## BellBendCOLPEm Resource

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**Sent:** Tuesday, April 26, 2011 4:24 PM
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**Cc:** BellBendCOL Resource; Colaccino, Joseph; Vrahoretis, Susan; Roach, Edward; Dehmel, Jean-Claude; Clark, Phyllis
**Subject:** Bell Bend COLA - Draft Request for Information No. 101 (RAI No. 101- RHPB 5420, 5422, 5427, 5459, 5473, 5503
**Attachments:** Draft RAI Letter 101 - 5420, 5422, 5427, 5459, 5473, 5503 CHPB.doc

Attached is DRAFT RAI No.101 for the Bell Bend COL Application. You have ten working days to review this request and to decide whether you need a conference call to discuss it. Please notify me of your decision in this regard.

After the call, or after ten days, the RAIS will be finalized and sent to you. The schedule for response submittal will be established prior to formalizing this RAI .

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

**Hearing Identifier:** BellBend_COL_Public
**Email Number:** 513

**Mail Envelope Properties** (77BCCD26C6050B42A72FE3939CF492ED776B69D826)

**Subject:** Bell Bend COLA - Draft Request for Information No. 101 (RAI No. 101- RHPB 5420, 5422, 5427, 5459, 5473, 5503
**Sent Date:** 4/26/2011 4:23:58 PM
**Received Date:** 4/26/2011 4:24:01 PM
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| **Files** | **Size** | **Date & Time** | |
|---|---|---|---|
| MESSAGE | 655 | 4/26/2011 4:24:01 PM | |
| Draft RAI Letter 101 - 5420, 5422, 5427, 5459, 5473, 5503 CHPB.doc | | | 67578 |

**Options**
**Priority:** Standard
**Return Notification:** No
**Reply Requested:** No
**Sensitivity:** Normal
**Expiration Date:**
**Recipients Received:**

RAI Letter No. 101

Application Revision 2

**DRAFT**

4/26/2011

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

**Request for Additional Information No.5427**
SRP Section: 11.02 - Liquid Waste Management System
Application Section: 11.2

QUESTIONS for Health Physics Branch (CHPB)

11.02-2

Section II.D of Appendix I to 10 CFR 50 requires that Liquid radwaste systems for light water cooled nuclear power reactors include all items of reasonably demonstrated technology that when added to the system sequentially and in order of diminishing cost-benefit return can for a favorable cost benefit ratio effect reductions in dose to populations reasonably expected to be within a 50 mile radius of the reactor. SRP Section 11.2 of NUREG-0800 and RG 1.206 require each applicant for a permit to construct and operate a power reactor to provide reasonable assurance that the design objectives for as low as reasonably achievable effluent releases are satisfied by the liquid radwaste system. The applicant should demonstrate by means of a cost benefit analysis (CBA) that further reductions to the cumulative dose to the population in the 50-mile (80 km) radius cannot be effected at an annual cost of $1,000 per person-rem (or person-thyroid-rem) for a particular case and additional treatment technology.

SRP Section 11.2 and RG 1.206 refer to Regulatory Guide 1.110 as providing acceptable methods for performing a CBA. The cost-benefit analysis presented by the applicant in BBNPP FSAR Tier, Section 11.2.4 needs to be reviewed based on separate analysis performed by the NRC staff. As such, the applicant needs to provide a complete evaluation, including methodology used, components considered, and all assumptions and parameters used.

BBNPP has referenced the Environmental Report (ER) Section 5.4 as providing the detailed assumptions used in determining the base case and augmented radwaste system analysis, rather than providing the information as part of the BBNPP FSAR Section 11.2, as noted in SRP Section 11.2 and RG 1.206. Section 5.4.3 in turn provides reference back to BBNPP ER Section 3.5 for detailed data input to PWR-GALE and LADTAP II code calculations. However, there is some information and parameters that are in question or that were not provided or adequately described in the applicant's analysis. The applicant is requested to review the staff's observations and revise FSAR Tier 2, Section 11.2.4 accordingly. The applicant is requested to:

1. Explain how or confirm that the “Base Case” population doses as they appear in BBNPP Table 11.2-8 (and in Table ER 3.5-17) do not already include the use of demineralizer decontamination factors as the basis of the liquid effluent source term, and whether the analysis and results of population doses in ER Table 5.4-19 already include the use of a demineralizer system in the corresponding source term calculation (normal operation and anticipated operational occurrences). These assumptions and use of parameters appear to be inconsistent with the standard U.S. EPR design application, which includes a demineralizer system and application of associated decontamination factors.

