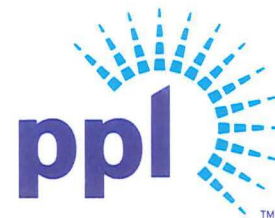


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SEP 12 2013

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

**SUSQUEHANNA STEAM ELECTRIC STATION
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 – 1.5 YEAR RESPONSE FOR CEUS SITES
PLA-7077**

**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*
2. *NRC Letter, Endorsement of EPRI Final Draft Report 1025287, "Seismic Evaluation Guidance," dated February 15, 2013*
3. *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*
4. *NEI Letter to NRC, Proposed Path Forward for NTTF Recommendation 2.1: Seismic Reevaluations, dated April 9, 2013*
5. *NRC Letter, EPRI Final Report 3002000704, "Seismic Evaluation Guidance: Augmented Approach for the Resolution of Near-Term Task Force Recommendation 2.1: Seismic," as an Acceptable Alternative to the March 12, 2012, Information Request for Seismic Reevaluations, dated May 7, 2013*

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued Reference 1 to all power reactor licensees and holders of construction permits in active or deferred status. Enclosure 1 of Reference 1 requested each addressee in the Central and Eastern United States (CEUS) to submit a written response consistent with the requested seismic hazard evaluation information (items 1 through 7) by September 12, 2013. On February 15, 2013, NRC issued Reference 2, endorsing the Reference 3 industry

guidance for responding to Reference 1. Section 4 of Reference 3 identifies the detailed information to be included in the seismic hazard evaluation submittals.

On April 9, 2013, NEI submitted Reference 4 to NRC, requesting NRC agreement to delay submittal of some of the CEUS seismic hazard evaluation information so that an update to the EPRI (2004, 2006) ground motion attenuation model could be completed and used to develop that information. NEI proposed that descriptions of subsurface materials and properties and base case velocity profiles (items 3a and 3b in Section 4 of Reference 3) be submitted to NRC by September 12, 2013, with the remaining seismic hazard and screening information submitted to NRC by March 31, 2014. In Reference 5, NRC agreed with this recommendation.

The attachments to this letter contain the requested descriptions of subsurface materials and properties and base case velocity profiles for Susquehanna SES Units 1 and 2. The information provided in the attachments to this letter is considered an interim product of seismic hazard development efforts being performed for the industry by EPRI. The complete and final seismic hazard reports for PPL Susquehanna, LLC will be provided to the NRC in our seismic hazard submittals by March 31, 2014 in accordance with Reference 5.


This letter contains no new regulatory commitments.

If you have any questions regarding this report, please contact Mr. John L. Tripoli at 570-542-3100.

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

Executed on: 9/12/2013

Sincerely,



J. A. Franke

Enclosure: PPL Susquehanna, LLC's descriptions of subsurface materials and properties and base case velocity profiles (items 3a and 3b in Section 4 of EPRI Report 1025287)

Copy: NRC Region I

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

Mr. J. A. Whited, NRC Project Manager

Mr. L. J. Winker, PA DEP/BRP

Enclosure to PLA-7077

**PPL Susquehanna, LLC's descriptions of
subsurface materials and properties and base
case velocity profiles (items 3a and 3b in Section 4
of EPRI Report 1025287)**

PPL Susquehanna, LLC's descriptions of subsurface materials and properties and base case velocity profiles (items 3a and 3b in Section 4 of EPRI Report 1025287)

Susquehanna Steam Electric Station (SSES) Site Description

The basic information used to create the site geologic profile at the Susquehanna Steam Electric Station (SSES) is shown in Table A-1. This profile was developed using information documented in Ref. 1 (Note: All references mentioned herein are listed below). As indicated in Ref. 1, the Safe Shutdown Earthquake (SSE) Control Point can be defined at the base of the reactor foundation, which is at Elevation 640 ft msl; the profile was modeled up to this elevation. The rock at the site is considered as a linear material having dynamic properties that are independent of strain levels. The sound rock of the Mahantango Formation is divided into sub-layers (MF1 through MF5) based on their shear wave velocities as shown in Table A-1. The damping value for MF1 through MF3 is 0.8 percent, and the damping value of MF4 and MF5 is 0.7 percent, per Ref. 6.

The base-case shear wave velocity profile used to model amplification at the site is shown in Figure A-1. Shear wave velocity profiles Profile 1 and Profile 2 are provided as an indication of possible variability at the site. Note that Profile 2 assumes hard rock conditions up to the surface. Thicknesses, depths and shear wave velocities corresponding to each profile are shown in Table A-2.

