

BellBendCOLPEM Resource

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Sent: Friday, September 04, 2009 10:00 AM
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Subject: RE: Bell Bend COLA - Requests for Information (RAI) No.s 44, 45, 46, and 47
Attachments: Letter 47 RAI 3300 FINAL NSIR-DPR-LIB EP.pdf; Letter 44 RAI 3314 FINAL CHPB.pdf; Letter 45 - RAI 2450 FINAL SEB1.pdf; Letter 46 - RAI 2451 FINAL SEB1.pdf

Attached are RAIs No.44, 45, 46, and 47 for the Bell Bend COL Application. [Having received no specific request for discussion, we are releasing the final version of this document for your action.](#)

You are requested to respond to this request within 30 days. [Response durations are factored into your review schedule. If additional time is required to respond, please inform me of your proposed schedule to respond at your earliest opportunity.](#)

If you have any questions, please contact me.

Michael A. Canova

Project Manager - Bell Bend COL Application
Docket 52-039
EPR Project Branch
Division of New Reactor Licensing
Office of New Reactors
301-415-0737

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MESSAGE	708	9/4/2009 10:00:29 AM
Letter 47 RAI 3300 FINAL NSIR-DPR-LIB EP.pdf		35975
Letter 44 RAI 3314 FINAL CHPB.pdf	17293	
Letter 45 - RAI 2450 FINAL SEB1.pdf	14810	
Letter 46 - RAI 2451 FINAL SEB1.pdf	14927	

Options

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Request for Additional Information No. 47

8/10/2009

Bell Bend
PPL Bell Bend LLC.
Docket No. 52-039
SRP Section: 13.03 - Emergency Planning
Application Section: Part 5

QUESTIONS for Licensing and Inspection Branch (NSIR/DPR/LIB) (EP)

13.03-2

Evacuation Time Estimate (ETE)-1: Estimated Population Growth
Acceptance Criteria: SRP Requirements A and H; Acceptance Criterion 11
Regulatory Basis: 10 CFR 52.79 (a) (21), Section IV of Appendix E to 10 CFR 50

- A. Population estimates in the ETE were based on data from the 2000 U.S. Census and projected to the year 2009 using Year 2000 Census block point data. In Table 3-2, “[emergency planning zone] EPZ Permanent Resident Population,” the 2000 Population is 69,718, from which the 2009 population is projected. The year 2000 population in Table 3-2 differs from the “UniStar Nuclear Services Bell Bend Nuclear Power Plant Environmental Report” (ER) Table 2.5-6, “Resident and Transient Populations by Sector and Distance from BBNPP Site, 2000,” and the Final Safety Analysis Report (FSAR) Table 2.1-3, “{SECPop Population for Counties within 10 mi (16 km) Radius of BBNPP (2000-2006)},” which provides a 2000 population of 49,596 people. Describe the reason the ETE year 2000 census block data is greater than resident populations described in the EP and in the FSAR. Make appropriate revisions to the ETE report, if necessary.
- B. Table 3-1, “Population Estimates by County,” provides annual growth rates for counties within or surrounding the EPZ. The ETE states that these growth rates were used in 2009 permanent resident projections provided in Table 3-2, “EPZ Permanent Resident Population.” However, 2009 population projections in Table 3-2 do not correlate with the annual growth rate projections identified in Table 3-1. For example in Table 3-2, emergency response planning area (ERPA) 21 in Luzerne County has a 2000 and 2009 population of 10,930 people (indicating a zero percent growth over a nine year period); while Table 3-1, shows an annual growth rate in Luzerne County of 0.21 percent. Explain how growth rates provided in Table 3-1 are utilized to develop the population values for Table 3-2. Make appropriate revisions to the ETE report, if necessary.

13.03-3

ETE-2: ETE Methodology
Acceptance Criteria: SRP Requirements A and H; Acceptance Criterion 11
Regulatory Basis: 10 CFR 52.79 (a) (21), Section IV of Appendix E to 10 CFR 50

- A. Section 2, “Study Estimates and Assumptions,” states that in Figure 2-1, “Assumed Evacuation Response,” the area which is within the EPZ but outside the evacuation

region (Regions R08-R22), will have a voluntary evacuation of 50 percent. Figure 2-1 (Regions R08-R22) shows a 35 percent voluntary evacuation rate for this area. Clarify whether the blue area depicting Regions R08-R22 in Figure 2-1 will have a 35 percent or 50 percent voluntary evacuation rate.

