

JUN 30 2016

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

10 CFR 50.4
10 CFR 50.54(f)

**SUSQUEHANNA STEAM ELECTRIC STATION (SSES)
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 REVIEW OF INSIGHTS FROM THE
DAI-ICHI ACCIDENT
PLA-7491**

**Docket No. 50-387
and No. 50-388**

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 (ADAMS Accession Number ML12053A340).*
2. *EPRI 1025287, Seismic Evaluation Guidance, Screening, Prioritization and Implementation Details [SPID] for the Resolution of Fukushima Near-Term Task Force Recommendation 2.1: Seismic, February 2013.*
3. *SSES Letter PLA-7145, 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 Review of Insights from the Fukushima Dai-ichi Accident, dated March 26, 2014 (ADAMS Accession Number ML14085A398).*
4. *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).*
5. *NRC Letter, SESS 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 (CAC nos. MF3707 and MF3708), dated Jan 20, 2016 (ADAMS Accession Number ML15356A247).*
6. *NEI Letter, transmits EPRI 3002007148 for NRC endorsement, dated February 23, 2016 (ADAMS Accession Number ML16055A017).*
7. *EPRI 3002007148, Seismic Evaluation Guidance Spent Fuel Pool Integrity Evaluation, February 2016.*
8. *NRC Letter, provides endorsement of EPRI 3002007148, dated March 17, 2016 (ADAMS Accession Number ML15350A158).*

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 4), the NRC transmitted final seismic information request tables which identified that Susquehanna Nuclear, LLC is to conduct a limited scope SFP Evaluation. By Reference 6, Nuclear Energy Institute (NEI) submitted an Electric Power Research Institute (EPRI) report entitled, Seismic Evaluation Guidance Spent Fuel Pool Integrity Evaluation (EPRI 3002007148) (Reference 7) for NRC review and endorsement. NRC endorsement was provided by Reference 8.

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) (Reference 2), 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 Susquehanna Steam Electric Station (SSES), and that the SSES Unit 1 and 2 SFPs are seismically adequate in accordance with near term task force (NTTF) 2.1 Seismic evaluation criteria.

The attachment to this letter provides the data for SSES Units 1 and 2 that confirms applicability of the EPRI 3002007148 criteria, confirms that the SFPs are seismically adequate, and provides the requested information in response to Enclosure 1, Item (9) of the 50.54 (f) letter associated with NTTF Recommendation 2.1 Seismic evaluation criteria.

This letter contains no new Regulatory Commitments and no revision to existing Regulatory Commitments.

Should you have any questions regarding this submittal, please contact Mr. Jason Jennings, Manager- Nuclear Regulatory Affairs at (570) 542-3155.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on: 6/30/2016

Sincerely,



T.S. Rausch

Attachment: Site-Specific Spent Fuel Pool Criteria for SSES Units 1 and 2

Copy: NRC Region I

Mr. J. E. Greives, NRC Sr. Resident Inspector

Ms. T. E. Hood, NRC Project Manager

Mr. J. D. Hughey, NRC Project Manager

Mr. M. Shields, PA DEP/BRP

Attachment to PLA-7491

**Site-Specific Spent Fuel Pool Criteria for
SSES Units 1 and 2**

Title: Site-Specific Spent Fuel Pool Criteria for SSES Units 1 and 2

The 50.54(f) letter requested that, in conjunction with the response to NTF 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 4 and 5 that the GMRS exceeds the SSE and concluded that a SFP evaluation is merited for SSES Units 1 and 2. By letter dated March 17, 2016 (Reference 8) 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 SSES Units 1 and 2 that confirms applicability of the EPRI 3002007148 criteria and confirms that the SFPs are seismically adequate and can retain adequate water inventory for 72 hours in accordance with NTF 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 for SSES Units 1 and 2 in Reference 3 as accepted by the NRC in Reference 5 is 0.256g, which is $\leq 0.8g$. Therefore, this criterion is met for SSES Units 1 and 2.
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 SFPs are housed in the Reactor Buildings, which are seismically designed to the site SSE with a PGA of 0.10g which is equal to the 0.1g criterion. Therefore, this criterion is met for SSES Units 1 and 2.
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.	SSES Units 1 and 2 SFPs are located in the Reactor Buildings with the top of the SFPs at the Refueling Floor approximately 148 ft above grade. The main SFP walls (north-south) are reinforced concrete girders that span between Reactor Buildings reinforced concrete shear walls (east-west) which provide the primary load path to the Reactor Building reinforced concrete foundation mats on bedrock. Therefore, this criterion is met for SSES Units 1 and 2.

SFP Criteria from EPRI 3002007148	Site-Specific Data
<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 SSES Units 1 and 2 Structural 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. Therefore, this criterion is met for SSES Units 1 and 2.</p>
<p>Non-Structural Parameters</p>	
<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>Piping attached to the SSES Units 1 and 2 SFPs has been evaluated for the SSE. Therefore, this criterion is met for SSES Units 1 and 2.</p>
<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>Two cooling water supply pipes and two residual heat removal cooling return pipes enter the SSES Units 1 and 2 SFPs from above the normal water level. Each pipe is provided with a high point siphon breaking vent to prevent siphoning of water from the SFPs. As described, anti-siphoning devices are installed on all SFP piping that could lead to siphoning the SFPs. No active anti-siphoning devices are provided. Therefore, this criterion is met for SSES Units 1 and 2.</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 Sa should be < 0.1g at frequencies equal to or less than 0.3 Hz.</p>	<p>The SSES Units 1 and 2 SFPs each have a length of 30 ft (< 125'), a width of 45 ft (< 125') and a depth of 39 ft 1 inch (> 36'). The GMRS maximum spectral acceleration in the frequency range equal to or less than 0.3 Hz for SSES Units 1 and 2 in Reference 3 as accepted by the NRC in Reference 5 is 0.014 g which is < 0.1g. Therefore, this criterion is met for SSES Units 1 and 2.</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 SSES Units 1 and 2 is 1350 ft² for each SFP which is greater than 500 ft²; and the licensed reactor thermal power for SSES Units 1 and 2 is 3952 MWt per unit which is less than 4,000 MWt per unit. Therefore, this criterion is met for SSES Units 1 and 2.</p>

References:

The following references support the information provided in this attachment.

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 (ADAMS Accession Number ML12053A340).
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