

December 9, 2016
L-16-323

10 CFR 50.54(f)

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

SUBJECT:

Davis-Besse Nuclear Power Station
Docket No. 50-346, License No. NPF-3
Spent Fuel Pool Evaluation Supplemental Report, Response to NRC Request for
Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-
Term Task Force (NTTF) Review of Insights from the Fukushima Dai-ichi Accident
(CAC Nos. MF3728 and MF5238)

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued a Request for Information per 10 CFR 50.54(f) (Reference 1) to all power reactor licensees. Enclosure 1, Item (9) of the 50.54(f) letter requested addressees to provide limited scope spent fuel pool (SFP) evaluations. By letter dated October 27, 2015 (Reference 2), the NRC transmitted final seismic information request tables, which identified that FirstEnergy Nuclear Operating Company (FENOC) is to conduct a limited scope SFP evaluation for Davis-Besse Nuclear Power Station (DBNPS). By Reference 3, Nuclear Energy Institute (NEI) submitted an Electric Power Research Institute (EPRI) report entitled, *Seismic Evaluation Guidance Spent Fuel Pool Integrity Evaluation (EPRI 3002007148)* (Reference 4), for NRC review and endorsement. NRC endorsement was provided by Reference 5.

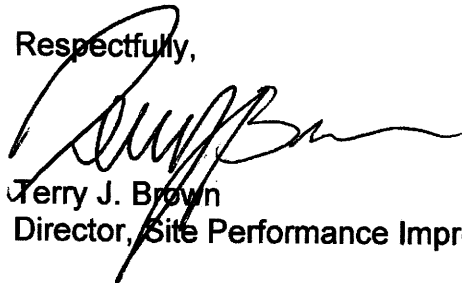
EPRI 3002007148 provides criteria for evaluating the seismic adequacy of a SFP to the reevaluated ground motion response spectrum (GMRS) hazard levels. This report supplements the guidance in the *Seismic Evaluation Guidance, Screening, Prioritization and Implementation Details (SPID) for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic* (Reference 8) report for plants where the GMRS peak spectral acceleration is less than or equal to 0.8g. Section 3.3 of EPRI 3002007148 lists the parameters to be verified to confirm that the results of the report are applicable to DBNPS, and that the DBNPS SFP is seismically adequate in accordance with NTTF 2.1 Seismic evaluation criteria.

The attachment to this letter provides the data for DBNPS that confirms applicability of the EPRI 3002007148 criteria, confirms that the SFP is seismically adequate, and provides the requested information in response to Item (9) of the 50.54(f) letter associated with NTTF Recommendation 2.1 Seismic evaluation criteria.

There are no new regulatory commitments contained in this letter and no revisions to existing regulatory commitments. If there are any questions or if additional information is required, please contact Mr. Thomas A. Lentz, Manager – Fleet Licensing, at 330-315-6810.

I declare under penalty of perjury that the foregoing is true and correct. Executed on December 9, 2016.

Respectfully,



Terry J. Brown
Director, Site Performance Improvement

Attachment

Site-Specific Spent Fuel Pool Criteria for Davis-Besse Nuclear Power Station

References:

1. NRC Letter, Request for Information Pursuant to Title 10 of the *Code of Federal Regulations* 50.54(f) Regarding Recommendations 2.1, 2.3, and 9.3, of the Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident, dated March 12, 2012, Agencywide Documents Access and Management System (ADAMS) Accession Number ML12053A340.
2. 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, ADAMS Accession Number ML15194A015.
3. NEI Letter, Request for Endorsement of *Seismic Evaluation Guidance: Spent Fuel Pool Integrity Evaluation (EPRI 3002007148)*, dated February 23, 2016, ADAMS Accession Number ML16055A017.
4. EPRI Report 3002007148, *Seismic Evaluation Guidance Spent Fuel Pool Integrity Evaluation*, February 2016, ADAMS Accession Number ML16055A021.

