



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

January 30, 2017

Mr. Peter P. Sena, III  
President and Chief  
Nuclear Officer  
PSEG Nuclear LLC-N09  
P.O. Box 236  
Hancocks Bridge, NJ 08038

SUBJECT: HOPE CREEK GENERATING STATION – 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. Sena:

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 December 12, 2016, letter (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16348A305), submitted by PSEG Nuclear LLC (PSEG, the licensee) for Hope Creek Generating Station (Hope Creek). The mitigation strategies assessment confirms that the licensee has adequately addressed the reevaluated seismic hazard within its mitigating 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 28, 2014 (ADAMS Accession No. ML14087A436), the licensee provided its reevaluated seismic hazard for Hope Creek 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 February 29, 2016 (ADAMS Accession No. ML16049A609), the NRC staff documented its review of the licensee's reevaluated seismic hazard, also referred to as the mitigating strategies seismic hazard information. The staff confirmed the licensee's conclusion that its reevaluated seismic hazard is bounded by the safe shutdown earthquake (SSE) in the frequency ranges of 1 to 30 Hertz (Hz) and 40 to 100 Hz, but exceeds the SSE between 30 and 40 Hz, meriting a high frequency confirmation. In addition, the staff concluded that the Ground Motion Response Spectrum (GMRS) determined by the licensee adequately characterizes the reevaluated seismic hazard for the Hope Creek site.

By letter dated December 23, 2015 (ADAMS Accession No. ML15358A138), PSEG submitted a High Frequency Confirmation Report for Hope Creek. By letter dated February 18, 2016 (ADAMS Accession No. ML15364A544), the NRC staff confirmed the Hope Creek GMRS exceedance above the current design-basis is on the order of 10 percent or less of the area under the SSE curve over the frequency range of exceedance and met the criterion described in Section 3.1.2, "Limited High Frequency Exceedance Screening," in Electric Power Research Institute (EPRI) Report 3002004396. The EPRI report concluded, and the staff agreed, that these types of minor exceedances over limited frequency ranges do not represent a significant high frequency concern. Therefore, the methodology used by the licensee is appropriate to disposition the GMRS exceedance above the current design-basis.

The licensee stated that the Hope Creek 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 Hope Creek 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 NRC staff has reviewed the seismic hazard MSA for Hope Creek. 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.

P. Sena

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

Sincerely,

A handwritten signature in black ink, appearing to read 'S. Wyman', with a long horizontal flourish extending to the right.

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

Docket No. 50-354

cc: Distribution via Listserv

HOPE CREEK GENERATING STATION – 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 DATED JANUARY 30, 2017

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