13.03-4

ETE-3: ETE Methodology

Acceptance Criteria: SRP Requirements A and H; Acceptance Criterion 11

Regulatory Basis: 10 CFR 52.79 (a) (21), Section IV of Appendix E to 10 CFR 50

- A. Section 4, "Estimation of Highway Capacity," describes the approach for estimating highway capacity and provides the algorithm and equation used for the approach to a signalized intersection. Explain how the variables are derived, specifically for the Mean Duration of Green Time and Mean Queue Discharge, for the capacity of an approach to a signalized intersection.
- B. Using the equation presented on page 4-2, discuss how traffic control is included in the intersection analysis.
- C. Appendix D, "Detailed Description of Study Procedure," identifies the steps to perform the ETE calculations. Step 10 in Appendix D discusses that changing control treatment at critical intersections can improve service and expedite movement of traffic. Discuss any model treatments that were used to expedite movement of traffic through intersections, and revise the ETE report as needed.
- D. Discuss the effect on the ETE if the county specific traffic management plans were used in the analysis. Revise the ETE report as needed.

13.03-5

ETE-4: Demand Estimation, Permanent Residents

Acceptance Criteria: SRP Requirements A and H; Acceptance Criterion 11

Regulatory Basis: 10 CFR 52.79 (a) (21), Section IV of Appendix E to 10 CFR 50

- A. Table 8-1, "Transit Dependent Population Estimates," identifies 2,036 residents requiring transportation. Discuss whether any of these residents may have special needs and require specialized transportation. Revise the ETE report as needed.
- B. Section 8.1, "Transit-Dependent People – Demand Estimate," states that county emergency plans estimates 8,174 people as transit dependent. Provide a more detailed explanation to support use of 2,036, rather than 8,174 residents, for the transit dependent population, including confirmation from county authorities that the lower estimate is appropriate for use in evacuation planning. Revise the ETE report as needed.

13.03-6

ETE-5: Demand Estimation, Transient Populations

Acceptance Criteria: SRP Requirements A and H; Acceptance Criterion 11

Regulatory Basis: 10 CFR 52.79 (a) (21), Section IV of Appendix E to 10 CFR 50

- A. Section 3, "Demand Estimation," "State Parks," states that based on aerial imagery, an estimate of 30 percent non-EPZ residents was developed. Discuss how aerial imagery of parking lots supports determination of the number of non-EPZ residents, and revise the ETE report as needed.
- B. Section 3, "Demand Estimation," identifies 475 resident students at the Penn State Hazleton campus. Discuss whether transit dependent needs were considered for this population group, and revise the ETE report as needed.
- C. The number of commuting employees is presented in Figure 3-7, "Employee Population by Sector," and shows 360 employees within 3 miles of the plant as those working at SSES. Explain why Bell Bend employees who will commute to work are not included in Figure 3-7. Revise the ETE report as needed.
- D. Transient estimations in the FSAR Section 2.1.3.3.1, "Transient Population Within 10 mi (16 km)," and ER Table 2.5-6, "Resident and Transient Population by Sector and Distance from BBNPP Site, 2000," differ from those in the ETE. The FSAR states there are seven camping facilities located within 10 miles of Bell Bend Nuclear Power Plant, and the ETE states there are five camping facilities within the EPZ. Major employers and number of employees also differ between the FSAR and ETE. Table 2.1-6, "{Transient Population Facilities-Major Employers Within 10 mi (16 km) Radius of BBNPP}," of the FSAR and Appendix E, "Special Facility Data," of the ETE differ in both major employers and the number of employees at facilities. Discuss the difference in transient estimations provided. Revise the ETE report as needed.
- E. Table 6-3, "Percent of Population Groups Evacuating for Various Scenarios," indicates that the largest percent of transients occurs during winter scenarios. However, Section 3, "Demand Estimation," identifies golf courses, state parks, campgrounds, etc., as locations that attract transients. Discuss the basis for your conclusion that the winter scenarios have the larger transient populations.
- F. Table 6-3, "Percent of Population Groups Evacuating for Various Scenarios," shows that 52 percent of residents with commuters in household will await the return of the commuter before evacuating. Appendix F, "Telephone Survey," (page F-7) states 60 percent of respondents would await the return of a commuter before evacuating. Discuss whether 52 percent or 60 percent of residents with commuters in their household was used, and what the effect on the ETE is if the 60 percent factor is used. In addition, provide justification for your conclusion that 52 percent is the appropriate factor to use for this calculation. Revise the ETE report as needed.