5. NRC Letter, Endorsement of Electric Power Research Institute Report 3002007148, "Seismic Evaluation Guidance: Spent Fuel Pool Integrity Evaluation," dated March 17, 2016, ADAMS Accession Number ML15350A158.
6. FENOC Letter, FirstEnergy Nuclear Operating Company (FENOC) Seismic Hazard and Screening Report (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 (NTTF) Review of Insights from the Fukushima Dai-ichi Accident, dated March 31, 2014, ADAMS Accession Number ML14092A203.
7. NRC Letter, Davis-Besse Nuclear Power Station, Unit 1 - 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 (TAC No. MF3728), dated August 25, 2015, ADAMS Accession Number ML15230A289.
8. EPRI Report 1025287, *Seismic Evaluation Guidance, Screening, Prioritization and Implementation Details [SPID] for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic*, November 2012, ADAMS Accession Number ML12333A170.
9. FENOC Letter, FirstEnergy Nuclear Operating Company (FENOC) Expedited Seismic Evaluation Process (ESEP) Reports, Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force (NTTF) Review of Insights from the Fukushima Dai-ichi Accident, dated December 19, 2014, ADAMS Accession Number ML14353A059.
10. NRC Letter, Davis-Besse Nuclear Power Station, Unit 1 - Staff Review of Interim Evaluation Associated with Reevaluated Seismic Hazard Implementing Near-Term Task Force Recommendation 2.1 (TAC No. MF5238), dated October 19, 2015, ADAMS Accession Number ML15273A237.

cc: Director, Office of Nuclear Reactor Regulation (NRR)
NRC Region III Administrator
NRC Resident Inspector
NRR Project Manager
Utility Radiological Safety Board

ATTACHMENT

FirstEnergy Nuclear Operating Company

Davis-Besse Nuclear Power Station

Docket No. 50-346

License No. NPF-3

**Site-Specific Spent Fuel Pool Criteria for Davis-Besse Nuclear
Power Station**

The 50.54(f) letter (Reference 1) requested that, in conjunction with the response to NTTF Recommendation 2.1, a seismic evaluation be made of the SFP. More specifically, plants were asked to consider "all seismically induced failures that can lead to draining of the SFP." Such an evaluation would be needed for any plant in which the ground motion response spectrum (GMRS) exceeds the safe shutdown earthquake (SSE) in the 1 to 10 Hz frequency range. The staff confirmed through References 2 and 7 that the GMRS exceeds the SSE and concluded that a SFP evaluation is merited for the FirstEnergy Nuclear Operating Company (FENOC, the licensee) Davis-Besse Nuclear Power Station (DBNPS). By letter dated March 17, 2016 (Reference 5), the staff determined that EPRI 3002007148 was an acceptable approach for performing SFP evaluations for plants where the peak spectral acceleration is less than or equal to 0.8g.

The table below lists the criteria from Section 3.3 of EPRI 3002007148 along with data for DBNPS that confirms applicability of the EPRI 3002007148 criteria and confirms that the SFP is seismically adequate and can retain adequate water inventory for 72 hours in accordance with NTTF 2.1 Seismic evaluation criteria.

SFP Criteria from EPRI 3002007148	Site-Specific Data
Site Parameters	
1. The site-specific GMRS peak spectral acceleration at any frequency should be less than or equal to 0.8g.	The GMRS peak spectral acceleration in NTTF 2.1 Seismic Hazard and Screening Report Davis-Besse Nuclear Power Station Ottawa County, Ohio (Reference 6), as accepted by the NRC in Davis-Besse Nuclear Power Station, Unit 1 - Staff Assessment of Information Provided Pursuant to Title 10 of the <i>Code of Federal Regulations</i> 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 (TAC No. MF3728) (Reference 7), has been superseded by the FirstEnergy Nuclear Operating Company (FENOC) Expedited Seismic Evaluation Process (ESEP) Reports, Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force (NTTF) Review of Insights from the Fukushima Dai-ichi Accident (Reference 9), as accepted by the NRC in letter Davis-Besse Nuclear Power Station, Unit 1 - Staff Review of Interim Evaluation Associated with Reevaluated Seismic Hazard Implementing Near-Term Task Force Recommendation 2.1 (Reference 10), is 0.54g, which is $\leq 0.8g$; therefore, this criterion is met.
Structural Parameters	
2. The structure housing the SFP should be designed using an SSE with a peak ground acceleration (PGA) of at least 0.1g.	The SFP is housed in the auxiliary building, which is seismically designed to the site SSE with a PGA of 0.15g per USAR Section 3.2.1. The DBNPS PGA is greater than 0.1g; therefore, this criterion is met.

