NEXTera ENERGY POINT BEACH

February 6, 2014

NRC 2014-0006
10 CFR 50.54(f)

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

Point Beach Nuclear Plant, Units 1 and 2
Docket 50-266 and 50-301
Renewed License Nos. DPR-24 and DPR-27

NextEra Energy Point Beach, LLC Supplement to Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding 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

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 (ML12073A348)
(2) NRC Letter, Endorsement of EPRI Final Draft Report 1025287, "Seismic Evaluation Guidance," dated February 15, 2013 (ML12319A074)
(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, dated February 2013 (ML12333A17)
(4) NEI Letter to NRC, Proposed Path Forward for NTTF Recommendation 2.1: Seismic Reevaluations, dated April 9, 2013 (ML13107B386)
(5) NRC Letter, EPRI Final Draft Report XXXXXX, "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 ([ML13106A331)
(6) NextEra Energy Point Beach, LLC letter to NRC, Response to NRC Request for Information Pursuant to 10 CFR 50.54(f) Regarding 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, dated September 12, 2013 (ML13256A065)

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.

On September 12, 2013, NextEra Energy Point Beach, LLC submitted the descriptions of subsurface materials and properties and base case velocity profiles to the NRC (Reference 6). The September 12, 2013, letter was based on information provided to EPRI. After that information was received, NEI established guidance which differed from the initial guidance received from EPRI. This is all preliminary information. An evaluation determined that the control point for this report had changed. The enclosure to this letter contains the requested descriptions of subsurface materials and properties and base case velocity profiles for Point Beach Nuclear Plant, Units 1 and 2 with the corrected control point. This enclosure replaces the information provided in Reference (6) in its entirety. The information provided in the enclosure 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 report for Point Beach will be provided to the NRC by March 31, 2014 in accordance with Reference (5).

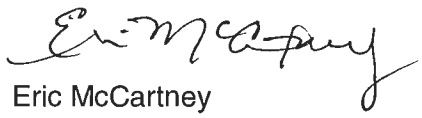
This letter contains no new Regulatory Commitments and no revisions to existing Regulatory Commitments.

If you have any questions please contact Mr. Michael Millen, Licensing Manager, at 920/755-7845.

I declare under penalty of perjury that the foregoing is true and correct. Executed on February 6, 2014.

Very truly yours,

NextEra Energy Point Beach, LLC



Eric McCartney
Site Vice President

Enclosure

cc: Director, Office of Nuclear Reactor Regulation
Administrator, Region III, USNRC
Resident Inspector, Point Beach Nuclear Plant, USNRC
Project Manager, Point Beach Nuclear Plant, USNRC
Ms. Sue Perkins-Grew, NEI

## ENCLOSURE

## NEXTERA ENERGY POINT BEACH, LLC
## POINT BEACH NUCLEAR PLANT

## SEISMIC HAZARD EVALUATION INFORMATION

### 1.0 Point Beach Site Description

The basic information used to create the site geologic profile at the Point Beach Nuclear Power Plant is shown in Table 1. This profile was developed using information documented in References 1, 5, 6 and 7. The SSE is indicated as "unknown" in Ref. 1. Per the SPID guidance, the Safe Shutdown Earthquake (SSE) was taken to be at the elevation of the highest foundation of key structures, which is at elevation +8 ft. The use of this elevation for the Ground Motion Response Spectra (GMRS) comparison to the SSE will be verified as part of the final report.

For dynamic properties of lake deposits and glacial till layers, modulus and damping curves were represented with two models. The first model used soil curves taken from Reference 2, the second model used soil curves taken from References 3 and 4. These dynamic property models were weighted equally.

The three base-case shear-wave velocity profiles used to model amplification at the site are shown in Figure 1. The profiles are a generalization of the data in Table 1, appropriate for glacial till and glacial outwash. Profiles 1, 2, and 3 are weighted 0.4, 0.3, and 0.3, respectively. Thicknesses, depths, and shear-wave velocities (Vs) corresponding to each profile are shown in Table 2.

