From:	Marshall, Michael
To:	[Licensee] Ron Reynolds (Exelon)
Cc:	Danna, James
Subject:	NINE MILE POINT NUCLEAR STATION, UNIT 1 – REQUEST FOR ADDITIONAL INFORMATION CONCERNING REVIEW OF LICENSE AMENDMENT REQUEST AND RELIEF REQUEST TO CHANGE EXCESS FLOW CHECK VALVE TESTING FREQUENCY (EPIDS L-2020-LLA-0188 AND L-2020-LLR-0114)
Date:	Wednesday, December 30, 2020 6:49:00 AM

Hello Ron:

By letter dated August 20, 2020, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20233A435) Exelon Generation Company, LLC (Exelon) submitted a license amendment request and relief request to change excess flow check valve testing frequency for the Nine Mile Point Nuclear Station, Unit 1 (Nine Mile Point 1). The license amendment request proposes to adopt a NRC-approved Technical Specification Task Force 334, "Relaxed Surveillance Frequency for Excess Flow Check Valve (EFCV) Testing," Revision 2 to revise Surveillance Requirement 4.3.4c in Technical Specifications 3.3.4, "Primary Containment Isolation Valves (PCIVs)." Section 36(c)(3) of Part 50 of Title 10 of the *Code of Federal Regulations* (10 CFR) requires, in part, that technical specifications include surveillance requirements to assure the necessary quality of a component (e.g., instrument-line flow check valves) is maintained.

The U.S. Nuclear Regulatory Commission staff has reviewed the information provided in the license amendment request and has determined that additional information is needed to complete its review. The response to the request for additional information was discussed with you on December 29, 2020, and it was agreed that your response would be provided within 30 days of the date of this email.

RAI

1. In its request, the licensee states that it relies on General Electric Nuclear Energy Topical Report NEDO-32977-A, "Excess Flow Check Valve Testing Relaxation," dated June 2000 (ADAMS Accession No. ML003729011), which the NRC staff accepted in a safety evaluation dated March 14, 2000. The topical report provides a basis for changing the surveillance requirement for instrument-line flow check valves (i.e., excess flow check valves). NEDO-32977 specifies that licensees must have a failure feedback mechanism and corrective action program to ensure that EFCV performance continues to be bounded by the topical report results. Section 3.2 of the licensee's submittal states that "The [Nine Mile Point 1] Maintenance Rule Program per NEI 18-10 currently tracks failures and establishes corrective actions based on risk assessments as appropriate." However, the license amendment request does not provide enough detail on how the Nine Mile Point 1 Maintenance Rule Program complies with the provisions of NEDO-32977-A.

    a. Please provide a detailed description as to how the Nine Mile Point 1 Maintenance Rule Program ensures that the instrument-line flow check valves performance continues to meet established performance criteria and is bounded by the topical report results. The description needs to include a description of the instrument-line flow check valves performance criteria and how the performance criteria are met. Describe the specific instrument-line flow check valves performance test acceptance criteria and basis that will be used to ensure that the corrective action program provides meaningful feedback.

b. Please describe actions that will be taken if surveillance results indicate a higher-than-expected failure rate for instrument-line flow check valves. Provide the acceptance criteria and basis that will be used to evaluate instrument-line flow check valves failures that may occur during any refueling outage test interval to determine whether testing of additional instrument-line flow check valves within that test interval is warranted to ensure the overall reliability acceptance criterion applicable to Nine Mile Point Unit 1 is maintained.

2. In the license amendment request, the licensee stated, in part:

> The NMP1 Updated Final Safety Analysis Report (UFSAR) Section VI.D., 'Containment Isolation System,' describes that instrumentation lines penetrating containment from the reactor coolant pressure boundary (RCPB) are provided with valving outside the containment to facilitate testing and maintenance. Additionally, an instrument-line flow check valve is located outside primary containment. Should an instrument-line that forms part of the RCPB develop a leak of sufficient flow outside containment, the instrument-line flow check valve will close automatically.

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. From the amendment request it is unclear how this type of failure will be detected and corrected in a timely fashion. In case of an accident the presence of a failed instrument-line flow check valve could result in a reactor protection function to be disabled.

The staff is reviewing the proposed change against the following Nine Mile Point 1 Principal Design Criteria:

> Criterion 15
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> 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, afterheat 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.

Criterion 17

> The containment structure, including access openings and penetrations, must be designed and fabricated to accommodate or dissipate without failure the pressures and temperatures associated with the largest credible energy release including the effects of credible metal-water or other chemical reactions uninhibited by active quenching systems. If part of the primary coolant system is outside the primary reactor containment, appropriate safeguards must be provided for that part if necessary, to protect the health and safety of the public, in case of an accidental rupture in that part of the system. The appropriateness of safeguards such as isolation valves, additional containment, etc., will depend on environmental and population conditions surrounding the site.

Based on the requirement of Criterion 15, "A reliable reactor protection system must be provided to automatically initiate appropriate action to prevent safety limits from being exceeded." Criterion 15 also states that capability must be provided for testing functional operability of the system and for determining that no component (such as an instrument-line flow check valve) or circuit failure has occurred. Prior to implementing TSTF-334, functional operability of the reactor protection system, inclusive of the instrument-line flow check valves, was verified by the Nine Mile Point Unit 1 staff at least once per refueling outage (approximately once every two years). After the proposed implementation of TSTF-334, it is possible that functional operability of reactor protection system functions that rely on instruments connected to impulse lines with instrument-line flow check valves will not be verified for up to ten years. The failure of an instrument-line flow check valve could result in the occurrence of confusing or anomalous reactor protection system functions and indications.

Please describe the Nine Mile Point Unit 1 capabilities and planned actions for detecting, identifying, and taking timely corrective actions to restore reliability of the reactor protection system functions (or to achieve any required reactor protection system functions) in the event of a failure of an instrument-line flow check valve that occurs in between functional tests of the valve.

Best Regards,
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Senior Project Manager

Plant Licensing Branch I
Division of Operating Reactor Licensing
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301-415-2871

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