2. Explain differences for or provide the variables assigned to the base case and augmented case used for the PWR-GALE and LADTAP II code inputs. For example, identify all differences in LWMS system configurations and assumptions between the base case versus the augmented case, such as differences in flow rates, decontamination factors, and resulting radioactive source terms.

3. Explain the basis of the 400-gpm demineralizer clean waste flow rate in BBNPP FSAR Table 11.2-9 considering that it is inconsistent with the normal flow rate shown as item 27 in BBNPP FSAR Table 11.2-1 and U.S. EPR FSAR Tier 2, Table 11.2-2. Also, confirm and compare the cost data shown in BBNPP FSAR Table 11.2-9, derived from the above flow rate, with the cost information presented in BBNPP ER Section 3.5.2.

4. Determine whether the system augmentation complies with Section II.D of Appendix I to 10 CFR Part 50, given that the methodology summarized in BBNPP FSAR Section 11.2.4 and FSAR Tables 11.2-8 to 11.2-10 describes a process different than noted in RG 1.110, Regulatory Position C.5 and Appendix A, while stating in FSAR Section 11.2.4 that the method applies RG 1.110. The applicant is requested to describe the equivalency and conservatism of the method applied in the BBNPP FSAR, or revise the methodology accordingly using the guidance of RG 1.110.

5. Provide, as per NUREG-0800, SRP 11.2 and RG 1-206, the information that supports the CBA of FSAR Section 11.2 and appropriate references to ensure that all assumptions and values applied in the CBA are fully contained in BBNPP FSAR Tier 2, Section 11.2.4, as opposed to referencing the BBNPP Environmental Report for essential supporting data. This approach would facilitate the staff’s evaluation and preparation of the BBNPP safety evaluation report.

For all above items, the applicant is requested to describe in its response and revisions of BBNPP FSAR Section 11.2.4 the methodology, assumptions, and provide the supporting information and applied data to enable the staff to conduct an independent evaluation of the CBA and confirm the results and conclusions presented by the applicant in BBNPP FSAR Tier 2, Section 11.2.4 using SRP Section 11.2, RG 1.109 and RG 1.110, and the PWR-GALE and LADTAP II computer codes.

**Request for Additional Information No. 5459**
SRP Section: 11.02 - Liquid Waste Management System
Application Section: 11.2

11.02-3

BBNPP has proposed alternate input variables for the GALE code from those that were used in the U.S. EPR FSAR. The new input variables are listed in BPNPP FSAR Table 11.2-1. The original U.S. EPR FSAR GALE code input variables appear in their Table 11.2-3, “Liquid and Gaseous Effluent Input Parameters for the PWR-GALE Computer Code.” The COL applicant states that they are not deviating from the use of the PWR-GALE code for calculating annual effluent releases as recommended by NUREG-0800, “Standard Review Plan,” and Regulatory Guide 1.206, “Combined License Applications for Nuclear Power Plants.” Instead, BBNPP has chosen to use different input parameters from those used in the U.S. EPR FSAR, and as such this is a departure from the referenced design certification.

Specifically, BBNPP has departed from NUREG-0017 by modifying the C-14 source term released as gaseous effluents. NUREG-0017, Section 2.2.25, states that the 7.3 Ci/yr value assumes most of the carbon-14 will form volatile compounds. This C-14 source term is based on actual plant measurements. With respect to dose calculations, NRC guidance and dose calculation methods assume that C-14 is present as oxides (CO and $CO_2$). In FSAR Tier 2, Section 11.2.3.2, the applicant first assumes a C-14 source term of 15.8 Ci/yr by applying an adjustment factor in accounting for the difference in the rated thermal power level of the U.S. EPR design. The adjustment is based on a comparison of the U.S. EPR design thermal power with that of thermal power levels given in NUREG-0017 for the plants forming the basis of the 7.3 Ci/yr. In addition to this adjustment, the applicant applies another correction factor for the assumed distribution of organic and inorganic forms of C-14 compounds. The applicant applies a correction factor 20% to the C-14 source term of 15.8 Ci/yr, resulting in final C-14 source term of 18.9 Ci/yr. The applicant states that this estimated C-14 source term is expected to be released in an organic form (80% methane) and as an oxide (20% $CO_2$). However, the justification for the 20% adjustment is not explained in the BBNPP FSAR and how this distribution would be applied in calculating associated doses to offsite receptors.