**Table 1**

| Elevation [1] | Soil / Rock [5] Description | Density [4] (pcf) | Poisson's Ratio [5] | Modulus of Elasticity [5] (psf) | Shear Modulus [5] (psf) | Damping Percent [2,5] | Shear Wave Velocity [4] (fps) |
|---|---|---|---|---|---|---|---|
| +26' to +10' | Glacial till | 130 | 0.45 | $3.0 \times 10^7$ | $1.0 \times 10^7$ | 20 | 900 |
| +10' to -5' | Lake deposits Lacustrine [4] | 125 | 0.49 | $1.5 \times 10^6$ Footnote 3 | $1.5 \times 10^6$ Footnote 3 | 30 | 900 |
| -5' to -25' | | | | | | | |
| -25' to -35' | Glacial till and glacial outwash | 130 | 0.45 | $3.0 \times 10^7$ | $1.0 \times 10^7$ | 20 | 960 |
| -35' to -50' | | | | | | | 1,000 |
| -50' to -75' | | | | | | | 1,030 |
| below -75' | Bedrock (Niagara Dolomite) | 175 | 0.25 | $1.8 \times 10^9$ | $7.5 \times 10^8$ | -- | 12,000 |

Footnotes:

1. Reference elevation 0' is the City of Milwaukee Datum.
2. Expressed as a percentage of critical damping.
3. The moduli for the Lake Deposits should be decreased by 10% for dynamic loads which will be acting on the soil for a large number of repetitions such as an SSE.
4. Reference Report, *Point Beach Nuclear Plant IPEEE, Two Creeks, Wisconsin,* dated June 1995. Shear wave velocities are Recommended 'Best Estimate' Values.
5. From Dames & Moore *Report of Foundation Investigation, Proposed Nuclear Power Plant, Point Beach Nuclear Power Station, Two Creeks, Wisconsin for the Wisconsin Michigan Power Company.*