SFP Criteria from EPRI 3002007148	Site-Specific Data
<p>3. The structural load path to the SFP should consist of some combination of reinforced concrete shear wall elements, reinforced concrete frame elements, post-tensioned concrete elements and/or structural steel frame elements.</p>	<p>The SFP is housed in Auxiliary Building, Area 8, which is constructed of steel framing, reinforced concrete (RC) walls, roofs and floors [Ref. Drawings C-202 and C-230]. The exterior walls of the SFP are 5 ft. 6 in. thick RC walls. The SFP floor is a 5 ft. thick RC slab. The structural load path from the SFP to the foundation consists of 5 ft 6 in. thick RC walls at the boundary of the pool and also by several 2 ft. to 3 ft. thick intermediate bearing walls of 13 ft. 6 in. height. The foundation mat is a 3 ft. thick RC slab that bears on bedrock. Therefore, this criterion is met for DBNPS.</p>
<p>4. The SFP structure should be included in the Civil Inspection Program performed in accordance with Maintenance Rule.</p>	<p>The SFP structure is included in the DBNPS Structures Monitoring Program in accordance with 10 CFR 50.65, which monitors the performance or condition of structures, systems, or components (SSCs) in a manner sufficient to provide reasonable assurance that these SSCs are capable of fulfilling their intended functions [Ref. Procedure EN-DP-01511]. Therefore, this criterion is met for DBNPS.</p>
Non-Structural Parameters	
<p>5. To confirm applicability of the piping evaluation in Section 3.2 of EPRI 3002007148, piping attached to the SFP up to the first valve should have been evaluated for the SSE.</p>	<p>All piping attached to the SFP is seismically qualified to SSE in accordance with USAR Section 9.1.3.11, except five small bore lines and an overfill line. These lines are located approximately 20 ft. above the top of active fuel and provide approximately 147 hours before uncovering the spent fuel and approximately 178 hours before the top 1/3 of the spent fuel pool is uncovered per ABS Consulting calculation 2734296-C-134, Revision 0.</p> <p>Section 3.2 of EPRI 3002007148 is focused on the rapid draining of the SFP such that there is an uncovering of more than 1/3 of the spent fuel height within 72 hours. With greater than 72 hours available, there is no concern of rapid drain down; therefore, the intent of this criterion is met for DBNPS.</p>

SFP Criteria from EPRI 3002007148	Site-Specific Data
<p>6. Anti-siphoning devices should be installed on any piping that could lead to siphoning water from the SFP. In addition, for any cases where active anti-siphoning devices are attached to 2-inch or smaller piping and have extremely large extended operators, the valves should be walked down to confirm adequate lateral support.</p>	<p>No anti-siphoning devices are used. Piping design is such that it is not possible to siphon the spent fuel pool water level down as the result of a failed pipe or component to a water level below 9 ft. 6 in. above the top of the spent fuel rack [Ref. USAR Section 9.1.2.3]. This level provides adequate shielding and cooling of the spent fuel system. Since the piping of the SFP cooling system cannot lead to rapid drain down due to siphoning; this criterion is met for DBNPS.</p> <p>As described, no anti-siphoning devices are attached to 2-in. or smaller piping with extremely large extended operators; therefore, this criterion is satisfied for DBNPS.</p>
<p>7. To confirm applicability of the sloshing evaluation in Section 3.2 of EPRI 3002007148, the maximum SFP horizontal dimension (length or width) should be less than 125 ft., the SFP depth should be greater than 36 ft, and the GMRS peak S_a should be $<0.1g$ at frequencies equal to or less than 0.3 Hz.</p>	<p>The DBNPS SFP is part of multiple interconnected pools, along with the fuel transfer pool and the cask pit. Combined, these pools have a length of less than 20 ft., a width less than 53 ft., and a depth of 39 ft. 6 in. based on drawing C-0247; therefore, this criterion is met.</p> <p>The DBNPS GMRS maximum spectral acceleration in the frequency range less than 0.3 Hz is 0.02g from the FirstEnergy Nuclear Operating Company (FENOC) Expedited Seismic Evaluation Process (ESEP) Reports, Response to NRC Request for Information pursuant to 10 CFR 50.54(f) Regarding Recommendation 2.1 of the Near-Term Task Force (NTTF) Review of Insights from the Fukushima Dai-ichi Accident (Reference 9), which is less than 0.1g; therefore, this criterion is met.</p>
<p>8. To confirm applicability of the evaporation loss evaluation in Section 3.2 of EPRI 3002007148, the SFP surface area should be greater than 500 ft² and the licensed reactor core thermal power should be less than 4,000 MWt per unit.</p>	<p>The surface area of the DBNPS SFP proper is 1,056.96 ft² based on drawing C-0247 and USAR Section 9.1.3.3, which is greater than 500 ft²; and licensed reactor thermal power for DBNPS is 2,817 MWt [Ref. USAR Section 1] per unit, which is less than 4,000 MWt per unit; therefore, these criteria are met.</p>