

Bell Bend Nuclear Power Plant

Combined License Application

Part 7: Departures and Exemption Requests

Revision 1

This COLA Part is completely site-specific and brackets ({}) are not used.

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Revision History

Revision 1	Incorporates LBDCR-09-0025, which replaces Part 4 Technical Specifications, with a discussion of differences from the Generic Technical Specifications. The differences collapse down in to providing information to delete or replace reviewer's notes in the GTS.
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1.0 DEPARTURES AND EXEMPTION REQUESTS

1.1 DEPARTURES

This Departure Report includes deviations in the BBNPP COL application FSAR from the information in the U.S. EPR FSAR, pursuant to 10 CFR Part 52. The U.S. EPR Design Certification Application is currently under review with the NRC. However, for the purposes of evaluating these deviations from the information in the U.S. FSAR, the guidance provided in Regulatory Guide 1.206, Section C.IV.3.3, has been utilized.

The following Departures are described and evaluated in detail in this report:

1. Maximum Ground Water Level
2. Exclusion Area Boundary
3. Maximum Annual Average Atmospheric Dispersion Factor (0.5 Mile – Limiting Sector)
4. Accident Atmospheric Dispersion Factor (0-2 Hour, 2-8 Hour, And 8-24 Hour Low Population Zone, 1.5 Miles, and 0-2 Hour Exclusion Area Boundary, 0.5 Miles)
5. Estimated Annual Radioactive Liquid and Gaseous Releases
6. Response to Safe Shutdown Earthquake (SSE)
7. In-structure Response Spectra (ISRS)
8. Idealized Site Soil Profiles

1.1.1 MAXIMUM GROUND WATER LEVEL

1.1.1.1 **Affected U.S. EPR FSAR Sections: Tier 1 Table 5.0-1, Tier 2 Table 2.1-1, Tier 2 Section 3.8.4.3.1**

1.1.1.2 **Summary of Departure:**

The U.S. EPR FSAR identifies a maximum groundwater level of 3.3 ft (1.0 m) below grade. The Essential Service Water Emergency Makeup System Pumphouse has a maximum groundwater level that is less than 3.3 ft (1.0 m) below grade.

1.1.1.3 **Scope/Extent of Departure:**

This Departure is identified in BBNPP FSAR Table 2.0-1, Section 2.4.12.5, Section 3.4.2 and Section 3.4.3.

1.1.1.4 **Departure Justification:**

The post construction groundwater level for the Essential Service Water Emergency Makeup System Pumphouse is calculated to be 3.0 ft (0.9 m) below finished grade, or 0.3 ft (0.09 m) above the U.S. EPR FSAR site parameter value of 3.3 ft (1.0 m) below grade.

For the Essential Service Water Emergency Makeup System Pumphouse, separate foundation design calculations were performed for both the U.S. EPR FSAR and BBNPP specific groundwater levels, as discussed in BBNPP FSAR Section 3.8.5.5.4. The results show the Essential Service Water Emergency Makeup System Pumphouse soil bearing pressures and basemat design moments remain within allowable values for both groundwater levels.

1.1.1.5 Departure Evaluation:

This Departure, associated with the maximum groundwater level for the Essential Service Water Emergency Makeup System Pumphouse has been evaluated and determined to not adversely affect the safety function of these structures. Accordingly, this Departure does not:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the plant-specific FSAR;
2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component (SSC) important to safety and previously evaluated in the plant-specific FSAR;
3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the plant-specific FSAR;
4. Result in more than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the plant-specific FSAR;
5. Create a possibility for an accident of a different type than any evaluated previously in the plant-specific FSAR;
6. Create a possibility for a malfunction of an SSC important to safety with a different result than any evaluated previously in the plant-specific FSAR;
7. Result in a design basis limit for a fission product barrier as described in the plant-specific FSAR being exceeded or altered; or
8. Result in a departure from a method of evaluation described in the plant-specific FSAR used in establishing the design bases or in the safety analyses.

This Departure does not affect resolution of a severe accident issue identified in the plant-specific FSAR.