13.03-7

ETE-6: Demand Estimation, Special Facility Population

Acceptance Criteria: SRP Requirements A and H; Acceptance Criterion 11

Regulatory Basis: 10 CFR 52.79 (a) (21), Section IV of Appendix E to 10 CFR 50

- A. Several special facilities listed in Table 8-4, "Special Facility Transit Demand," are missing census information and capacity values. This includes the Bonham Nursing Center, which identifies a capacity of 67 but does not include transportation resources, and the Birchwood Nursing Home, which identifies a census of 76 persons but only identifies one bus to serve the facility.
 - 1. Discuss why capacity values are not included in Table 8-4 and are not used to develop transportation requirements. Revise the ETE report as needed.
 - 2. Explain why some special facilities in Table 8-4 do not require transportation resources to support an evacuation. Revise the ETE report as needed.

- B. Table 8-4 identifies the need for 49 ambulances, and Table 8-4A, "Risk Municipality Medical Transportation Requirements," identifies a need for 57 ambulances.
 - 1. Clarify if the 57 ambulances identified in Table 8-4A are for transit dependent residents or special facility residents. Revise the ETE report as needed.
 - 2. Discuss the total number of ambulances needed to support an evacuation. Revise the ETE report as needed.

- C. Table 8-2A, "Luzerne County Schools," and Table 8-2B, "Columbia County Schools," identify the need for 185 buses to evacuate school facilities within the EPZ. Supplemental local emergency plans identify 177 buses between Luzerne and Columbia Counties. Discuss whether 177 or 185 buses are needed to respond. Revise the ETE report as needed.

- D. Section 2.5.1.1.3.2, "Transient Population Levels," in the Environmental Report states that the State Correctional Institutions (SCI) Retreat is located 8 miles north of Bell Bend Nuclear Power Plant. However this facility is not identified in Table 8-4, "Special Facility Transit Demand" in the ETE study.
 - 1. Discuss the transportation resources and logistics for evacuation of this facility. Revise the ETE report as needed.

13.03-8

ETE-7: Demand Estimation, Emergency Planning Zone (EPZ)

Acceptance Criteria: SRP Requirements A and H; Acceptance Criterion 11

Regulatory Basis: 10 CFR 52.79 (a) (21), Section IV of Appendix E to 10 CFR 50

- A. Table 8-5A, "School Evacuation Time Estimates – Good Weather," indicates that the distances from Garrison Memorial Elementary School, Huntington Mills Elementary School and Northwest Area High School to the EPZ boundary is 11 miles. Discuss how traveling these distances through the EPZ reflects a generally radial evacuation, as recommended in NUREG 0654. Revise the ETE report as needed.

13.03-9

ETE-8: Traffic Capacity, Evacuation Roadway Network

Acceptance Criteria: SRP Requirements A and H; Acceptance Criterion 11

Regulatory Basis: 10 CFR 52.79 (a) (21), Section IV of Appendix E to 10 CFR 50

- A. Figure 1-2, "SSES/Bell Bend Link-Node Analysis Network," shows the nodes used in the analysis, but the nodes are not labeled to correspond to Appendix K, "Evacuation Roadway Network Characteristics." Provide a map in a revision to the ETE report that includes legible node numbers that correspond to Appendix K.

13.03-10

ETE-9: Traffic Capacity, Roadway Segment Characteristics

Acceptance Criteria: SRP Requirements A and H; Acceptance Criterion 11

Regulatory Basis: 10 CFR 52.79 (a) (21), Section IV of Appendix E to 10 CFR 50

- A. Section 4, "Estimation of Highway Capacity," states that capacity of highway sections is a function of, among other things, percent of heavy trucks. Identify the percent of heavy trucks used in the analysis for evacuation of the general public in a revision to the ETE report.