Based on a review of the U.S. EPR design (FSAR Tier 2, Section 11.3.2), NUREG-0017, and the EPRI 2010 Technical Report on estimation of C-14 in nuclear power plant gaseous effluent releases, the staff does not concur with these adjustments and assumed distribution of organic and oxide forms of C-14 compounds. Specifically, the applicant is requested to evaluate the following staff observations and revise BBNPP FSAR Tier 2, Section 11.2.3.2 accordingly. The applicant is requested to:

1. provide the justification for the applied 20% adjustment in correcting the C-14 distribution (80% methane and 20% $CO_2$).

2. describe how associated C-14 offsite doses would be calculated for this assumed distribution of C-14 (80% organic form and 20% oxide) using the methodology of RG 1.109 and GASPAR II computer code.

3. consider the effects of the $H_2/O_2$ recombiner (high temperatures and oxidizing conditions) of the U.S. EPR gaseous waste processing system on the distribution of C-14 compounds present in gaseous effluents.

4. address and revise, given the resolution of staff observations, the C-14 source term in confirming compliance with the effluent concentration limits of Part 20 (Appendix B, Table 2, Column 1); dose limits to members of the public under Parts 20.1301 and 20.1302; Part 20.1301(e) in complying with 40 CFR Part 190 for all exposure pathways; and design objectives of Section II.A of Appendix I to Part 50.

5. revise the designation of Turkey Point Units 1 and 2 in FSAR Tier 2, Table 11.2-4 since Turkey Point Units 1 and 2 are fossil-fired power plants.

For all of the above, the applicant is requested to describe in its response and revisions of BBNPP FSAR Tier 2, Section 11.2.3, the methodology, assumptions and default parameters used in finalizing the C-14 source term, and updating offsite effluent concentrations and dose results. The applicant should provide sufficient information to enable the staff to conduct an independent evaluation of the C-14 source term and offsite effluent concentrations, doses to members of the public and populations, and confirm the results and conclusions of regulatory compliance presented by the applicant in BBNPP FSAR Tier 2, Section 11.2.3 using SRP Section 11.2; RG 1.206, 1.109 and 1.111; and the GASPAR II computer code (NUREG/CR-4653).

**Request for Additional Information No. 5473**
SRP Section: 11.02 - Liquid Waste Management System
Application Section: 11.2

11.02-4

BBNPP has chosen an operational practice that relies on 100% recycling of shim bleed as compared to the approach used in the U.S. EPR design basis and supporting calculations in developing effluent releases and offsite doses. The radiological consequences of this departure on liquid and gaseous effluent source terms, differences in radionuclide concentrations in releases to unrestricted areas, and offsite doses are addressed in separate RAIs. Rather, the focus of this RAI is on whether BBNPP needs to identify operational procedures to ensure that 100% shim bleed recycling is the preferred mode of operation and set restrictions on effluent releases when it is not possible due to equipment down time and failures. Accordingly, the applicant is requested to evaluate the following concerns and revise BBNPP FSAR Tier 2, Sections 11.2, and 13.5.1 and 13.5.2 accordingly. The applicant is requested to:

1. Describe how plant procedures will address an operating mode that relies on 100% shim bleed recycling,

2. Identify conditions and expected duration, as anticipated operational occurrences, when 100% shim bleed recycling will not be feasible,

3. Describe how operating procedures will address situations when 100% shim bleed is not feasible, and

4. Describe actions to be taken by plant operators when 100% shim bleed is not feasible in recognizing that (i) liquid and gaseous effluent source terms may be markedly different, (ii) there may be a need to evaluate resulting releases and offsite doses, and (iii) make appropriate changes to instrumentation set-points in controlling and monitoring offsite doses using the plant's standard radiological effluent controls and offsite dose calculation manual in demonstrating compliance with Part 20.1301 and 20.1302, Part 20 Appendix B effluent concentration limits, and Part 50, Appendix I design objectives.