Therefore, this Departure has no safety significance. |

1.1.2 EXCLUSION AREA BOUNDARY |**1.1.2.1 Affected U.S. EPR FSAR Sections: Tier 1 Table 5.0-1, Tier 2 Table 2.1-1, Tier 2 Sections 2.1 and 15.0.3****1.1.2.2 Summary of Departure:**

The U.S. EPR FSAR identifies the Exclusion Area Boundary (EAB) is 0.50 mi (0.8 km). The BBNPP identifies a site-specific EAB as 0.43 mi (0.69 km) which is less than the U.S. EPR FSAR value.

1.1.2.3 Extent/Scope of Departure:

This Departure is identified in BBNPP FSAR Table 2.0-1 and Sections 2.1 and 15.0.3.

1.1.2.4 Departure Justification:

This departure is justified by using the site specific Accident Atmospheric Dispersion Factors listed in Table 15.0-1 to calculate BBNPP doses at the EAB resulting from the design basis accident scenarios specified in U.S. EPR FSAR Section 15.0.3. In each case, the resulting EAB doses were determined to be below the regulatory limits, thus justifying the departure.

1.1.2.5 Departure Evaluation:

This Departure, associated with the BBNPP EAB that is less than the required 0.5 mi (0.8 km) specified in the US EPR FSAR, does not result in offsite doses that exceed regulatory limits. In addition, this departure does not lead to any changes in the plant design. Therefore this Departure has been evaluated and determined to not adversely affect the safety function of the safety related structures. Accordingly, the Departure does not:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the plant-specific FSAR;
2. Result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component (SSC) important to safety and previously evaluated in the plant-specific FSAR;
3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the plant-specific FSAR;
4. Result in more than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the plant-specific FSAR;
5. Create a possibility for an accident of a different type than any evaluated previously in the plant-specific FSAR;
6. Create a possibility for a malfunction of an SSC important to safety with a different result than any evaluated previously in the plant-specific FSAR;
7. Result in a design basis limit for a fission product barrier as described in the plant specific FSAR being exceeded or altered; or
8. Result in a departure from a method of evaluation described in the plant-specific FSAR used in establishing the design bases or in the safety analyses.

This Departure does not affect resolution of a severe accident issue identified in the plant-specific FSAR.

Therefore, this Departure has no safety significance.

1.1.3 MAXIMUM ANNUAL AVERAGE ATMOSPHERIC DISPERSION FACTOR (0.5 MILE – LIMITING SECTOR)**1.1.3.1 Affected U.S. EPR FSAR Sections: Tier 2 Table 2.1-1 and Section 2.3.5****1.1.3.2 Summary of Departure:**

The U.S. EPR FSAR identifies the Maximum Annual Average Atmospheric Dispersion Factor (0.5 mi (0.8 km))– limiting sector) of $\leq 4.973E-6 \text{ sec/m}^3$. The corresponding BBNPP value is $4.062E-05 \text{ sec/m}^3$, as referenced in BBNPP FSAR Table 2.3-157, BBNPP Normal Effluent Annual Average, Undecayed, Undepleted χ/Q Values for Mixed Mode Release Using 242,458 cfm Flow Rate for Site Boundary Receptors, at the N Sector at 0.2 mi (0.32 km).

1.1.3.3 Scope/Extent of Departure:

This Departure is identified in BBNPP FSAR Table 2.0-1 and Section 2.3.5.

1.1.3.4 Departure Justification:

A review of BBNPP Environmental Report, Table 5.4-13, "Distance to Nearest Gaseous Dose Receptors," indicates that the N sector of the Exclusion Area Boundary (EAB) (0.43 mi (0.69 km) radius centered on Reactor Building) intersects with the Site Area Boundary (0.20 mi (0.32 km)) at the northern point of the site boundary. The Maximum Annual Average Atmospheric Dispersion Factor (χ/Q) value is computed at 0.43 mi (0.69 km) which is located approximately 0.23 mi (0.37 km) beyond the site boundary inside the modular laydown and assembly area within the BBNPP property. As presented in BBNPP FSAR Table 2.3-157, the other sectors' annual average χ/Q values which exceed the U.S. EPR value beyond the site boundary are located in the modular laydown and assembly area in the NNW sector, in the construction parking lot in the NW sector, in the owner controlled area in the SW and WSW sectors, and in the site area in the NE and NNE sectors. The remaining sectors are bounded by the Maximum Annual Average χ/Q value provided in U.S. EPR FSAR Table 2.1-1.