13.03-11

ETE-10: Analysis of Evacuation Times, Methodology, Transit Dependent

Acceptance Criteria: SRP Requirements A and H; Acceptance Criterion 11

Regulatory Basis: 10 CFR 52.79 (a) (21), Section IV of Appendix E to 10 CFR 50

- A. In Section 8.4, "Evacuation Time Estimates for Transit-Dependent People," Evacuation of Ambulatory Persons from Special Facilities, the average speed output by the model at 120 minutes is identified as 20.4 mph. A conservative travel distance out of the EPZ is 5 miles, corresponding to a 6 minute travel time. Explain how a 6 minute travel time was determined. Revise the ETE report as needed.
- B. Section 8.4, "Evacuation Time Estimates for Transit-Dependent People," states that bus return to the EPZ for a second wave evacuation would take 20 minutes. However, the average distance from the reception centers to the EPZ boundary is 30 miles. Explain how buses are assumed to travel 30 miles in 20 minutes. Revise the ETE report as needed.
- C. The ETE for special facilities using Emergency Medical Services (EMS) Vehicles is based on a speed of 42.9 mph at 60 minutes into the event. However, there is a mobilization time of 60 minutes and a loading time of 30 minutes for EMS vehicles, for a total of 90 minutes prior to beginning the evacuation. Discuss why the speed at 60 minutes was used instead of the speed at 90 minutes. Revise the ETE report as needed.

13.03-12

ETE-11: Analysis of Evacuation Times, Methodology, Special Facilities

Acceptance Criteria: SRP Requirements A and H; Acceptance Criterion 11

Regulatory Basis: 10 CFR 52.79 (a) (21), Section IV of Appendix E to 10 CFR 50

- A. Table 8-4 uses the current facility population in determining resources needed to support an evacuation. Discuss the effect on the ETE if special facility peak capacity values are used in the analysis, and include this in a revision to the ETE report, if necessary.
- B. County plans include requirements that teachers take roll once students are loaded onto buses, and some schools have large enrollments, such as Valley Elementary/Middle School, (1,109 students). Information is needed to support a bus loading time of 5 minutes. Discuss the assumptions and logistics for queuing buses, loading students, taking roll, and departing the school in 5 minutes in a revision to the ETE report.

13.03-13

ETE-12: Other Requirements, Confirmation of Evacuation

Acceptance Criteria: SRP Requirements A and H; Acceptance Criterion 11

Regulatory Basis: 10 CFR 52.79 (a) (21), Section IV of Appendix E to 10 CFR 50

- A. Section 12, "Confirmation Time," provides a time estimate for confirmation of the evacuation; however, the process provided is a suggested alternative. Discuss whether the counties have agreed with the ETE plans for confirmation of evacuation using a telephone survey approach. Revise the ETE report as needed.
- B. Discuss whether the time required to obtain telephone numbers of residents has been included in the time estimate. Revise the ETE report as needed.

13.03-14

ETE-13: Other Requirements, Draft Review

Acceptance Criteria: SRP Requirements A and H; Acceptance Criterion 11

Regulatory Basis: 10 CFR 52.79 (a) (21), Section IV of Appendix E to 10 CFR 50

Appendix G, "Traffic Management," states that there are likely to be concerns about manpower and equipment shortages. The county and local municipal emergency plans have more traffic control points distributed very differently than the traffic control plan in Appendix G. Discuss whether State and local organizations reviewed the ETE report and provided any comments or concerns. Revise the ETE report as needed.

Request for Additional Information No. 44

8/10/2009

Bell Bend
PPL Bell Bend LLC.

Docket No. 52-039

SRP Section: 12.03-12.04 - Radiation Protection Design Features

Application Section: 12.03 Radiation Protection Design Features

QUESTIONS for Health Physics Branch (CHPB)

12.03-12.04-1

10 CFR 20.1502 requires that licensees monitor exposures from licensed and unlicensed radiation sources under their control.

(1) Confirm whether neutron radiation exposure from the Susquehanna Steam Electric Station, Units 1 and 2 (SSES) independent spent fuel storage installation (ISFSI) was included in the estimated construction worker dose.

(2) Provide information on what the neutron dose to construction workers is due to the SSES ISFSI, as well as how this dose was measured or calculated.

(3) If your conclusion is that the dose is negligible, provide information supporting this conclusion (such as neutron survey results, etc.).

12.03-12.04-2

Section 12.3.1.6 of the DC FSAR application contains conceptual design information that is outside the scope of the U.S. EPR design certification related to the following facilities: access building, personnel decontamination area, portable instrument calibration facility, respiratory facility, equipment decontamination facility, radioactive material storage facility, and facility for dosimetry processing and bioassay.