References

1. FZ Ares, LLC (FZA), "Subsurface Material Properties and Base Case Velocity Profiles," Project No. 13-076, Rev. 0, August 27, 2013, VID No. 1765.
2. NRC, 2007, Regulatory Guide 1.208, A Performance-Based Approach to Define the Site-Specific Earthquake Ground Motion, Nuclear Regulatory Commission, 2007.
3. NRC, 2009, Interim Staff Guidance 17 (DC/COL-ISG-017), Interim Staff Guidance on Ensuring Hazard-Consistent Seismic Input for Site Response and Soil Structure Interaction Analyses, Nuclear Regulatory Commission, 2009
4. PPL, 2011, Susquehanna Steam Electric Station Units 1 & 2 Final Safety Analysis Report (FSAR) Rev. 67, Section 2.5, PPL Susquehanna, LLC.
5. UniStar, 2010, Bell Bend Nuclear Power Project Final Safety Analysis Report Rev. 2, Section 2.5, UniStar Nuclear Services, LLC.
6. UniStar, 2013, Bell Bend Nuclear Power Project Final Safety Analysis Report Rev. 4, Section 2.5, UniStar Nuclear Services, LLC.

PPL Susquehanna, LLC's descriptions of subsurface materials and properties and base case velocity profiles (items 3a and 3b in Section 4 of EPRI Report 1025287)

TABLE A-1, SUMMARY OF GEOTECHNICAL PROFILE DATA FOR SUSQUEHANNA STEAM ELECTRIC STATION

SSES RECOMMENDED	EL. ⁽¹⁾ [ft]	DEPTH ⁽²⁾ [ft]	$\gamma^{(3)}$ [pcf]	$V_p^{(3)}$ [fps]	$V_s^{(3)}$ [fps]	$\nu^{(3)}$
Glacial overburden soils	670.0	0.0	130	1500	700	0.35
Weathered rock	655.0	15.0	130	7600	3600	0.35
Mahantango Formation 1 (MF1)	640.0	30.0	170	16000	7500	0.30
Mahantango Formation 2 (MF2)	540.0	130.0	170	15600	7905	0.32
Mahantango Formation 3 (MF3)	445.8	224.2	170	15705	8415	0.30
Mahantango Formation 4 (MF4)	383.3	286.7	170	15755	9050	0.28
Mahantango Formation 5 (MF5)	248.7	421.3	170	16850	9600	0.26
NOTES: ⁽¹⁾ Site grade elevation is taken as 670 ft. ⁽²⁾ Measured from site grade ⁽³⁾ SSES FSAR data used for depth less than 130 ft; Bell Bend Nuclear Power Plant (BBNPP) interpolated for depth greater than 130 ft						

PPL Susquehanna, LLC's descriptions of subsurface materials and properties and base case velocity profiles (items 3a and 3b in Section 4 of EPRI Report 1025287)