Although the Maximum Annual Average χ/Q values for BBNPP exceed the χ/Q limiting value specified in Table 2.1-1 of the U.S. EPR FSAR, operation of BBNPP is justified for the following reasons:

- ◆ There are no persons currently living within the EAB or on its boundary in the N sector (i.e., persons will not be living within the sector of the Maximum Annual Average χ/Q value).
- ◆ The boundary of the EAB in the N sector lies in the modular laydown and assembly area of the owner property. Therefore, because PPL Bell Bend, LLC owns the property, there will not be any residents living in this area.
- ◆ The BBNPP will have control over the point in the N sector at which EAB and the Site Boundary intersect.
- ◆ Sectors' NNW, NW, WSW, SW, NE, and NNE where the maximum annual average χ/Q values exceed the limiting value specified in Table 2.1-1 of the U.S. EPR are inside the owner controlled area and no person will be living in these sectors. Therefore, because PPL Bell Bend, LLC owns the property, there will be no residents living in this area.
- ◆ All other sectors are within the limiting value specified in Table 2.1-1 of the U.S. EPR FSAR.

Therefore, dose limits of 10 CFR 50 Appendix I for the maximally exposed individual will not be exceeded.

1.1.3.5 Departure Evaluation:

This Departure, associated with the Maximum Annual Average Atmospheric Dispersion Factor (χ/Q), does not result in dose limits of 10 CFR 50 Appendix I for the maximally exposed individual being exceeded. Therefore this Departure does not:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the plant-specific FSAR;
2. Result in more than a minimal increase in the likelihood of occurrence of malfunction of a structure, system, or component (SSC) important to safety and previously evaluated in the plant-specific FSAR;
3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the plant-specific FSAR;

4. Result in more than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the plant-specific FSAR;
5. Create a possibility for an accident of a different type than any evaluated previously in the plant-specific FSAR;
6. Create a possibility for a malfunction of an SSC important to safety with a different result than any evaluated previously in the plant-specific FSAR;
7. Result in a design basis limit for a fission product barrier as described in the plant-specific FSAR being exceeded or altered; or
8. Result in a departure from a method of evaluation described in the plant-specific FSAR used in establishing the design bases or in the safety analyses.

This Departure does not affect resolution of a severe accident issue identified in the plant-specific FSAR.

Therefore, this Departure has no safety significance.

1.1.4 ACCIDENT ATMOSPHERIC DISPERSION FACTOR (0-2 HOUR, 2-8 HOUR, AND 8-24 HOUR LOW POPULATION ZONE, 1.5 MILES, AND 0-2 HOUR EXCLUSION AREA BOUNDARY, 0.5 MILES)

1.1.4.1 Affected U.S. EPR FSAR Sections: Tier 1 Table 5.0-1, Tier 2 Table 2.1-1, Section 2.3.4, and Section 15.0.3

1.1.4.2 Summary of Departure:

There are 4 departures with the U.S. EPR FSAR provided in the following discussion. The U.S. EPR FSAR identifies the 0-2 hour, 2-8 hour, and 8-24 hour Accident Atmospheric Dispersion Factor (Low Population Zone, 1.5 mi (2.4 km)) as $\leq 1.75\text{E-}4 \text{ sec/m}^3$, $\leq 1.35\text{E-}4 \text{ sec/m}^3$, and $\leq 1.00\text{E-}4 \text{ sec/m}^3$, respectively. The corresponding BBNPP values are $2.766\text{E-}04 \text{ sec/m}^3$, $1.648\text{E-}04 \text{ sec/m}^3$, and $1.038\text{E-}04 \text{ sec/m}^3$, respectively, as referenced in BBNPP FSAR Table 2.3-147, Site-Specific EAB/LPZ Accident χ/Q Values for Ground Level Releases. The U.S. EPR FSAR identifies the 0-2 hour Accident Atmospheric Dispersion Factor (Exclusion Area Boundary, 0.5 mi (0.8 km)) as $\leq 1.00\text{E-}3 \text{ sec/m}^3$. The corresponding BBNPP value is $1.029\text{E-}3 \text{ sec/m}^3$ (EAB, 0.43 mi (0.69 km)) as referenced in BBNPP FSAR Table 2.3-148, Site-Specific EAB/LPZ Accident χ/Q Values for Ground Level Releases.

