vital areas where the potential consequences of failure require redundancy, the redundant channels must be independent and must be capable of being tested to determine that they remain independent. Sufficient redundancy must be provided that failure or removal from service of a single component or channel will not inhibit necessary safety action when required. These criteria should, where applicable, be satisfied by the instrumentation associated with containment closure and isolation systems, after heat removal and core cooling systems, systems to prevent cold-slug accidents, and other vital systems, as well as the reactor nuclear and process safety system.

Section 50.36, "Technical specifications," of 10 CFR provides the regulatory requirements for the content of the TSs. The regulation at 10 CFR 50.36(a)(1) requires an applicant for an operating license to include in the application proposed TSs in accordance with the requirements of 10 CFR 50.36. Specifically, 10 CFR 50.36(c) requires that TSs include items in five specific categories related to station operation. These categories are: (1) safety limits, limited safety system settings, and limiting control settings; (2) limiting conditions for operation; (3) SRs; (4) design features; and (5) administrative controls.

The regulation at 10 CFR 50.36(c)(3) requires TS to include items in the category of SRs, which 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 limiting conditions for operation will be met.

The regulation at 10 CFR 100.11(a) requires, in part:

- (1) An exclusion area of such size that an individual located at any point on its boundary for two hours immediately following onset of the postulated fission product release would not receive a total radiation dose to the whole body in excess of 25 rem [roentgen equivalent man, a unit used to measure the dose equivalent, which is a measure of the biological damage to living tissue as a result of radiation exposure] or a total radiation dose in excess of 300 rem to the thyroid from iodine exposure.
- (2) A low population zone of such size that an individual located at any point on its outer boundary 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 total radiation dose to the whole body in excess of 25 rem or a total radiation dose in excess of 300 rem to the thyroid from iodine exposure.

The regulation at 10 CFR 50.67(b)(2)(i) requires that 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 and 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 Sievert (Sv) (25 rem) total effective dose equivalent (TEDE). Additionally, 10 CFR 50.67(b) requires that 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.

2.4 Applicable Regulatory Guidance

NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition" (SRP), Section 15.6.2, "Radiological Consequences of the Failure of Small Lines Carrying Primary Coolant Outside Containment," Revision 2 (ADAMS Accession No. ML052350147), provides guidance to the NRC staff for the review of the radiological consequences of failures outside the containment of small lines connected to the primary coolant pressure boundary, such as instrument lines and sample lines. SRP Section 15.6.2 states, in part, that the NRC reviewer should evaluate the proposed change against 10 CFR 100.11, such that the calculated whole body and thyroid doses at the exclusion area and the low population zone outer boundaries do not exceed a small fraction of the exposure guideline values of 10 CFR 100.11. A "small fraction" of 10 CFR Part 100 means 10 percent of these exposure guideline values, that is, 2.5 rem and 30 rem for the whole body and thyroid doses, respectively.

RG 1.11, Revision 1, "Instrument Lines Penetrating the Primary Reactor Containment," describes a suitable basis which may be used to implement GDC 55 and 56 for demonstrating the acceptability of instrument sensing lines. RG 1.11 provides important distinctions in design guidance for instrument lines that serve protection system instrument functions from instrument lines that do not serve protection functions. Specifically, RG 1.11 states that:

Lines connected to instruments that are part of the protection system are extensions of that system and should satisfy the requirements for redundancy, independence, and testability for the protection system, to assure that the protective function will be accomplished. Lines connected

only to instruments that are not part of the protection system need not meet the requirements of the protection system. For these [non-protection system] lines, the assurance that isolation can be effected when required is of greater importance to safety than the capability of the connected instrument function.

TSTF-334, Revision 2 provides a revision to the plant-specific SR equivalent to Standard Technical Specifications (STS) 3.6.1.3, "Primary Containment Isolation Valves (PCIVs)," to allow a representative sample (i.e., approximately 20 percent) of reactor instrumentation line EFCVs to be periodically tested during each refueling outage in accordance with the plant SFCP. Prior to the development of TSTF-334, BWR plants, like Nine Mile Point 1, TSs required testing of each EFCV once every refueling outage. The justification supporting TSTF-334, Revision 2 was that "operating experience demonstrates that EFCVs are highly reliable and that the incidence of test failures is extremely low." The TSTF is based on the STS. The licensee stated that the Nine Mile Point 1 TS are custom TS that are in a different format and have different numbering and titles than the STS in NUREG-1433, "Standard Technical Specifications - General Electric Plants (BWR/4)," April 2012 (ADAMS Accession No. ML12104A192). The licensee provided the example that the Nine Mile Point 1 TS does not use the term "excess flow check valve," but rather uses the term "instrument-line flow check valve." However, the substance of Nine Mile Point 1 TS are sufficiently similar to the STS that the guidance in the TSTF is applicable to Nine Mile Point 1.

