



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

March 22, 2017

Mr. Bryan C. Hanson
President and Chief
Nuclear Officer
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: NINE MILE POINT NUCLEAR STATION, UNIT 1 – STAFF REVIEW OF
MITIGATION STRATEGIES ASSESSMENT REPORT OF THE IMPACT OF THE
REEVALUATED SEISMIC HAZARD DEVELOPED IN RESPONSE TO THE
MARCH 12, 2012, 50.54(f) LETTER

Dear Mr. Hanson:

The purpose of this letter is to provide the U.S. Nuclear Regulatory Commission's (NRC) assessment of the seismic hazard mitigation strategies assessment (MSA), as described in the November 2, 2016, letter (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16307A017), submitted by Exelon Generation Company, Inc. (Exelon, the licensee) for Nine Mile Point Nuclear Station, Unit 1 (NMP1). The NRC staff evaluated the NMP1 strategies as developed and implemented under order EA-12-049, as described in the NMP1 final integrated plan (ADAMS Accession No. ML15163A097). The staff's review of NMP1's mitigation strategies has been documented in a safety evaluation (ADAMS Accession No. ML17009A141). The purpose of the safety evaluation is to ensure the licensee has developed guidance and proposed designs which, if implemented appropriately, will adequately address the requirements of Order EA-12-049. An inspection will confirm compliance with the order. The following NRC staff review confirms that the licensee has adequately addressed the reevaluated seismic hazard within NMP1's mitigation strategies for beyond-design-basis external events.

BACKGROUND

By letter dated March 12, 2012 (ADAMS Accession No. ML12053A340), the NRC issued a request for information pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.54(f) (hereafter referred to as the 50.54(f) letter). The 50.54(f) letter was issued as part of implementing lessons-learned from the accident at the Fukushima Dai-ichi nuclear power plant. Enclosure 1 to the 50.54(f) letter requested licensees reevaluate the seismic hazard using present-day methodologies and guidance. Concurrent with the reevaluation of seismic hazards, the NRC issued Order EA-12-049, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (ADAMS Accession No. ML12054A736). The order requires holders of operating power reactor licenses and construction permits issued under 10 CFR Part 50 to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool cooling following a beyond-design-basis external event.

By letter dated March 31, 2014 (ADAMS Accession No. ML14099A196), the licensee (previously doing business as Constellation Energy), provided its reevaluated seismic hazard for NMP1 in response to the 50.54(f) letter.

On December 10, 2015 (ADAMS Accession No. ML16005A621), the Nuclear Energy Institute (NEI) submitted Revision 2 to NEI 12-06, including guidance for conducting MSAs using the reevaluated hazard information. The NRC subsequently endorsed NEI 12-06, Revision 2, with exceptions, clarifications, and additions, in Japan Lessons-Learned Division (JLD) interim staff guidance (ISG) JLD-ISG-2012-01, Revision 1, "Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" (ADAMS Accession No. ML15357A163).

MITIGATION STRATEGIES ASSESSMENT

By letter dated June 16, 2015 (ADAMS Accession No. ML15153A660), the NRC staff documented its review of the licensee's reevaluated seismic hazard, also referred to as the mitigation strategies seismic hazard information. The staff found the NMP1 Ground Motion Response Spectrum (GMRS) in the 1 to 10 Hertz (Hz) range had only a slight exceedance of the safe shutdown earthquake (SSE) between 9 and 10 Hz, but exceeds the SSE above 10 Hz, meriting a high frequency (HF) confirmation. In addition, the staff concluded that the GMRS determined by the licensee adequately characterizes the reevaluated seismic hazard for the NMP1 site.

For clarity, the staff notes that licensee statements in the Seismic Hazard and Screening Report and the MSA report regarding GMRS not exceeding the SSE in the 1-10 Hz range are based on the ground response spectrum developed for the NRC's Systematic Evaluation Program, which differs slightly from the licensing basis SSE spectrum. The NRC staff assessment used the licensing basis SSE spectrum for comparison to the GMRS, and this comparison results in a narrow band exceedance in the 9-10 Hz range. The difference did not impact the NMP1 screening because it met the narrow band exceedance criteria in the screening guidance.

By letter dated November 2, 2016 (ADAMS Accession No. ML16307A018), Exelon submitted a High Frequency Confirmation Report for NMP1. By letter dated February 6, 2017 (ADAMS Accession No. ML17031A156), the NRC staff concluded, based on its review, that the licensee correctly implemented the HF guidance in conducting the HF confirmation for NMP1. Eight components, that did not demonstrate adequate seismic capacity, were dispositioned by crediting operator actions that would confirm or restore their functionality following a seismic event. No component modifications were required.

By letter dated November 2, 2016 (ADAMS Accession No. ML16307A017), Exelon submitted a Mitigation Strategies Assessment Report for NMP1. The licensee stated that the NMP1 MSA was performed consistent with NEI 12-06, Revision 2. Appendix H of NEI 12-06, Revision 2, describes acceptable methods for demonstrating that the reevaluated seismic hazard is addressed within the NMP1 mitigation strategies for beyond-design-basis external events. The NRC staff confirmed that the licensee's seismic hazard MSA is consistent with the guidance in Appendix H.4.2 of NEI 12-06, Revision 2, as endorsed by JLD-ISG-2012-01, Revision 1. Therefore, the methodology used by the licensee is appropriate to perform an assessment of the mitigation strategies that addresses the reevaluated seismic hazard.

The staff reviewed the licensee's description of the component selection process for the MSA. The staff found the licensee provided sufficient detail in describing the selection process and provided a clear list of references used to support the selection process via the referenced NMP1 HF confirmation report (ADAMS Accession No. ML16307A018). The staff also confirmed that the selected components support at least a single shutdown path that is consistent with the NMP1 Final Integrated Plan (ADAMS Accession No. ML15163A097) submitted in response to Order EA-12-049.

The licensee provided the seismic equipment list for the MSA in Table A-1. The licensee identified 16 components for which an HF confirmation evaluation was required. The licensee stated that the components were reviewed as part of the NMP1 HF confirmation. The staff confirmed that all 16 components were part of the NMP1 HF confirmation report. The staff review of these 16 components is documented in NRC letter dated February 6, 2017 (ADAMS Accession No. ML17031A156). The staff previously found that all 16 components had seismic capacity greater than demand as part of the HF confirmation evaluation submitted in response to the 50.54(f) letter.

The NRC staff completed its review of the seismic hazard MSA for NMP1. The NRC staff concludes that sufficient information has been provided to demonstrate that the licensee's plans for the development and implementation of guidance and strategies under Order EA-12-049 appropriately address the reevaluated seismic hazard information stemming from the 50.54(f) letter.

If you have any questions, please contact me at (301) 415-3041 or via e-mail at Stephen.Wyman@nrc.gov.

Sincerely,



Stephen Wyman, Project Manager
Hazards Management Branch
Japan Lessons-Learned Division
Office of Nuclear Reactor Regulation

Docket No. 50-220

cc: Distribution via Listserv

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