1.1.4.3 Scope/Extent of Departure:

This Departure is identified in BBNPP FSAR Table 2.0-1, Table 2.3-148 and Table 15.0-1.

1.1.4.4 Departure Justification:

The site specific Accident Atmospheric Dispersion Factors, including the Low Population Zone 0-2 hour, 2-8 hour, and 8-24 hour at 1.5 mi (2.4 km) χ/Q , and the 0-2 hour Exclusion Area Boundary at 0.43 mi (0.69 km) χ/Q , were used in the calculation of site-specific doses resulting from the design basis accident scenarios specified in U.S. EPR FSAR Section 15.0.3. In each case, the resulting Low Population Zone and Exclusion Area Boundary doses were determined to be below the regulatory limits.

1.1.4.5 Departure Evaluation:

This Departure, associated with the 0-2 hour, 2-8 hour, and 8-24 hour Accident Atmospheric Dispersion Factors (Low Population Zone, 1.5 mi (2.4 km)), and the 0-2 hour Accident Atmospheric Dispersion Factor, 0.43 mi (0.69 km), does not result in Low Population Zone and Exclusion Area Boundary doses that exceed regulatory limits. Therefore this Departure does not:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the plant-specific FSAR;
2. Result in more than a minimal increase in the likelihood of occurrence of malfunction of a structure, system, or component (SSC) important to safety and previously evaluated in the plant-specific FSAR;
3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the plant-specific FSAR;
4. Result in more than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the plant-specific FSAR;
5. Create a possibility for an accident of a different type than any evaluated previously in the plant-specific FSAR;
6. Create a possibility for a malfunction of an SSC important to safety with a different result than any evaluated previously in the plant-specific FSAR;
7. Result in a design basis limit for a fission product barrier as described in the plant-specific FSAR being exceeded or altered; or
8. Result in a departure from a method of evaluation described in the plant-specific FSAR used in establishing the design bases or in the safety analyses.

This Departure does not affect resolution of a severe accident issue identified in the plant-specific FSAR.

Therefore, this Departure has no safety significance.

1.1.5 ESTIMATED ANNUAL RADIOACTIVE LIQUID AND GASEOUS RELEASES

1.1.5.1 Affected U.S. EPR FSAR Sections: Tier 2 Section 11.2.3.2, and Section 11.3.3.2

1.1.5.2 Summary of Departure:

The U.S. EPR FSAR provides for "realistic" estimates of both radioactive liquids and gaseous effluents resulting from expected (normal) operations of the U.S. EPR. This assessment follows the guidance in NUREG-0800 and Regulatory Guide 1.206 in the use of the GALE code (except for C¹⁴) for estimating the annual radioactivity expected to be released. This departure from the information provided in the U.S. EPR FSAR required BBNPP to provide additional information to estimate annual effluent releases. The departure (1) provides estimates of effluent releases that are closer to the expected operating conditions of the U.S. EPR than the conservative conditions noted in the U.S. EPR FSAR, and (2) provides for an updated estimate (higher total radioactivity) of the Carbon-14 release in gaseous effluents than is given by the GALE code based on larger plant size and the relationship of power level and the production of Carbon-14.

1.1.5.3 Scope/Extent of Departure:

This Departure is identified in BBNPP FSAR Section 11.2.3.2 and 11.3.3.2. Table 11.2-1 provides the full listing of GALE input parameters used to estimate both liquid and gaseous effluent releases, including the changes to input parameters for shim bleed flow rate, process time, and recycle of water. Tables 11.2-4 and 11.3-3 provide a full listing of the isotopic releases in liquid and gaseous effluents for both the changes in input assumptions and the replacement of the GALE output of Carbon-14.

1.1.5.4 Departure Justification:

The BBNPP departure from the shim bleed flow and recycle assumptions of the U.S. EPR FSAR cause the noble gas effluents estimates to be lower (more realistic) than reported in the U.S. EPR FSAR. The change in the Carbon-14 release estimate is a departure from the approved GALE code input assumptions, but provides for a higher radioactivity estimate than the GALE code based on an expected increase in the total Carbon-14 production due to the large power level of the U.S. EPR compared to the size of the plants included in the development of the fixed production values programmed into GALE. These changes do not exceed regulatory limits on effluent concentrations in unrestricted areas or doses to members of the public.