**Request for Additional Information No. 5503**
SRP Section: 11.02 - Liquid Waste Management System
Application Section: 11.2

11.02-5

BBNPP has proposed alternate input variables for the PWR-GALE code from those that were used in the corresponding sections of the U.S. EPR FSAR. The new input variables are listed in BPNPP FSAR Table 11.2-1, with the resulting changes in source terms presented in BBNPP FSAR Tables 11.2-2 (liquid effluent releases) and 11.2-3 (gaseous effluent releases). The original U.S. EPR FSAR PWR-GALE code input variables appear in Table 11.2-3, "Liquid and Gaseous Effluent Input Parameters for the GALE Computer Code." The applicant states that the approach is not a deviation from the use of the PWR-GALE code for calculating annual effluent releases as recommended by NUREG-0800, "Standard Review Plan," Regulatory Guide 1.206, "Combined License Applications for Nuclear Power Plants," and NUREG-0017 (PWR-GALE Code). Instead, BBNPP has chosen to use different input parameters from those used in the U.S. EPR FSAR, and as such this is stated to be a departure from the referenced design certification.

Specifically, BBNPP has departed from NUREG-0017 by modifying the assumptions on the amount of shim bleed that is processed and discharged as liquid waste. The shim bleed is typically processed through an evaporator and reused or disposed of as solid waste. The distillate is recycled back to the reactor coolant as makeup or discharged to the environment as liquid radioactive waste. Under NUREG-0017, the fraction of shim bleed that is discharged after processing may vary between 10% and 100%, based on the capability of the system to process liquid waste during equipment downtime, waste volume surges, tritium control requirements, and tank surge capacity. A minimum value of 10% discharge for liquid radioactive waste treatment system is used when the system is designed for maximum waste recycle, when the system capacity is sufficient to process wastes for reuse during equipment downtime and anticipated operational occurrences, and when a discharge option and path are identified. In its departure, BBNPP has assumed no recycling and has recalculated gaseous and liquid effluent yearly releases using that assumption. While the staff agrees that the assumption of 100% recycling will have an effect on the amounts of radioactivity present in gaseous and liquid effluent releases, the staff does not concur with the stated assumptions and results of the revised source terms.

Specifically, the applicant is requested to evaluate the following staff observations and revise BBNPP FSAR Tier 2, Section 11.2.3.2 accordingly.

1. With respect to tritium, 100% shim bleed recycling has the potential of impacting tritium levels and build up in primary system coolant. Plants typically control the normal tritium buildup in the primary system during the fuel cycle by diluting the system with fresh makeup water. When all of the shim bleed distillate is returned to the primary coolant, tritium concentrations could increase above normally expected levels. This has the potential to affect conditions inside containment during shutdown operations, and when the reactor cavity is flooded. The applicant did not describe any impact to these operational conditions and did not address the potential need to dilute the primary coolant prior to refueling outages. The applicant is requested to:

   a. Explain what impact this approach will have on tritium levels in primary coolant, and address why shim bleed processing through liquid effluent discharges would not be a necessary step in controlling tritium levels. If releases were shown to be necessary in controlling tritium levels in system coolant, confirm whether the assumed PWR-GALE Code departure is reasonably conservative in characterizing effluent source terms.

   b. Assess, depending on the evaluation of the above, radiation protection issues and impacts associated with increased tritium levels during various plant evolutions, such as refueling, system downtime, waste volume surges (e.g., late-cycle outages), and on effluent releases during normal operations and anticipated operational occurrences.

2. With respect to noble gases, a review of BBNPP FSAR Table 11.2-3 on gaseous effluents indicates decreases in activity levels for Kr-85 (91.76%), Xe-131m (22.86%), Xe-133m (5.56%), and Xe-133 (16.28%). A change in shim bleed recycling is expected to account for some of the decreases in most noble gas activity levels. However, the calculated data do not explain why Kr-85 would decrease. The long half-life of Kr-85 (10. 7 yr) and its limited holdup time (1.7 days) in the gas delay beds should result in little to no change of activity levels. The applicant did not explain the direction and magnitude of changes in activity levels. The applicant is requested to:

   a. Describe the process leading to changes in activity levels for the radionuclides listed in BBNPP FSAR Table 11.2-3.

   b. Confirm whether the containment low volume purge rate of 2970 CFM is correct in BBNPP FSAR Table 11.2-1, given that U.S. EPR FSAR Table 11.2-3 applies a value of 3210 CFM.

   c. Confirm that BBNPP's analysis applied the same assumption on the number of yearly containment high volume purges as that stated in U.S. EPR FSAR Table 11.2-3.