RG 1.206, Part C.I.1.8, "Site and Plant Design Interfaces and Conceptual Design Information," states that the NRC staff expects COL applicants who reference a certified design to provide complete designs for the entire facility including appropriate site-specific design information to replace the conceptual design portions of the DCD for the referenced certified design.

The applicant incorporated EPR FSAR Section 12.3.1 by reference without addressing the site-specific facilities identified in Section 12.3.1.6. Update section 12.3 of the BBNPP FSAR to include those portions of the conceptual design information described in Section 12.3.1.6 of the EPR FSAR that will be incorporated into the BBNPP Unit 3 site-specific design. Alternatively, provide the site-specific design information which will replace the conceptual design provided in the DCD.

12.03-12.04-3

There appears to be typographical errors in Section 12.3 of the application as follows:

In Section 12.3.5.1.4, page 12-9, the first two sentences in the last paragraph are unclear.

Table 12.3-5 shows 1.41E+5 Ci (5.22 E+5) Bq of iodine-131 in gaseous releases in 2006. The numerical values are not equivalent and the Ci release appears excessive for routine operation.

Table 12.3-8 shows 4.10 mrem/yr (0.410) uSv/yr shoreline dose for 2004. The numerical values appear to be reversed.

Update the FSAR to include the revised information or provide justification as to why the information provided is correct.

Request for Additional Information No. 45

8/10/2009

Bell Bend
PPL Bell Bend LLC.
Docket No. 52-039

SRP Section: 03.03.01 - Wind Loading
Application Section: FSAR Table 2-0.1 & FSAR 3.3

QUESTIONS for Structural Engineering Branch (AP1000/EPR Projects) (SEB1)

03.03.01-1

To meet relevant NRC requirements, section 3.3.1 for NUREG 0800 presents acceptable values for wind force calculations. NUREG 0800 is not a substitute for NRC regulations; however, the applicants are required to identify any differences between NUREG 0800 and their independent approach, always supported with the related technical justification. The importance factor accounts for the degree of hazard to human life and damage to buildings and structures.

Please clarify which value is selected for the importance factor "I" to be used for the wind force calculation. The importance factor "I" presented in FSAR Table 2.0-1 is not the same as that which is proposed in EPR FSAR section 3.3.1.2, or the one in FSAR section 2.3.1.2.2.15. Please explain this variance, indicate the value for the importance factor used in the wind force calculation, and provide its technical justification.

In order for the NRC staff to determine whether the selected importance factor value is adequate for the site, please provide additional information about this factor and demonstrate compliance with General Design Criteria -2 in 10 CFR 50, Appendix A.

Request for Additional Information No. 46

8/10/2009

Bell Bend
PPL Bell Bend LLC.
Docket No. 52-039

SRP Section: 03.03.02 - Tornado Loads
Application Section: FSAR section 3.3.2.3

QUESTIONS for Structural Engineering Branch (AP1000/EPR Projects) (SEB1)

03.03.02-1

General Design Criteria (GDC) -2 and GDC-4 in 10 CFR Part 50, Appendix A requires applicants to demonstrate that structures, systems and components (SSCs) important to safety shall withstand the effects of natural phenomena and postulated accidents. Tornado-generated missiles are part of both criteria. Please revise section 3.3.2.3 of the FSAR to include sufficient information to demonstrate that missiles generated from the collapse of structures that are not designed for tornado loads are bounded by the EPR DC FSAR 3.5.1.4 missile spectrum.

Additionally, please provide the technical basis for FSAR 3.3.2.3 statement of missiles generated from the collapse of site-specific structures that are not designed to withstand tornadoes are bounded by the EPR FSAR 3.5.1.4 missile spectrum. Describe the missiles that may be generated by the collapse of the site-specific structures listed in Bell Bend Nuclear Power Plant (BBNPP) FSAR Section 3.3.2.3, and explain how these missiles are bounded by the missile spectrum in Regulatory Guide 1.76. Please also explain the immediate and subsequent effect of the impact of these potential missiles on safety-related structures at BBNPP.

In order for the NRC staff to determine that structures that are not designed to withstand tornadoes will not represent a hazard for safety-related functions, please provide additional information about these structures and demonstrate compliance with GDC-2 and GDC-4 in 10 CFR 50, Appendix A.