1.1.5.5 Departure Evaluation:

This departure from the U.S. EPR FSAR and regulatory guidance provided in NUREG-0800 does not result in offsite doses that exceed regulatory limits. In addition, this departure does not lead to any changes in the U.S. EPR or radioactive waste management equipment design or capability. The estimation of "realistic" annual effluent releases has no safety related or accident consequence features associated with its estimation or use. Therefore, this Departure does not:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the plant-specific FSAR;
2. Result in more than a minimal increase in the likelihood of occurrence of malfunction of a structure, system, or component (SSC) important to safety and previously evaluated in the plant-specific FSAR;
3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the plant-specific FSAR;
4. Result in more than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the plant-specific FSAR;
5. Create a possibility for an accident of a different type than any evaluated previously in the plant-specific FSAR;
6. Create a possibility for a malfunction of an SSC important to safety with a different result than any evaluated previously in the plant-specific FSAR;
7. Result in a design basis limit for a fission product barrier as described in the plant-specific FSAR being exceeded or altered; or
8. Result in a departure from a method of evaluation described in the plant-specific FSAR used in establishing the design bases or in the safety analyses.

This Departure does not affect resolution of a severe accident issue identified in the plant-specific FSAR.

Therefore, this Departure has no safety significance.

1.1.6 RESPONSE TO SAFE SHUTDOWN EARTHQUAKE (SSE)**1.1.6.1 Affected U.S. EPR FSAR Sections: Tier 1 Table 5.0-1 and Tier 2 Sections 2.0, 3.7.1, 3.10, Appendix 3C, and Attachment E to Appendix 3D****1.1.6.2 Summary of Departure:**

The U.S. EPR FSAR identifies the SSE acceleration as the certified seismic design response spectra (CSDRS) shapes anchored to a peak ground acceleration of 0.3g. The corresponding BBNPP design ground motion response spectra (GMRS) exceeds the CSDRS as identified in FSAR Section 3.7.1 (Table 3.7-2 for vertical and Table 3.7-3 for horizontal). The CSDRS is exceeded by the BBNPP GMRS in both the horizontal and vertical directions. The GMRS/FIRS for both the Emergency Power Generating Buildings (EPGBs) and the Essential Service Water Buildings (ESWBs) exceeds the CSDRS. This constitutes a departure from the U.S. EPR FSAR.

1.1.6.3 Scope/Extent of Departure:

This Departure is identified in Part 2 FSAR, Sections 2.0, 2.5.2.6, 3.7.1, 3.10, Appendix 3C, and Attachment E to Appendix 3D.

1.1.6.4 Departure Justification:

This departure is justified using the U.S. EPR FSAR Section 2.5.2.6 seismic reconciliation steps. BBNPP site-specific in-structure response spectra (ISRS) are developed from the BBNPP site-specific ground motion response spectra (GMRS) and soil profiles and are compared with the U.S. EPR design certification ISRS. For most building locations, the BBNPP site-specific ISRS are confirmed to result in the amplitude of the site-specific ISRS not exceeding the ISRS for the U.S. EPR by greater than 10 % in accordance with Step 8 of U.S. EPR FSAR 2.5.2.6. For building locations where the site-specific ISRS exceed the design ISRS by more than 10 %, evaluations of safety-related structures, systems, and components (SSC) were performed in accordance with Step 9 of U.S. EPR FSAR 2.5.2.6. These evaluations are discussed in Section 3.7.1 and confirm the SSCs will perform their safety related functions following an SSE.

1.1.6.5 Departure Evaluation:

This Departure, associated with the SSE, has been evaluated in accordance with the U.S. EPR FSAR Section 2.5.2.6 seismic reconciliation guidelines and determined to not affect the safety function of the safety-related SSCs of the U.S. EPR at the building locations where BBNPP site-specific ISRS exceed the ISRS for the U.S. EPR design certification by more than 10%.