3. With respect to liquid effluents, a review of BBNPP FSAR Table 11.2-2 indicates increases in activity levels for Co-58 (6.7%), Na-24 (1.6%), W-187 (2.2%), Te-131m (3.2%), La-140 (1.3%), and Ce-143 (1.6%), and a decrease for I-133 (2.9%). A change in shim bleed recycling is expected to account for some decreases in releases. However, the calculated data does not explain why the activity of relatively shorter-lived radionuclides would increase, ranging from 15 to

40 hrs for all with the exception of Co-58 (71 days). The applicant did not explain the direction and magnitude of such changes in activity levels. The applicant is requested to:

a. Describe the process leading to changes in activity levels for the radionuclides listed in BBNPP FSAR Table 11.2-2.

b. Confirm whether the “Ru-103m” entry in BBNPP FSAR Table 11.2-2 should be changed to “Rh-103m” instead.

For all of the above, the applicant is requested to describe in its response and revisions of BBNPP FSAR Tier 2, Section 11.2.3, the methodology, assumptions and default parameters used in revising the source terms, and updating offsite effluent concentrations and dose results accordingly. The applicant should provide sufficient information to enable the staff to conduct an independent evaluation of the revised source terms and offsite effluent concentrations, doses to members of the public and populations, and confirm the results and conclusions of regulatory compliance presented by the applicant in BBNPP FSAR Tier 2, Section 11.2.3 using SRP Section 11.2; RG 1.206, 1.109, 1.111, and 1.113; and the PWR-GALE computer code (NUREG-0017).

**Request for Additional Information No. 5420**
SRP Section: 11.03 - Gaseous Waste Management System
Application Section: 11.3.4

QUESTIONS for Health Physics Branch (CHPB)

11.03-1

Section II.D of Appendix I to 10 CFR 50 requires that gaseous radwaste systems for light water cooled nuclear power reactors include all items of reasonably demonstrated technology that when added to the system sequentially and in order of diminishing cost-benefit return can for a favorable cost benefit ratio effect reductions in dose to populations reasonably expected to be within a 50 mile radius of the reactor. NUREG-0800, SRP 11.3 and RG 1.206 require each applicant for a permit to construct and operate a power reactor to provide reasonable assurance that the design objectives for as low as reasonably achievable effluent releases are satisfied by the gaseous radwaste system. The applicant should demonstrate by means of a cost benefit analysis (CBA) that further reductions to cumulative population doses within a 50 mile (80 km) radius cannot be effected at an annual cost of $1,000 per person-rem (or person-thyroid-rem) for a particular case/additional technology.
SRP 11.3 and RG 1.206 refer to Regulatory Guide 1.110 as providing acceptable methods for performing a CBA. The cost-benefit analysis presented by the applicant in BBNPP FSAR Tier 2, Section 11.3.4 needs to be reviewed based on independent analysis performed by the NRC staff. As such, the applicant needs to provide a complete evaluation including methodology used, components considered, and all assumptions and parameters used.

BBNPP has referenced the Environmental Report Section 5.4 as providing the detailed assumptions used in determining the base case and augmented radwaste system analysis, rather than providing the information as part of BBNPP FSAR Section 11.3, as noted in SRP Section 11.3 and RG 1.206. BNPP ER Section 5.4.3 provides reference back to ER Section 3.5 for data input to GALE code and GASPAR code calculations. However, there is some information and parameters missing or in question that was not provided as part of the applicant's analysis, the applicant is requested to review the staff's observations and revise FSAR Tier 2, Section 11.3.4 accordingly. The applicant is requested to:

1. Verify the cost data presented in FSAR Table 11.3-2 so that it matches the description in FSAR Section 11.3.4. Provide the assumed values for "Total O&M" as it applies values other than given in RG 1.110, Tables A-2 and A-3.

