



Order No. EA-12-049

RS-16-086

May 26, 2016

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Quad Cities Nuclear Power Station, Units 1 and 2
Renewed Facility Operating License Nos. DPR-29 and DPR-30
NRC Docket Nos. 50-254 and 50-265

Subject: Mitigating Strategies Assessment (MSA) Report for the New Seismic Hazard Information - NEI 12-06, Appendix H, Revision 2, H.4.2 Path 2: GMRS < SSE with High Frequency Exceedances

References:

1. NEI 12-06, Revision 2, Diverse and Flexible Coping Strategies (FLEX) Implementation Guide, December 2015 (ML16005A625)
2. 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, January 22, 2016 (ML15357A163)
3. Exelon Generation Company, LLC Letter to USNRC, Seismic Hazard and Screening Report (Central and Eastern United States (CEUS) Sites), Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated March 31, 2014 (RS-14-072) (ML14090A526)
4. NRC Letter, Screening and Prioritization Results Regarding Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Seismic Hazard Re-evaluations for Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated May 9, 2014 (ML14111A147)
5. Exelon Generation Company, LLC Letter to USNRC, Quad Cities, Units 1 and 2, Interim Evaluation in Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding the Seismic Aspects of Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated June 6, 2014 (RS-14-171) (ML14157A389)

6. Exelon and NRC Presentation Slides for Public Meeting on Seismic Reevaluation (GMRS) dated June 17, 2014 [Exelon Slides - ML14167A053] [NRC Slides - ML14167A320]
7. Exelon Generation Company, LLC Letter to USNRC, Supplemental Information Regarding Seismic Hazard and Screening Report (Central and Eastern United States (CEUS) Sites) - Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated August 21, 2014 (RS-14-236) (ML14234A124)
8. NRC Letter, Final Screening and Prioritization Results for Limerick, Clinton, Salem, Surry, and Quad Cities Regarding Seismic Hazard Reevaluation for Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated October 3, 2014 (ML14258A043)
9. NRC Letter, Final Determination of Licensee Seismic Probabilistic Risk Assessments Under the Request for Information Pursuant to Title 10 of the Code of Federal Regulations 50.54(f) Regarding Recommendation 2.1 "Seismic" of the Near Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated October 27, 2015 (ML15194A015)
10. NRC Letter, Quad Cities Nuclear Power Station, Units 1 and 2 - Staff Assessment of Information Provided Pursuant to Title 10 of the Code of Federal Regulations Part 50, Section 50.54(f), Seismic Hazard Reevaluations for Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated February 10, 2016 (ML15309A493)
11. Exelon Generation Company, LLC Letter to USNRC, High Frequency Supplement to Seismic Hazard Screening Report, Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated February 19, 2016 (RS-16-044) (ML16050A413)
12. NRC Letter, Quad Cities Nuclear Power Station, Units 1 and 2 - Staff Review of High Frequency Confirmation Associated with Reevaluated Seismic Hazard Response to March 12, 2012 50.54(f) Request for Information, dated March 14, 2016 (ML16060A043)
13. NEI Letter, Request for NRC Endorsement of High Frequency Program: Application Guidance for Functional Confirmation and Fragility Evaluation (EPRI 3002004396), dated July 30, 2015 (ML15223A100/ML15223A102)
14. NRC Letter, September 17, 2015 to NEI: Endorsement of Electric Power Research Institute Final Draft Report 3002004396: "High Frequency Program: Application Guidance for Functional Confirmation and Fragility" (ML15218A569)

The purpose of this letter is to provide the results of the assessment for Quad Cities Nuclear Power Station (QCNPS), Units 1 and 2 to determine if the FLEX strategies developed, implemented and maintained in accordance with NRC Order EA-12-049 can be implemented considering the impacts of the reevaluated seismic hazard. The assessment was performed in accordance with the guidance provided in Appendix H of NEI 12-06 Revision 2 (Reference 1) which was endorsed by the NRC (Reference 2).