Accordingly, this Departure does not:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the plant-specific FSAR;
2. Result in more than a minimal increase in the likelihood of occurrence of malfunction of a structure, system, or component (SSC) important to safety and previously evaluated in the plant-specific FSAR;
3. Result in more than a minimal increase in the consequences of an accident previously evaluated in the plant-specific FSAR;
4. Result in more than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the plant-specific FSAR;

5. Create a possibility for an accident of a different type than any evaluated previously in the plant-specific FSAR;
6. Create a possibility for a malfunction of an SSC important to safety with a different result than any evaluated previously in the plant-specific FSAR;
7. Result in a design basis limit for a fission product barrier as described in the plant-specific FSAR being exceeded or altered; or
8. Result in a departure from a method of evaluation described in the plant-specific FSAR used in establishing the design bases or in the safety analyses.

This Departure does not affect resolution of a severe accident issue identified in the plant-specific FSAR.

Therefore, this Departure has no safety significance.

1.1.7 IN-STRUCTURE RESPONSE SPECTRA (ISRS)

1.1.7.1 Affected U.S. EPR FSAR Sections: Tier 2 Section 3.7.1

1.1.7.2 Summary of Departure:

The U.S. EPR FSAR identifies ISRS at representative locations of the NI Common Basemat Structures, EPGB, and ESWB. The corresponding BBNPP ISRS are identified in the BBNPP FSAR Section 3.7.1 and represent a departure from the U.S. EPR FSAR.

1.1.7.3 Scope/Extent of Departure:

This Departure is identified in Part 2 FSAR, Sections 2.5.2.6 and 3.7.1.

1.1.7.4 Departure Justification:

This departure is justified using the U.S. EPR FSAR Section 2.5.2.6 seismic reconciliation guidelines. The BBNPP site-specific in-structure response spectra (ISRS) are developed from the BBNPP site-specific ground motion response spectra (GMRS) and soil profiles and are compared with the U.S. EPR design certification ISRS. For most building locations, the BBNPP site-specific ISRS are confirmed to result in the amplitude of the site-specific ISRS not exceeding the ISRS for the U.S. EPR by greater than 10 % in accordance with Step 8 of U.S. EPR FSAR 2.5.2.6. For building locations where the site-specific ISRS exceed the design ISRS by more than 10 %, evaluations of safety-related structures, systems, and components (SSC) were performed in accordance with Step 9 of U.S. EPR FSAR 2.5.2.6. These evaluations are discussed in Section 3.7.1 and confirm the SSCs will perform their safety related functions following an SSE.

1.1.7.5 Departure Evaluation:

This Departure, associated with ISRS, has been evaluated in accordance with the U.S. EPR FSAR Section 2.5.2.6 seismic reconciliation guidelines and determined to not affect the safety function of the safety-related SSCs of the U.S. EPR at the building locations where BBNPP site-specific ISRS exceed the ISRS for the U.S. EPR design certification by more than 10%.

Accordingly, this Departure does not:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the plant-specific FSAR;

2. Result in more than a minimal increase in the likelihood of occurrence of malfunction of a structure, system, or component (SSC) important to safety and previously evaluated in the plant-specific FSAR;
3. Result in more than a minimal increase in the consequences of an accident previously Result in more than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the plant-specific FSAR;
4. Create a possibility for an accident of a different type than any evaluated previously in the plant-specific FSAR;
5. Create a possibility for a malfunction of an SSC important to safety with a different result than any evaluated previously in the plant-specific FSAR;
6. Result in a design basis limit for a fission product barrier as described in the plant-specific FSAR being exceeded or altered; or
7. Result in a departure from a method of evaluation described in the plant-specific FSAR used in establishing the design bases or in the safety analyses.

This Departure does not affect resolution of a severe accident issue identified in the plant-specific FSAR.

Therefore, this Departure has no safety significance.

1.1.8 IDEALIZED SITE SOIL PROFILES

1.1.8.1 Affected U.S. EPR FSAR Sections: Tier 2 Section 3.7.1

1.1.8.2 Summary of Departure:

The U.S. EPR FSAR identifies the idealized site soil profile as the U.S. EPR design certification 10 generic soil profiles. The corresponding idealized BBNPP site soil profile is identified in the BBNPP FSAR Section 3.7.1. The range of shear wave velocities of the BBNPP strain-compatible soil profiles has variations in the soil layering at the site from that of the generic soil profiles considered in the U.S. EPR FSAR. These variations constitute a single departure.

1.1.8.3 Scope/Extent of Departure:

This Departure is identified in Part 2 FSAR, Sections 2.5.2.6 and 3.7.1.