2. Consider another CBA case that includes a system augmentation applying a HEPA/charcoal filtration system for particulates and radioiodines. In FSAR Section 11.3.4, the last paragraph acknowledges that sources of airborne radioactivity from building ventilation systems do not benefit from the holdup afforded by the additional charcoal delay tank as a system augmentation. The sources of radioactivity from plant buildings is characterized as being significantly higher than the source term processed and treated via the gaseous waste processing system. For the gaseous effluent source term shown in U.S. EPR FSAR Table 11.3-3, the radioiodine source term is two to three orders of magnitude higher than any of the particulate radionuclides, and the particulate source term, in the aggregate, is comparable to that of I-131 or I-132. The applicant is requested to evaluate the source term presented in U.S. EPR FSAR Table 11.3-3 and update the assumptions for the base and alternate cases and CBA results presented in FSAR Tables 11.3-1 and 11.3-2.

3. Clearly indicate in the description of the CBA presented in FSAR 11.3.4 which sections of the FSAR are referred to for input data for the CBA, including the full set $\chi/Q$ and D/Q values used in the analysis to calculate population doses in each wind sector out to 50 miles (80 km) using RG 1.109 and the GASPAR II computer code.

4. Provide references supporting the listed population distributions and production rates for milk, beef, poultry, grain, and vegetables within the 50-mile (80 km) radius for the food production data presented in BBNPP ER Tables 5.4-6 to 5.4-12.

5. Provide the detailed information as required by the NUREG-0800, SRP 11.3 and RG 1-206 that supports the CBA as part of FSAR Section 11.3, supported with appropriate references, to ensure that all assumptions and values applied in the CBA are fully contained in BBNPP FSAR Tier 2, Section 11.3.4.

6. In determining whether the system augmentation complies with Section II.D of Appendix I to 10 CFR Part 50, the methodology summarized in FSAR Section 11.3.4 and FSAR Table 11.3-2 describes a process other than noted in RG 1.110, Regulatory Position C.5 and Appendix A, while stating in FSAR Section 11.3.4 that the method applies RG 1.110. The applicant is requested to describe the equivalency the method applied in the BBNPP FSAR or revise it accordingly.

7. The applicant is requested to describe in its response and revisions of FSAR Section 11.3.4 the methodology, assumptions, and provide the supporting information and applied data to enable the staff to conduct an independent evaluation of the CBA and confirm the results and conclusions presented by the applicant in BBNPP FSAR Tier 2, Section 11.3.4 using RG 1.109 and RG 1.110, and the GASPAR II computer code.

**Request for Additional Information No. 5422**
SRP Section: 11.03 - Gaseous Waste Management System
Application Section: 11.3

11.03-2

BBNPP FSAR Tier 2, Rev. 2, Section 11.3.3 presents information on gaseous effluent releases and doses to members of the public by incorporating by reference the corresponding FSAR sections of the U.S. EPR design certification. A comparison of the information presented in BBNPP FSAR Tier 2, Rev. 2, Sections 11.3.2, 2.3.5, and 2.1.1.3, and FSAR Figure 2.1-1 indicates that the information presented in the corresponding sections of the U.S. EPR is different and inconsistent with the characteristics of the Bell Bend site used in confirming compliance with NRC regulations and guidance. Specifically, the following observations were noted:

a. BBNPP FSAR Tier 2, Section 11.3.3 does not address site-specific conditions in confirming that routine gaseous effluent releases will comply with Part 20 (Appendix B, Table 2, Column 1) gaseous effluent concentration limits. The BBNPP FSAR should compare all assumptions used in Section 11.3 of the U.S. EPR Tier 2 FSAR and identify conditions and assumptions that are applicable to the Bell Bend site and, for those that are not, provide site specific parameters with appropriate justifications. A review of U.S. EPR, Rev. 2, FSAR Tier 2, Section 11.3.3 and Tables 11.3-4 and 11.3-7 indicates that dose results are based on different assumptions. Such differences include locations and distances for the nearest garden; nearest animal (milk and meat) and nearest resident; different atmospheric dispersion and deposition parameters (EAB and dose receptors); different annual vegetable and grain production rates within 50 miles of the site; sectors with no residents; different 50-mile population projections; and the U.S. EPR FSAR Tier 2, Section 11.3.3 provides a set atmospheric dispersion and deposition parameters based on a different set of conditions.