2.5 Previous NRC Approvals

BWR Owners Group (BWROG) Topical Report (TR) NEDO-32977-A, "Excess Flow Check Valve Testing Relaxation," June 2000 (ADAMS Accession No. ML003729011), provides a technical basis for the proposed change. The TR provides justification, in general, for implementation of TSTF-334, Revision 2 (ADAMS Accession No. ML003775261). The NRC safety evaluation (SE), dated March 14, 2000 (ADAMS Accession No. ML003691722), associated with the approval of TR NEDO-32977-A states the NRC's position on the industry's implementation plan for relaxing the EFCV surveillance frequency. The NRC agreed that the test interval could be extended up to a maximum of 10 years. In conjunction with this finding, the NRC noted that each licensee that adopts the relaxed test interval program for EFCVs must have a failure feedback mechanism and corrective action program to ensure that EFCV performance and reliability continues to be bounded by the TR NEDO-32977-A results. Each licensee that seeks to adopt the relaxed test interval program for EFCVs is required to perform a plant-specific radiological dose assessment, EFCV failure analysis, and release frequency analysis to confirm that their results are bounded by the generic analyses of the TR NEDO-32977-A.

On December 19, 2007, the Commission issued Amendment No. 194 to Renewed Facility Operating License No. DPR-63 for Nine Mile Point 1 (ADAMS Accession No. ML073230597). The amendment revised the accident source term in the design-basis radiological consequence analyses in accordance with 10 CFR 50.67, which requires licensees who seek to revise their accident source term to apply for a license amendment under 10 CFR 50.90. The revised accident source term revision replaces the methodology that is based on Technical Information Document (TID)-14844, "Calculation of Distance Factors for Power and Test Reactor Sites," with the alternate source term methodology described in Regulatory Guide 1.183, "Alternative Radiological Source Terms for Evaluating Design-Basis Accidents at Nuclear Power Reactors," (ADAMS Accession No. ML003716792) with the exception that TID-14844 will continue to be used as the radiation dose basis for equipment qualification and vital area access.

3.0 TECHNICAL EVALUATION

TSTF-334, Revision 2 directs that licensees should evaluate any failure of a valve to isolate during performance testing, and to determine if additional testing (i.e., increased sample size) within that test interval is warranted to ensure the overall reliability (of valve actuation on simulated demand) is maintained. According to TSTF-334, Revision 2, the licensee must provide at least the following two sets of information: (a) demonstrate that the EFCV performance and failure rate for their plant EFCVs is comparable to that which has been documented in TR NEDO-32977-A; and (b) provide the EFCV performance test criteria and basis for NRC staff review and approval.

The NRC staff considers instrument lines to constitute closed, extended containment boundary system piping outside containment. RG 1.11, Revision 1 accepts instrument lines as extensions of the primary containment, and allows that their configuration satisfies the "other defined basis" requirements of GDCs 55 and 56. The licensee stated that where check valves are used as one or both of a set of double isolation valves, automatic isolation of instrument lines during a LOCA is not prudent. This is because these instrument lines provide safety functions for reactor protection and containment isolation which need to be operable during a LOCA.

The NRC staff evaluated the LAR to determine if the proposed changes are consistent with the applicable regulations and regulatory guidance. Specifically, the staff reviewed the licensee's application for conformance to the TR NEDO-32977-A SE dated March 14, 2000, and TSTF-334, Revision 2. The acceptance criteria relate to, and the staff's evaluation encompassed, the following areas of concern: (1) radiological dose assessment, (2) EFCV failure rate and release frequency, (3) licensee's failure feedback mechanism, and (4) conformance of revised TS to generic TS guidance. The licensee also provided, and the NRC staff reviewed, the potential environmental effects of approving the LAR.