1.1.8.4 Departure Justification:

This departure is justified using the U.S. EPR FSAR Section 2.5.2.6 seismic reconciliation guidelines. BBNPP site-specific in-structure response spectra (ISRS) are developed from the BBNPP site-specific ground motion response spectra (GMRS) and soil profiles and are compared with the U.S. EPR design certification ISRS. For most building locations, the BBNPP site-specific ISRS are confirmed to result in the amplitude of the site-specific ISRS not exceeding the ISRS for the U.S. EPR by greater than 10% in accordance with Step 8 of U.S. EPR FSAR 2.5.2.6. For building locations where the site-specific ISRS exceed the design ISRS by more than 10%, evaluations of safety-related structures, systems, and components (SSC) were performed in accordance with Step 9 of U.S. EPR FSAR 2.5.2.6. These evaluations are discussed in Section 3.7.1 and confirm the SSCs will perform their safety related functions following an SSE.

1.1.8.5 Departure Evaluation:

This Departure, associated with the idealized site soil profile, has been evaluated in accordance with the U.S. EPR FSAR Section 2.5.2.6 seismic reconciliation guidelines and determined to not affect the safety function of the safety-related SSCs of the U.S. EPR at the building locations where BBNPP site-specific ISRS exceed the ISRS for the U.S. EPR design certification by more than 10%. Accordingly, this Departure does not:

1. Result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the plant-specific FSAR;
2. Result in more than a minimal increase in the likelihood of occurrence of malfunction of a structure, system, or component (SSC) important to safety and previously evaluated in the plant-specific FSAR;
3. Result in more than a minimal increase in the consequences of an accident previously Result in more than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the plant-specific FSAR;
4. Create a possibility for an accident of a different type than any evaluated previously in the plant-specific FSAR;
5. Create a possibility for a malfunction of an SSC important to safety with a different result than any evaluated previously in the plant-specific FSAR;
6. Result in a design basis limit for a fission product barrier as described in the plant-specific FSAR being exceeded or altered; or
7. Result in a departure from a method of evaluation described in the plant-specific FSAR used in establishing the design bases or in the safety analyses.

This Departure does not affect resolution of a severe accident issue identified in the plant-specific FSAR.

Therefore, this Departure has no safety significance.

1.2 EXEMPTION REQUESTS

These exemption requests have been developed assuming approval and issuance of a design certification for the U.S. EPR and are based on the current version of the U.S. EPR FSAR.

PPL Bell Bend, LLC requests the following exemptions related to:

1. Maximum Ground Water Level,
2. Exclusion Area Boundary,
3. Maximum Annual Average Atmospheric Dispersion Factor (0.5 Mile – Limiting Sector),
4. Accident Atmospheric Dispersion Factor (0-2 Hour, 2-8 Hour, And 8-24 Hour Low Population Zone, 1.5 Miles, and 0-2 Hour Exclusion Area Boundary, 0.5 Miles)
5. Safe Shutdown Earthquake (SSE),
6. Fitness For Duty Program,
7. Use of M5™ Advanced Zirconium Alloy Fuel Rod Cladding,
8. Dedicated Containment Penetrations
9. Use of 2004 Edition of the ASME Code

The exemption requests associated with Use of M5™ Advanced Zirconium Alloy Fuel Rod Cladding, Dedicated Containment Penetrations, and Use of 2004 Edition of the ASME Code are the same as those previously requested by AREVA in support of the U.S. EPR Design Certification Application.

Discussion and justification for each of the above exemption requests are provided in the following pages.

1.2.1 MAXIMUM GROUND WATER LEVEL

1.2.1.1 Applicable Regulation: 10 CFR Part 52

The U.S. EPR FSAR Tier 1 Table 5.0-1, Tier 2 Table 2.1-1, and Tier 2 Section 3.8.4.3.1 identify a maximum groundwater level of 3.3 ft (1.0 m) below grade. The Essential Service Water Emergency Makeup System Pump House has a maximum groundwater level that is less than 3.3 ft (1.0 m) below grade.

Pursuant to 10 CFR 52.7 and 10 CFR 52.93, PPL Bell Bend, LLC requests an exemption from compliance with the U.S. EPR FSAR Tier 1 and 2 requirements associated with the maximum ground water level.