b. In BBNPP FSAR Tier 2, Section 11.3.3, the applicant has not included a comparative analysis to confirm that the assumptions and parameters used in dose modeling

described in the U.S. EPR Rev. 2, FSAR, Tier 2, Section 11.3.3 apply to the specific conditions of the Bell Bend site, including confirmation of offsite dose receptors based on the current land-use census. In addition, Sections 5.4.1 and 5.4.2 of the BBNPP ER presents assumptions and parameters that are different than that describe in Section 11.3.3 of the U.S. EPR FSAR. As a result, the description of the gaseous effluent discharges and site-specific conditions are different for BBNPP than that described in the U.S. EPR FSAR. Consequently, the staff concludes that the regulatory compliance analyses presented in U.S. EPR FSAR Rev. 1, Section 11.3 cannot be incorporated by reference in BBNPP FSAR Tier 2, Section 11.3.3 as a substitute assessment of radiological impacts associated with gaseous effluent releases and compliance with NRC regulations and guidance.

c. BBNPP communications to the NRC (BNP-2010-117) describes the change in the location of the nuclear power block on the site; however, FSAR Section 11.3 on gaseous effluent releases has not been revised to reflect such changes and address the associated impacts on offsite effluent concentrations and doses. In addition, BBNPP communications BNP-2010-176 and BNP-2010-276 identified changes to nearby population distributions. Any changes to the location of the nuclear power block on the site or changes in distances from discharge points to the locations of offsite dose receptors need to be identified and their impacts on the dispersion of effluent discharges and doses to members of the public need to be assessed in demonstrating compliance with Part 20.1301 and 20.1302, Part 20, Appendix B, Table 2 effluent concentration limits, and 40 CFR Part 190 as implemented under 10 CFR 20.1301(e).

In light of the above, the applicant is requested to evaluate the following and revise the BBNPP FSAR Tier 2, Section 11.3 accordingly. The applicant is requested to:

1. Present in FSAR Tier 2, Section 11.3 the descriptions of Bell Bend site-specific features with cited references used to estimate doses to members of the public and populations, including descriptions of offsite dose receptors and exposure pathways based on the results of the current land-use census; locations and distances of dose receptors and exposure pathways from BBNPP if different than specifically referred to in BBNPP FSAR Tier 2,Section 2.3.5; sources and estimates of direct radiation exposures from BBNPP building and facilities and materials to members of the public; annual average atmospheric dispersion and deposition parameters for all identified offsite dose receptors and populations within a 50-mile (80 km) radius of BBNPP; assumptions used in calculating doses to maximally exposed individuals and collective population doses; and site-specific and default parameters used to calculate doses using Regulatory Guides 1.109 and 1.111 and the GASPAR II computer code (NUREG/CR-4653).

2. Apply Bell Bend site-specific information, revise BBNPP FSAR Tier 2, Section 11.3.3 and describe the evaluation and present results specific to BBNPP that demonstrates compliance with the effluent concentration limits of Part 20 (Appendix B, Table 2, Column 1); unity rule using the sum-of-the-ratios for all identified radionuclides; and dose limits to members of the public under Parts 20.1301 and 20.1302; Part 20.1301(e) in complying with 40 CFR Part 190 for all exposure pathways; and each design objective of Sections II.B and II.C of Appendix I to Part

50 for dose receptors based on the current land-use census, default parameters, and other assumptions.

3. Providing description of any changes to BBNPP Section 11.3 as a result of the relocation of the nuclear power block on the site. This description should include any changes to effluent release heights for the plant vent and vents from other buildings, changes in atmospheric dispersion and deposition parameters, changes in distances from discharge points to the locations of offsite dose receptors and populations, and resulting changes in dose consequences to members of the public.

For all of the above, the applicant is requested to describe in its response and revisions of FSAR Section 11.3, the methodology, assumptions and default parameters, revised atmospheric dispersion and deposition parameters, site-specific information on dose receptor locations, exposure pathways, and updated offsite effluent concentrations and dose results. The applicant should provide sufficient information to enable the staff to conduct an independent evaluation of offsite effluent concentrations, doses to members of the public and populations, and confirm the results and conclusions of regulatory compliance presented by the applicant in BBNPP FSAR Tier 2, Section 11.3 using RG 1.109 and RG 1.111, and the GASPAR II computer code (NUREG/CR-4653).