Because Nine Mile Point 1 has custom TSs, the NRC staff's evaluation of the proposed changes to the SR include the differences between the STS and custom TS to determine if the TSTF and its conclusions are applicable to Nine Mile Point 1.

3.1 Release Frequency and Radiological Dose Assessment

The NRC staff reviewed the Nine Mile Point 1 EFCV release frequency analysis and the consequences of the release, which are provided in GE Hitachi (GEH) Report 006N1767, which is Attachment 2 to the LAR. The release frequency analysis for Nine Mile Point 1 in GEH Report 006N1767 follows the methodology in Sections 3.1 (failure to close) and 4.3 (release frequency) of TR NEDO-32977-A. Under this methodology, a postulated radiological release would occur due to an instrument-line break coupled with an EFCV that fails to close after receiving the isolation signal from the main control room. The release frequency calculations are based on a single instrument-line break frequency per year and EFCV failure to close probability (i.e., EFCV unavailability). The release frequency estimates for Nine Mile Point 1 were calculated based on a single instrument-line break frequency of $5.34\text{E-}6/\text{year}$ and an EFCV failure rate of $1.44\text{E-}6/\text{hr}$. Based on the licensee's release frequency estimates, assuming 52 instrument lines with testable EFCVs, the release frequency from a broken instrument-line was calculated to be approximately $3.51\text{E-}6$ events/year for the current 2-year surveillance test interval. For the proposed extended 10-year EFCV testing interval, the release frequency from a broken instrument-line was calculated to be approximately $1.76\text{E-}5$ events/year

The risk to the public can be shown by combining the release frequencies with a consequence of the release. The corresponding public risk with current 2-year testing interval can be shown to be 1.8E-4 millirem (mRem)/year (whole body). With an extended 10-year testing interval, this value changes to 8.8E-4 mRem/year (whole body). These values are derived using the method in the TR, which utilizes 0.05 Rem/event. This is significantly below the 100 mRem/year NRC dose limit for individual members of the public established in 10 CFR 20.1301(a) and below the U.S. Environmental Protection Agency generally applicable environmental radiation standard dose limit of 25 mRem/year in 10 CFR 20.1301(e). Because the potential dose to the public resulting from an extended EFCV testing interval continues to comply with the regulatory dose limit, the NRC staff finds the proposed extended test frequency to be acceptable with respect to release frequency.

The radiological consequences for an instrument-line break were previously evaluated in the December 19, 2007, SE associated with Amendment No. 194 for Nine Mile Point 1. The amendment adopted full implementation of the alternative source term (AST) methodology. In the SE, it is stated:

The licensee stated, and the NRC staff agrees, that AST analyses have determined that the design-basis [main steam line break] MSLB accident is more limiting than the previously-analyzed small-break LOCA outside of the [Primary Containment] PC [...]

The small-break LOCA events include postulated instrument-line breaks and are therefore bounded by the MSLB accident. The assumptions of the accident analysis associated with small-break LOCA events do not change as a result of the licensee's proposed EFCV surveillance intervals. As a result, a failure of an EFCV is bounded by the licensee's previous analysis and is consistent with the TR results. The radiation dose consequences for an instrument-line break are not impacted by the proposed change. Because the potential dose to the public resulting from an extended EFCV testing interval continues to comply with the regulatory dose limit, the NRC staff finds the proposed extended test frequency to be acceptable with respect to release frequency.

The NRC staff has evaluated the impact of the proposed change on the design-basis instrument-line break radiological consequence analysis against the regulatory requirements and guidance. The NRC staff finds, with reasonable assurance that the licensee's change to the TSs will continue to comply with regulatory requirements and the current radiological consequence analysis. Therefore, the proposed change is acceptable with regard to the radiological consequences of the postulated instrument-line break.

3.2 EFCV Failure Rate and Feedback Mechanism

The manufacturer of the Nine Mile Point 1 instrument-line flow check valves is Dragon Valves. As stated in Section 3.0 of the LAR and Section 4.0 of GEH Report 006N1767, Revision 0, the Nine Mile Point 1 valves are similar (same manufacturer and type) to the valves used by the other member utilities as listed in TR NEDO-32977-A. Nine Mile Point 1 specific data was found to be consistent in both the time sampled and valve reliability when compared to the TR data; therefore, the conclusions found in TR NEDO-32977-A are applicable to the Nine Mile Point 1 EFCV system.

