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September 24, 2012

ATTN: Document Control Desk U.S. Nuclear Regulatory Commission Washington, DC20555-0001

BELL BEND NUCLEAR POWER PLANTRESPONSE TO RAI No. 37BNP-2012-245Docket No. 52-039

References: 1) M. Canova (NRC) to R. R. Sgarro (PPL Bell Bend, LLC), Bell Bend COLA – Request for Information No. 37 (RAI No. 37) – SEB1 – 2659, 2660, 2661 email dated June 27, 2009

2) BNP-2012-072, R. R. Sgarro (PPL Bell Bend, LLC) to U.S. NRC, "Schedule Information for Responses to Requests for Additional Information for the Bell Bend FSAR," dated March 14, 2012

The purpose of this letter is to respond to the request for additional information (RAI) identified in reference 1. In reference 2, PPL Bell Bend, LLC (PPL) indicated that PPL would provide a response to Request for Additional Information (RAI) No. 37, Question 03.07.01-8 on or before October 1, 2012. This RAI addresses Seismic Design Parameters as discussed in Section 3.7.1 of the Final Safety Analysis Report (FSAR), as submitted in Part 2 of the Bell Bend Nuclear Power Plant (BBNPP) Combined License Application (COLA).

The Enclosure provides our response to RAI No. 37, Question 03.07.01-8, which includes revised COLA content. The revised COLA content will be included in a future revision of the BBNPP COLA. The future revision of the COLA is the only new regulatory commitment in this letter.

Should you have questions, please contact the undersigned at 610.774.7552.

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

Executed on September 24, 2012.

Respectfully,

Rocco R. Sgaro

RRS/kw

Enclosure: As stated

DIDL

Page 2

cc: (w/ Enclosure)

Mr. Michael Canova Project Manager U.S. Nuclear Regulatory Commission 11555 Rockville Pike Rockville, MD 20852

(w/o Enclosure)

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Enclosure

Response to RAI No. 37, Question 03.07.01-8

RAI No. 37

Question 03.07.01-8

In FSAR Section 3.7.1.2 (Percentage of Critical Damping Values) on page 3-38, no exception is taken to the US EPR damping values used in the NI Common Basemat Structures. These values are shown in Table 3.7.1.1 of the US EPR FSAR.

- 1) The site specific ground accelerations (PGA) are 0.21g horizontal and 0.18g vertical, which are both less than the 0.3g PGA of the CSDRS used for design certification. As the site-specific ground accelerations should, in general, result in lower stress levels in the structure, justify in the FSAR why the damping values used in the design certification seismic analysis remain valid for the site specific seismic analysis of the NI structures.
- 2) Regulatory Guide 1.61 states that for the generation of In-Structure Response Spectra (ISRS), structural damping values associated with an Operating Basis Earthquake (OBE) should be used unless a plant-specific technical basis is provided which supports the use of higher than OBE damping values. State the structural damping values used for generation of ISRS for the NI common basemat structures, EPGB and ESWB, and if different from the OBE values stated in RG 1.61, provide a technical justification for the values used.
- 3) In Section 3.7.1.2 (Percentage of Critical Damping Values) on page 3-38 it indicates that 5 percent of critical damping is used for the analysis of the essential service water emergency make-up system (ESWEMS) Pumphouse. RG 1.61 recommends special consideration for development of In-Structure Response Spectra (ISRS). Specifically, the applicant may use OBE damping values (4 percent for reinforced concrete) or submit a plant specific technical-basis for use of damping values higher than the OBE damping values, but not greater than the SSE damping values (7 percent). In addition the applicant has assumed that the concrete is un-cracked, implying low damping values in the structure. What is the technical basis that supports the use of 5 percent damping for this structure?

Response:

- Since the site-specific ground accelerations could produce low stress levels in the structures, the damping values in the Bell Bend Nuclear Power Plant (BBNPP) Combined License Application (COLA) Final Safety Analysis Report (FSAR) Section 3.7.1.2 and 3.7.2.15 will be revised to show the use of Regulatory Guide (RG) 1.61 Rev.1 OBE damping for the site-specific analysis of Nuclear Island (NI) structures.
- 2) The structural damping values used for generation of ISRS for the NI common basemat structures, Emergency Power Generating Buildings (EPGB) and Essential Service Water Building (ESWB), will be the same as those in RG 1.61, Rev. 1, for OBE damping.
- BBNPP COLA FSAR Section 3.7.1.2 will be revised to show the use of RG 1.61 Rev. 1 OBE damping for the analysis of the ESWEMS Pump House using un-cracked concrete properties.

COLA Impact

The BBNPP COLA FSAR will be revised as shown, below:

Table 1.1-1--- {Acronyms Used in this Document}

Acronym	Description
EPGB	Emergency Power Generating Building

3.7.1.2 Percentage of Critical Damping Values

Operating-Basis Earthquake (OBE) structural damping values, defined in Table 2 of Regulatory Guide 1.61, Rev. 1 (NRC, 2007c), are used for the dynamic analysis of site-specific Seismic Category I SSCs and confirmatory SSI analysis of the NI Common Basemat Structures as well as for the EPGB and ESWB. In-structure response spectra (ISRS) for site-specific Seismic Category I structures are also based on OBE structural damping values. The damping values for site-specific Seismic Category II structures are in accordance with Regulatory Guide 1.61, Rev. 1 (NRC, 2007c). In accordance with Regulatory Guide 1.61, Revision 1, the damping value for reinforced concrete structure for SSE level ground motion is 7% of the critical damping. However, the design of the ESWEMS-Pumphouse, conservatively uses a damping value of 5% of the critical damping. The damping used for the foundation medium is discussed in U.S.EPR FSAR Section 3.7.1.2 and Section 3.7.2.15 for the ESWEMS Pumphouse.

3.7.1.4 References

NRC, 2007c. Damping Values for Seismic Design of Nuclear Power Plants, Regulatory Guide 1.61, Revision 1, U.S. Nuclear Regulatory Commission, March 2007.

3.7.2.15 Analysis Procedure for Damping

The EWSEMS <u>Pumphouse</u> <u>Pump House</u> is the only site specific structure addressed in this section. The Soil Structure-interaction analysis <u>uses a structural damping of 5%</u> <u>Regulatory</u> <u>Guide 1.61, Rev. 1 OBE damping (NRC, 2007c)</u> and low strain soil material damping in the range of 0.5 to 1.0 percent. These damping values are directly applied to the respective materials.

The response spectrum analysis utilizes to develop reasonably conservative design, in which seismic loads is based on an envelope response spectrum associated with a damping of 5% of the critical damping. Accordingly, all elements in the analytical model are assigned this damping value.

3.7.2.16 References

NRC, 2007c. Damping Values for Seismic Design of Nuclear Power Plants, Regulatory Guide 1.61, Revision 1, U.S. Nuclear Regulatory Commission, March 2007.