



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

May 4, 2015

Mr. Oscar A. Limpias
Vice President-Nuclear and CNO
Nebraska Public Power District
Cooper Nuclear Station
72676 648A Avenue
P.O. Box 98
Brownville, NE 68321

SUBJECT: COOPER NUCLEAR STATION - REQUEST FOR ADDITIONAL INFORMATION
ASSOCIATED WITH NEAR-TERM TASK FORCE RECOMMENDATION 2.1,
SEISMIC HAZARD AND SCREENING REPORT

Dear Mr. Limpias:

By letter dated March 31, 2014, to the Nuclear Regulatory Commission (NRC) (Agencywide Documents and Management System (ADAMS) Accession No. ML14094A040), Nebraska Public Power District (the licensee), submitted for NRC review its Seismic Hazard and Screening Report, Response to NRC Request for Information Pursuant to Title 10 of the *Code of Federal Regulations* 10 Part 50, Section 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident for Cooper Nuclear Station (CNS). By letter dated February 11, 2015 (ADAMS Accession No. ML15050A165) the licensee revised its March 31, 2014, submittal.

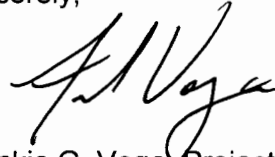
The NRC staff has reviewed the March 31, 2014, submittal and documented its final screening decision by letter dated October 28, 2014 (ADAMS Accession No. ML14273A259). The NRC staff has reviewed the updated information provided in the February 11, 2015, revised submittal, and has determined that additional information is required to complete the review. Enclosed are requests for additional information (RAIs) related to the plant's Individual Plant Examination for External Events. As discussed with your staff during a recent phone call, the NRC staff requests that you respond no later than June 23, 2015.

O. Limpias

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If you have any questions related to the enclosed RAIs or the requested submission date, please contact me at 301-415-1617 or via e-mail at Frankie.Vega@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read 'Frankie Vega', with a stylized, cursive script.

Frankie G. Vega, Project Manager
Hazards Management Branch
Japan Lessons-Learned Division
Office of Nuclear Reactor Regulation

Docket No. 50-298

Enclosure:
Request for Additional Information

cc w/encl: Distribution via Listserv

REQUEST FOR ADDITIONAL INFORMATION
NEAR-TERM TASK FORCE RECOMMENDATION 2.1,
SEISMIC HAZARD AND SCREENING REPORT
NEBRASKA PUBLIC POWER DISTRICT
COOPER NUCLEAR STATION
DOCKET NO. 50-298

On March 12, 2012, the U.S. Nuclear Regulatory Commission (NRC) issued a request for information pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.54(f) (hereafter referred to as the 50.54 (f) letter) (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12053A340). The purpose of the request was to gather information concerning, in part, the seismic hazards at operating reactor sites and to enable the NRC staff to determine whether licenses should be modified, suspended, or revoked. To respond to the 50.54(f) letter, Nebraska Public Power District (NPPD, the licensee) committed to follow the Electric Power Research Institute (EPRI) Report, "Seismic Evaluation Guidance: Screening, Prioritization and Implementation Details (SPID) for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic," (ADAMS Accession No. ML12333A170), as supplemented, by the EPRI Report, "Seismic Evaluation Guidance: Augmented Approach for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic" (referred to as the Expedited Approach) (ADAMS Accession No. ML13102A142). By Letter dated March 31, 2014, NPPD submitted the re-evaluated seismic hazards (ADAMS Accession No. ML14094A040) for Cooper Nuclear Station (CNS). The NRC staff conducted the screening and prioritization review of the submittal by assessing NPPD's screening evaluation and hazard analysis utilizing the endorsed SPID guidance. Accordingly, during the NRC screening and prioritization process, the staff identified that a determination could not be made and interactions with the licensee were needed to reach resolution. The staff identified CNS, as a "conditional screen-in" for the purposes of prioritizing and conducting additional evaluations. By letter dated October 28, 2014, the NRC staff issued its Final Screening and Results for CNS (ADAMS Accession No. ML14273A259) documenting the NRC staff's screening results. The staff determined that CNS screened-in to conduct a seismic risk evaluation (Prioritization Group 3). By letter dated February 11, 2015, NPPD submitted a revised seismic hazard report (ADAMS Accession No. ML15050A165) for CNS.

In accordance with the SPID and Expedited Approach guidance, the re-evaluated seismic hazard determines if additional seismic risk evaluations are warranted for a plant. The SPID guidance provides criteria for a plant with ground motion response spectra (GMRS) above the safe shutdown earthquake, but bounded by the Individual Plant Examination for External Events (IPEEE) capacity spectrum. To use the IPEEE capacity spectrum to screen out of conducting a seismic risk evaluation, the licensee needed to demonstrate the adequacy of CNS's IPEEE evaluation by meeting the criteria in the SPID. If the IPEEE capacity is greater than the GMRS

Enclosure

in the 1-10 Hertz (Hz) range and demonstrates that it meets the SPID screening criteria, the plant screens out of conducting a seismic risk.