In its SE dated March 14, 2000 on TR NEDO-32977-A, the NRC staff noted the importance of an EFCV failure feedback mechanism and that a plant's corrective action program must evaluate equipment failures and establish appropriate corrective actions. As discussed in Section 3.1.1.2 of the NRC staff's SE on the TR, the BWROG responded to an NRC staff request for additional information concerning the EFCV failure feedback mechanism by stating that each licensee that adopts the relaxed surveillance intervals recommended by the TR should ensure that an appropriate feedback mechanism responsive to EFCV failure trends is in place.

In its January 22, 2021, supplement to the LAR, the licensee stated that it will use the inservice testing (IST) program to track the performance of the EFCVs. The licensee has established a minimum performance standard, which will require less than or equal to one failure during a 24-month rolling average to ensure that adverse trends in EFCV performance are identified and dispositioned in the CAP. The licensee indicated that failures will be evaluated against the performance criteria with appropriate corrective actions taken based on the failure analysis and trend in failures. The licensee also stated that if EFCV failures exceed the performance standard described above, the IST Program Plan will require a cause evaluation and determination of additional testing requirements. The licensee specified that failed EFCVs will be retested during the next refueling outage.

Based on the licensee's information contained in the LAR and its supplements, the NRC staff has determined that Nine Mile Point 1 instrument-line flow check valves have exhibited historical performance comparable to the TR data and that the request is consistent with TSTF-334, Revision 2, for allowing the requested change. Therefore, the NRC staff finds the licensee's request to revise SR 4.3.4c in Nine Mile Point 1 TS 3.3.4 to allow for a representative sample of instrument-line flow check valves to be tested each refueling outage such that the maximum test interval for each individual check valve is 10 years, is acceptable and will provide reasonable assurance that high instrument-line flow check valve reliability will be maintained.

The testing frequency in TSTF-334, Revision 2, allows the functional operability of reactor protection system functions, that rely on instruments connected to impulse lines with instrument-line flow check valves. However, the check valves are not verified for up to ten years. The failure of an instrument-line flow check valve to its closed position when not needed could result in the occurrence of confusing or anomalous reactor protection system functions and indications.

Many of the instrument-line flow check valves are on instrument sensing lines that provide impulse signals to key reactor protection system functions, like safety related reactor water level, reactor pressure, or reactor recirculation system flow monitoring instrument channels that provide input to flow-based average power range monitor trips. It is possible that an instrument-line flow check valve on an instrument-line serving one or more of these reactor protection system functions could fail shortly after being tested during the last surveillance interval, and is in a failed condition that restricts flow resulting in confusing or anomalous signals to the control room and reactor protection system functions. If the valve has failed to its "check" position, it could remain in a failed condition until the next surveillance testing which may not occur for up to 10 years. In the LAR and its supplements, the license described how this type of failure will be detected and corrected in a timely fashion:

During normal plant operation, [Nine Mile Point 1] performs shiftly or daily checks to verify the operability of reactor protection system (RPS) instruments in accordance" with Technical Specification (TS) Surveillance Requirement (SR)

sensor checks. The procedures are structured such that the RPS channels for each parameter are compared to assure that the maximum channel-to-channel deviation is within acceptable guide values. This check verifies the operational status of the excess flow check valve and manual valves during operating conditions. Should any of the three valves in the standard instrument-line configuration be closed, a deviation outside the guide value would be detected during the operating cycle and indicate a potential operability issue which would then be entered into CAP. The CAP would then be used to document operability with the affected instruments, any needed compensatory actions and TS required actions.

The flow-biased reactor power trip channel, which receives input from flow sensors connected to the reactor recirculation lines, is also checked daily to detect potential operability concerns. Although not required by the TS, this check is procedurally controlled. Other reactor pressure and reactor steam dome pressure instruments servicing protection functions are also not covered by TS related sensor checks. These instruments are however attached to instrument lines that are also used for other protective functions that are specifically covered by TS sensor check SRs.