**Figure 1**
**Vs Profiles for Point Beach Site**

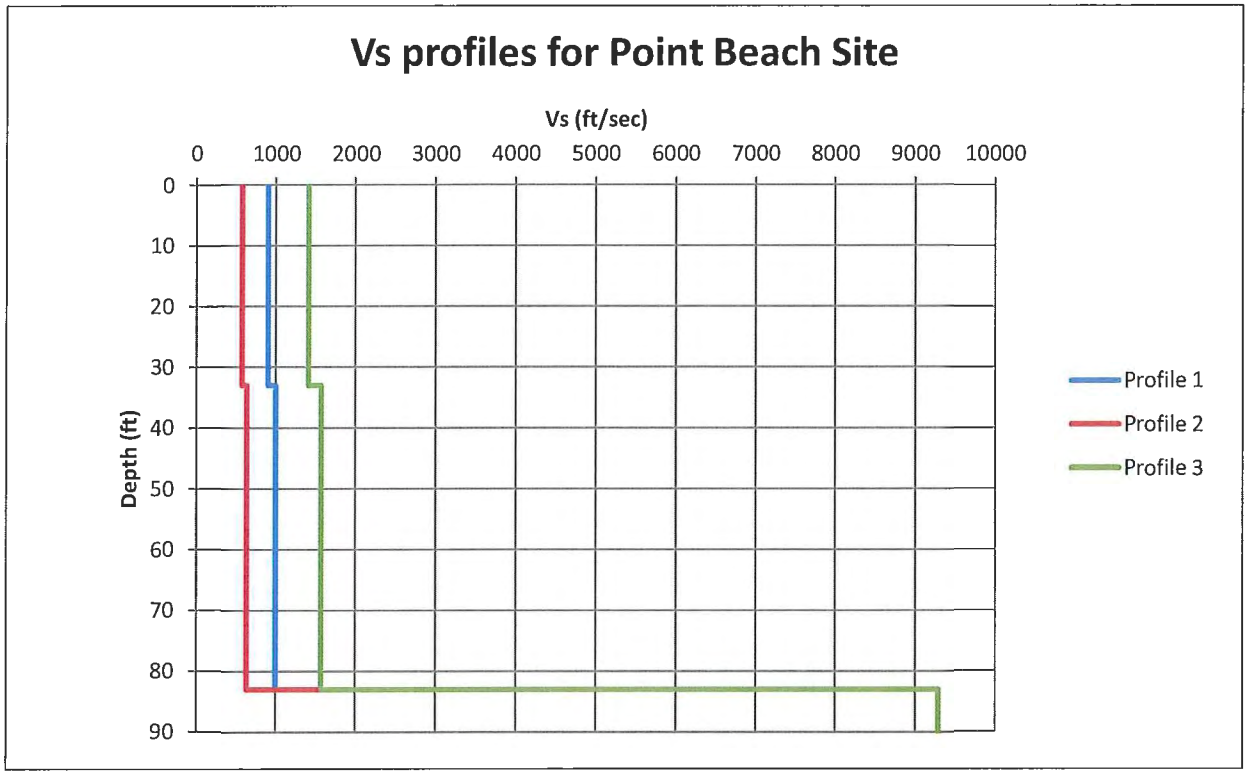


**Table 2**
**Layer Thicknesses, Depths, and Vs for Three Profiles**
**Point Beach Site**

| Profile 1 | | | Profile 2 | | | Profile 3 | | |
|---|---|---|---|---|---|---|---|---|
| Thickness (ft) | Depth (ft) | Vs (ft/s) | Thickness (ft) | Depth (ft) | Vs (ft/s) | Thickness (ft) | Depth (ft) | Vs (ft/s) |
| | 0 | 900 | | 0 | 573 | | 0 | 1413 |
| 3.0 | 3.0 | 900 | 3.0 | 3.0 | 573 | 3.0 | 3.0 | 1413 |
| 5.0 | 8.0 | 900 | 5.0 | 8.0 | 573 | 5.0 | 8.0 | 1413 |
| 5.0 | 13.0 | 900 | 5.0 | 13.0 | 573 | 5.0 | 13.0 | 1413 |
| 5.0 | 18.0 | 900 | 5.0 | 18.0 | 573 | 5.0 | 18.0 | 1413 |
| 2.0 | 20.0 | 900 | 2.0 | 20.0 | 573 | 2.0 | 20.0 | 1413 |
| 8.0 | 28.0 | 900 | 8.0 | 28.0 | 573 | 8.0 | 28.0 | 1413 |
| 5.0 | 33.0 | 900 | 5.0 | 33.0 | 573 | 5.0 | 33.0 | 1413 |
| 5.0 | 38.0 | 1000 | 5.0 | 38.0 | 637 | 5.0 | 38.0 | 1570 |
| 5.0 | 43.0 | 1000 | 5.0 | 43.0 | 637 | 5.0 | 43.0 | 1570 |
| 5.0 | 48.0 | 1000 | 5.0 | 48.0 | 637 | 5.0 | 48.0 | 1570 |
| 2.0 | 50.0 | 1000 | 2.0 | 50.0 | 637 | 2.0 | 50.0 | 1570 |
| 8.0 | 58.0 | 1000 | 8.0 | 58.0 | 637 | 8.0 | 58.0 | 1570 |
| 5.0 | 63.0 | 1000 | 5.0 | 63.0 | 637 | 5.0 | 63.0 | 1570 |
| 5.0 | 68.0 | 1000 | 5.0 | 68.0 | 637 | 5.0 | 68.0 | 1570 |
| 5.0 | 73.0 | 1000 | 5.0 | 73.0 | 637 | 5.0 | 73.0 | 1570 |
| 5.0 | 78.0 | 1000 | 5.0 | 78.0 | 637 | 5.0 | 78.0 | 1570 |
| 5.0 | 83.0 | 1000 | 5.0 | 83.0 | 637 | 5.0 | 83.0 | 1570 |
| 3280.8 | 3363.8 | 9285 | 3280.8 | 3363.8 | 9285 | 3280.8 | 3363.8 | 9285 |

## 2.0 References


(1) Point Beach Updated Final Safety Analysis Report, Sections 1.1, "Site and Environment", 2.2, "Topography" and 2.8, "Geology"

(2) EPRI (1993), *Guidelines for Determining Design Basis Ground Motions*, Electric Power Research Institute, Palo Alto, CA, Report TR-102293, Volumes 1-5

(3) Silva, W.J., N. A. Abrahamson, G.R. Toro, and C. Costantino (1996), *Description and Validation of the Stochastic Ground Motion Model,* Report submitted to Brookhaven National Laboratory, Assoc. Universities Inc., Upton NY 11973, Contract No. 770573

(4) Walling, M.A., W.J., Silva and N.A. Abrahamson (2008), "Nonlinear Site Amplification Factors for Constraining the NGA Models," *Earthquake Spectra,* 24 (1) 243-255

(5) "Report of Foundation Investigation, Proposed Nuclear Power Plant, Point Beach Nuclear Power Station, Two Creeks, Wisconsin for the Wisconsin Michigan Power Company", prepared by Dames & Moore; transmitted by letter from Dames & Moore to PBNP, dated December 2, 1966, Cimage Letter No. NPC99-02748

(6) PBNP Design Guideline DG-C03, Revision 1, "Seismic Design Criteria Guideline"

(7) Point Beach Nuclear Plant IPEEE, Two Creeks, Wisconsin, dated June 1995, prepared by GEI Consultants, Inc., transmitted by Stevenson & Associates on 4/2/2002, Document Identity 93109, S&A title: "The Final GEI Soil Report Dated June 1995 Developed for the IPEEE Study"