The following additional information is requested to support the NRC's final screening determination for CNS based on IPEEE adequacy:

After reviewing IPEEE Adequacy Evaluation and IPEEE High Confidence of a Low Probability of Failure (HCLPF) spectra (IHS) Development part of the Seismic Hazard and Screening Report and the earlier IPEEE submittal for CNS, the NRC staff has four requests for additional information. The information will be reviewed by the NRC staff as part of the NRC staff evaluation of the IPEEE adequacy to meet the SPID screening criteria and, if needed, to support a follow-on audit of the items addressed in the requests.

- 1) Section 3.2 of the Seismic Hazard and Screening Report (SHSR) states that the control point elevation of 869.5 ft. was used for the comparison of the GMRS, IHS and safe shutdown earthquake. Section B.4.1 of Appendix B of the SHSR, states that the control point of the Review Level Earthquake motion applied in the SHAKE code, as part of the IPEEE adequacy demonstration, was 902 feet. Please describe the impact, if any, this apparent control point discrepancy has in the final screening results.
- 2) Section C.2.2 of Appendix C of the SHSR discusses the enhanced liquefaction assessment performed for CNS. The analyses performed by the licensee show factors of safety against liquefaction generally on the order of 1.4 or greater over a significant portion of the structural fill profile (Figures C.2-1 and C.2-2). Although significant loss of shear strength is not expected when the factor of safety is 1.4 or greater, some seismic induced settlement is anticipated. Please specify how much seismic induced settlement/differential settlement is expected and what implications does this amount of settlement have on the success of the safe shutdown path?
- 3) Section C.2.3 of Appendix C of the SHSR discusses the enhanced liquefaction assessment for the native alluvium underlying the Radwaste Building. The CNS SHSR states that the factor of safety against liquefaction is typically less than 1.0 in the native alluvium below the Radwaste Building. Liquefaction may cause significant strength loss leading to bearing capacity failure and large differential settlements resulting in significant structural damage to this building and its foundation. In addition, the licensee states that in the event of liquefaction, the Radwaste building will rotate away from the Control and Reactor buildings. Please provide the following:
 - a. Additional information supporting the licensee's conclusion that the Radwaste Building can only undergo rotation away from the Control and Reactor buildings. The information should include details about the estimated seismically induced differential settlement, the structural foundation, and the structure itself that supports the aforementioned conclusion.
 - b. In the case of a liquefaction event that results in the complete overturn or collapse of the Radwaste building, please provide reassurance that a total loss of this building doesn't affect the licensee's coping capabilities.

- 4) As part of the IPEEE screening process described in the SPID, licensees are required to provide background information in order to demonstrate the adequacy of the results. Specifically, licensees are required to "Confirm that any identified deficiencies or weaknesses to NUREG-1407 in the plant specific NRC Safety Evaluation Report (SER) are properly justified to ensure that the IPEEE conclusions remain valid." According to the IPEEE SER, the staff noted that only low pressure injection systems were selected for success paths and included as part of the safe shutdown equipment list (SSEL) process. As such, high pressure injection systems, including Reactor Core Isolation Cooling and High Pressure Coolant Injection were not included as part of the success path evaluation and the SSEL selection process. The NRC SER states that not including a high pressure injection system differs from paths suggested in EPRI NP-6041, and other previous IPEEE submittals, as a "first line of defense" that responds automatically. The exclusion makes the demand on low pressure systems more significant, which in turn, makes the demand on operator actions more significant since the automatic initiation circuitry for depressurization and initiation of the low pressure systems was also not included in the SSEL. The staff has determined that the following information was not provided and is needed to demonstrate the accuracy of the IPEEE results
- a. Explanation on how the reliance on operator/manual actions were taken into account in the analysis to ensure an operator error could not fail a success path.
 - b. Justification of the completeness and diversity of the SSEL list.

O. Limpias

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If you have any questions related to the enclosed RAIs or the requested submission date, please contact me at 301-415-1617 or via e-mail at Frankie.Vega@nrc.gov.

Sincerely,

/RA/

Frankie G. Vega, Project Manager
Hazards Management Branch
Japan Lessons-Learned Division
Office of Nuclear Reactor Regulation

Docket No. 50-298

Enclosure:
Request for Additional Information

cc w/encl: Distribution via Listserv

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ADAMS Accession No.: ML15107A254

***concurrence via e-mail**

OFFICE	NRR/JLD/JHMB/PM	NRR/JLD/JHMB/LA	NRO/DSEA/RGS/BC	NRR/JLD/JHMB/BC
NAME	FVega	SLent	DJackson	MShams
DATE	04/30/2015	04/21/2015	05/04/2015	05/04/2015

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