Although not required by the TS, this check is procedurally controlled. Other reactor pressure and reactor steam dome pressure instruments servicing protection functions are also not covered by TS related sensor checks. These instruments are however attached to instrument lines that are also used for other protective functions that are specifically covered by TS sensor check SRs.

The use of frequent sensor checks of RPS instruments as identified in the [Nine Mile Point 1] TS provides a measure for identifying degradation in the protection system functions that compensate for a reduction in surveillance frequency of the instrument-line excess flow check valves.

Also, in its supplements, the licensee described the Nine Mile Point 1 capabilities and planned actions for detecting, identifying, and taking timely corrective actions to restore reliability of the RPS functions (or to achieve any required RPS functions) in the event of a failure of an instrument-line flow check valve that occurs in between functional tests of the valve.

The NRC staff finds that Criterion 15 will be maintained because of the licensee's use of frequent sensor checks of RPS instruments as identified in the Nine Mile Point 1 TS provides a measure for identifying degradation in the protection system functions that sufficiently compensates for a reduction in surveillance frequency of the instrument-line excess flow check valves.

3.3 Evaluation of Revised Technical Specification Surveillance Requirement

The Nine Mile Point 1 TSs are custom TS and are a different format with different numbering and titles than the NRC Improved STS in NUREG-1433, on which TSTF-334, Revision 2 is based. The Nine Mile Point 1 custom TS uses the term "instrument-line flow check valve" instead of "excess flow check valve." These variations do not affect the applicability of TSTF-334, Revision 2, to the Nine Mile Point 1 TS.

The licensee requested that SR 4.3.4c for EFCV testing be modified to allow a representative sample (about 20 percent) of the valves to be tested instead of testing all the valves every refueling outage. The change would allow all the valves to be tested within a 10-year period. The licensee stated that the change in test frequency is acceptable because of the high reliability of the valves and the low consequences of an EFCV failure as demonstrated in the industry TR. As discussed in this SE, the NRC staff determined that the report was applicable to Nine Mile Point 1 and that the TR conclusions are valid for the plant. The NRC staff finds that the revision of SR 4.3.4c to change the test frequency for the EFCVs is acceptable because the EFCVs have reasonable assurance to fulfill the required safety functions, even with a reduced testing frequency.

Because the licensee provided reasonable assurance that the EFCVs will retain the required ability to isolate a broken instrument-line, the NRC staff concludes that the proposed TS changes are acceptable. Accordingly, the NRC staff finds that the proposed revision of SR 4.3.4c for the EFCVs is acceptable because the licensee demonstrated that a reduced test frequency would not significantly affect valve reliability, and the licensee included the limitations necessary to assure this conclusion as part of the proposed change.

3.4 Technical Conclusion

The NRC staff concludes that the Nine Mile Point 1 EFCV failure rate analysis data are consistent with the EFCV failure rate analysis for the 12 BWR nuclear power plants referenced in TR NEDO-32977-A. The licensee demonstrated that the TR was applicable to Nine Mile Point 1 plant specific conditions such that the TR provided justification for the change at the plant to relax the SR to test a representative sample of instrument line flow check valves at the current 24 month interval required by the SFCP. Based on the acceptability of the methods used in GEH Report 006N1767, Revision 0, which estimate the release frequency from EFCV failures at Nine Mile Point 1, and the low release frequency estimate from an EFCV failure, and the licensee's failure feedback mechanism and CAP, the NRC staff determined that the increase in risk associated with the Nine Mile Point 1 request for a revision to the EFCV surveillance testing frequency is minimal. Therefore, the NRC staff concludes that the LAR proposed by the Nine Mile Point 1 licensee to modify the Nine Mile Point 1 TS in SR 4.3.4c to require a representative sample of reactor instrument-line EFCVs based on approximately 20 percent of those EFCVs with each EFCV tested at least once every 10 years is acceptable.

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 on February 12, 2021. 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 SRs. 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 (85 FR 63149). 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.

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Date: March 16, 2021

SUBJECT: NINE MILE POINT NUCLEAR STATION, UNIT 1 - ISSUANCE OF
AMENDMENT NO. 245 FOR RELAXATION OF SURVEILLANCE FREQUENCY
FOR INSTRUMENT-LINE FLOW CHECK VALVE (EPID L-2020-LLA-0188)
DATED MARCH 16, 2021

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