The Mitigating Strategies Seismic Hazard Information (MSSHI) is the licensee's reevaluated seismic hazard information at the QCNPS, Units 1 and 2 site, developed using Probabilistic Seismic Hazard Analysis (PSHA). The MSSHI includes a performance-based Ground Motion Response Spectrum (GMRS), Uniform Hazard Response Spectra (UHRS) at various annual probabilities of exceedance, and a family of seismic hazard curves at various frequencies and fractiles developed at the QCNPS, Units 1 and 2 site control point elevation. Exelon Generation Company, LLC (EGC) submitted the reevaluated seismic hazard information including the UHRS, GMRS and the hazard curves to the NRC in Reference 3 which concluded that the QCNPS, Units 1 and 2 site GMRS is bounded by (or with negligible GMRS exceedance) the Safe Shutdown Earthquake (SSE) spectrum at frequencies between 1 to 10 Hz and above 10 Hz. Subsequently, the NRC's Screening and Prioritization letter (Reference 4) conditionally required QCNPS to perform a Seismic Probabilistic Risk Assessment (SPRA), an Expedited Seismic Evaluation Process (ESEP) evaluation and a Spent Fuel Pool (SFP) and a High Frequency (HF) Confirmation evaluation. EGC submitted supplemental information in References 5, 6 and 7 in support of an SPRA / ESEP / SFP / HF "screen-out", and as a result the NRC in Reference 8 retracted the requirement for QCNPS to perform SPRA, ESEP, SFP and HF evaluations. Additionally, Reference 8 indicated that the QCNPS SSE bounds the GMRS and screens out from further Near-Term Task Force (NTTF) Recommendation 2.1 seismic evaluations.

The NRC Final Determination Letter (Reference 9) reaffirmed the Reference 8 evaluation requirements for QCNPS, with exception of the SFP evaluation which was inadvertently shown as required. Reference 9 also confirmed the acceptability of the Reference 3 seismic hazard for use with all NTTF Recommendation 2.1 seismic evaluations for QCNPS based on the adequacy of its characterization of the reevaluated seismic hazard for QCNPS.

The NRC Seismic Hazard Staff Assessment (Reference 10) revoked the inadvertent requirement for a SFP evaluation; however, a new requirement for an HF Confirmation evaluation was added. Additionally, Reference 10 confirmed the acceptability of the Reference 3 seismic hazard for use with all NTTF Recommendation 2.1 seismic evaluations. In response, EGC submitted a NTTF Recommendation 2.1 seismic HF Confirmation evaluation (Reference 11) in accordance with the screening allowance of EPRI 3002004396, Section 3.1.2 for limited HF exceedance (Reference 13, endorsed by NRC in Reference 14). The NRC subsequently accepted the closure of QCNPS HF Confirmation per Reference 12.

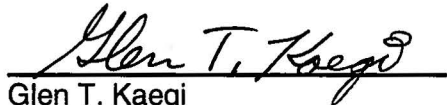
Consistent with Section H.4.2 of Reference 1, the QCNPS, Units 1 and 2 site GMRS is bounded by the Safe Shutdown Earthquake (SSE) spectrum at frequencies between 1 to 10 Hz. In the frequency range above 10 Hz, the GMRS exceeds the SSE spectrum. References 11 and 12 provide the HF Confirmation assessment that was performed for QCNPS, Units 1 and 2 and NRC concurrence, respectively. For the QCNPS, Units 1 and 2 site, the GMRS to SSE exceedance at frequencies greater than 10 Hz qualifies as a minimal high frequency exceedance as defined in Section 3.1.2 of EPRI 3002004396 (Reference 13), as endorsed by the NRC (Reference 14), and is considered inconsequential based on the requirements contained in Section H.4.2 of Reference 1. Therefore, the FLEX strategies for QCNPS, Units 1 and 2 can be implemented as designed and no further seismic evaluations or mitigating strategies assessments are necessary.

This letter contains no new regulatory commitments and no revision to existing regulatory commitments.

If you have any questions regarding this submittal, please contact David P. Helker at (610) 765-5525.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 26th day of May 2016.

Respectfully submitted,

A handwritten signature in cursive script, reading "Glen T. Kaegi", is written over a horizontal line.

Glen T. Kaegi
Director - Licensing & Regulatory Affairs
Exelon Generation Company, LLC

cc: NRC Regional Administrator - Region III
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