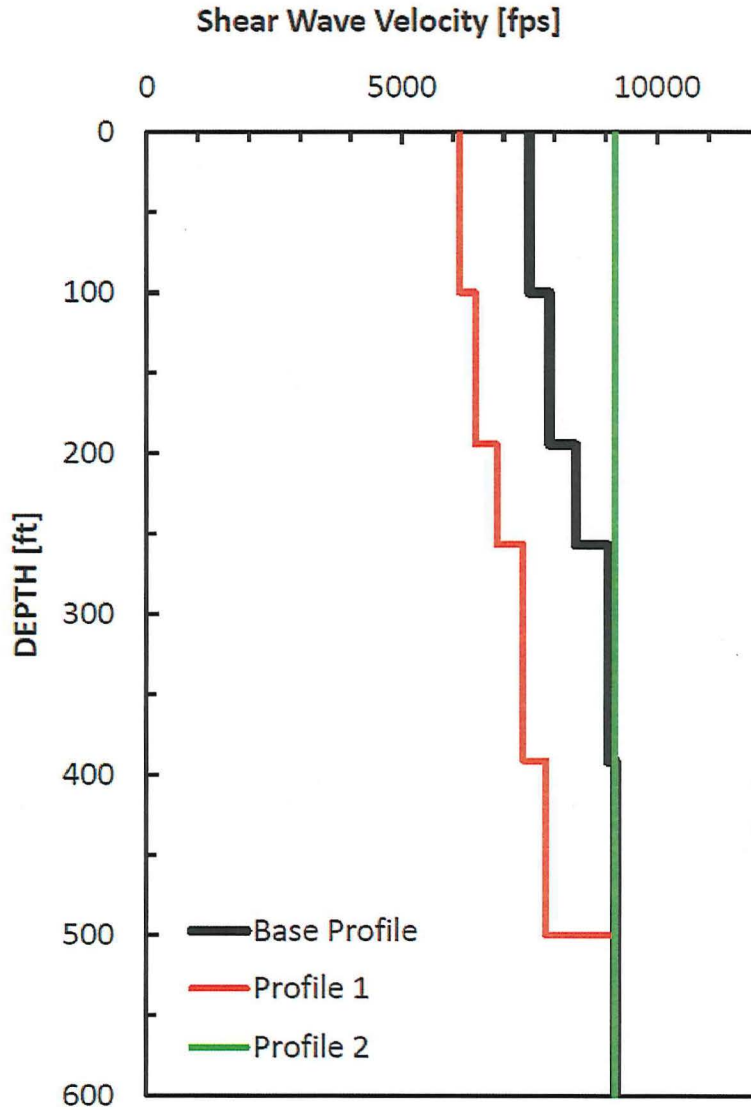


FIGURE A-1, SHEAR WAVE VELOCITY PROFILES OF SUSQUEHANNA STEAM ELECTRIC STATION

PPL Susquehanna, LLC's descriptions of subsurface materials and properties and base case velocity profiles (items 3a and 3b in Section 4 of EPRI Report 1025287)

TABLE A-2, LAYER THICKNESS, DEPTH AND SHEAR WAVE VELOCITY FOR 3 PROFILES, SUSQUEHANNA STEAM ELECTRIC STATION

Profile 1			Base Profile			Profile 2		
Thickness	Depth	Vs	Thickness	Depth	Vs	Thickness	Depth	Vs
[ft]	[ft]	[fps]	[ft]	[ft]	[fps]	[ft]	[ft]	[fps]
-	0	6124	-	0	7500	-	0	9200
12	12	6124	12	12	7500	12	12	9200
12	24	6124	12	24	7500	12	24	9200
12	36	6124	12	36	7500	12	36	9200
12	48	6124	12	48	7500	12	48	9200
12	60	6124	12	60	7500	12	60	9200
12	72	6124	12	72	7500	12	72	9200
12	84	6124	12	84	7500	12	84	9200
12	96	6124	12	96	7500	12	96	9200
4	100	6454	4	100	7905	4	100	9200
12	112	6454	12	112	7905	12	112	9200
12	124	6454	12	124	7905	12	124	9200
12	136	6454	12	136	7905	12	136	9200
12	148	6454	12	148	7905	12	148	9200
12	160	6454	12	160	7905	12	160	9200
12	172	6454	12	172	7905	12	172	9200
12	184	6454	12	184	7905	12	184	9200
10.2	194.2	6871	10.2	194.2	8415	10.2	194.2	9200
13	207.2	6871	13	207.2	8415	13	207.2	9200
13	220.2	6871	13	220.2	8415	13	220.2	9200
13	233.2	6871	13	233.2	8415	13	233.2	9200
13	246.2	6871	13	246.2	8415	13	246.2	9200
10.5	256.7	7389	10.5	256.7	9050	10.5	256.7	9200
15	271.7	7389	15	271.7	9050	15	271.7	9200
15	286.7	7389	15	286.7	9050	15	286.7	9200
15	301.7	7389	15	301.7	9050	15	301.7	9200
15	316.7	7389	15	316.7	9050	15	316.7	9200
15	331.7	7389	15	331.7	9050	15	331.7	9200
15	346.7	7389	15	346.7	9050	15	346.7	9200
15	361.7	7389	15	361.7	9050	15	361.7	9200
15	376.7	7389	15	376.7	9050	15	376.7	9200
14.6	391.3	7838	14.6	391.3	9200	14.6	391.3	9200
15	406.3	7838	15	406.3	9200	15	406.3	9200
15	421.3	7838	15	421.3	9200	15	421.3	9200
15	436.3	7838	15	436.3	9200	15	436.3	9200
15	451.3	7838	15	451.3	9200	15	451.3	9200
15	466.3	7838	15	466.3	9200	15	466.3	9200
15	481.3	7838	15	481.3	9200	15	481.3	9200
15	496.3	7838	15	496.3	9200	15	496.3	9200
3.7	500	9200	15	511.3	9200	15	511.3	9200
15	515	9200	15	526.3	9200	15	526.3	9200
15	530	9200	15	541.3	9200	15	541.3	9200
15	545	9200	15	556.3	9200	15	556.3	9200
15	560	9200	15	571.3	9200	15	571.3	9200
15	575	9200	15	586.3	9200	15	586.3	9200
15	590	9200	15	601.3	9200	15	601.3	9200
15	605	9200	15	616.3	9200	15	616.3	9200
15	620	9200	15	631.3	9200	15	631.3	9200
20	640	9200	8.7	640	9200	8.7	640	9200