1.2.1.2 Discussion:

The post construction groundwater level for the Essential Service Water Emergency Makeup System (ESWEMS) Pump House is calculated to be 3.0 ft (0.9 m) below finished grade, or 0.3 ft (0.09 m) above the U.S. EPR FSAR site parameter value of 3.3 ft (1.0 m) below grade.

For the Essential Service Water Emergency Makeup System Pump House, separate foundation design calculations were performed for both the U.S. EPR FSAR and BBNPP specific groundwater levels, as discussed in BBNPP FSAR Section 3.8.5.5.3. The results show the Essential Service Water Emergency Makeup System Pump House soil bearing pressures and basement design moments remain within allowable values for both groundwater levels.

The change associated with the maximum groundwater level for the ESWEMS Pumphouse has been evaluated and determined to not adversely affect the safety function of these structures. Therefore, this change will not result in a significant decrease in the level of safety otherwise provided by the design described in the U.S. EPR FSAR.

The exemption is not inconsistent with the Atomic Energy Act or any other statute. As such, the requested exemption is authorized by law.

This change does not result in a departure from the design and does not require a change in the design described in the U.S. EPR FSAR. In addition, the change has been evaluated and determined to not adversely affect the safety function of the associated structures. Therefore, the requested exemption will not present an undue risk to the public health and safety.

The change does not relate to security and does not otherwise pertain to the common defense and security. Therefore, the requested exemption will not endanger the common defense and security.

The special circumstance necessitating the request for exemption is that the BBNPP ESWEMS Pumphouse has groundwater levels that exceed the U.S. EPR FSAR value. However, the BBNPP ground water levels have been evaluated and determined to not adversely affect the safety function of the ESWEMS Pumphouse. As such, application of the regulation for this particular circumstance would not serve the underlying purpose of the rule and is not required to achieve the underlying purpose of the rule.

This requested exemption does not require a change in the design described in the U.S. EPR FSAR. Therefore, this exemption will not result in any loss of standardization.

For these reasons, PPL Bell Bend, LLC requests approval of the requested exemption from compliance with the U.S. EPR FSAR Tier 1 and 2 requirements associated with the maximum ground water level.

1.2.2 EXCLUSION AREA BOUNDARY

1.2.2.1 Applicable Regulation: 10 CFR Part 52

The U.S. EPR FSAR Tier 1 Table 5.0-1, Tier 2 Table 2.1-1, and Tier 2 Sections 2.1 and 15.0.3 identifies the Exclusion Area Boundary (EAB) is 0.50 mi (0.8 km). The BBNPP identifies a site-specific EAB as 0.43 mi (0.69 km) which is less than the U.S. EPR FSAR value.

Pursuant to 10 CFR 52.7 and 10 CFR 52.93, PPL Bell Bend, LLC requests an exemption from compliance with the U.S. EPR FSAR Tier 1 and 2 requirements associated with the EAB.

1.2.2.2 Discussion:

This EAB is discussed in BBNPP FSAR Table 2.0-1 and Sections 2.1 and 15.0.3.

The site-specific EAB is less than the required 0.5 mi (0.8 km) listed in Table 15.0-1. The site-specific atmospheric dispersion factors were used to calculate BBNPP doses at the EAB resulting from the design basis accident scenarios specified in U.S. EPR FSAR Section 15.0.3. In each case, the resulting EAB doses were determined to be below the regulatory limits.

The BBNPP site-specific atmospheric dispersion factors for the EAB exceeding those in the U.S. EPR FSAR do not result in offsite doses that exceed regulatory limits. In addition, this change

does not lead to any changes in the plant design. Therefore, this change has been evaluated and determined to not adversely affect the safety function of these structures. Therefore, this change will not result in a significant decrease in the level of safety otherwise provided by the design described in the U.S. EPR FSAR.

The exemption is not inconsistent with the Atomic Energy Act or any other statute. As such, the requested exemption is authorized by law.

This change does not result in a departure from the design and does not require a change in the design described in the U.S. EPR FSAR. In addition, the change has been evaluated and determined to not adversely affect the safety function of the associated structures. Therefore, the requested exemption will not present an undue risk to the public health and safety.

The change does not relate to security and does not otherwise pertain to the common defense and security. Therefore, the requested exemption will not endanger the common defense and security.

The special circumstance necessitating the request for exemption is that the BBNPP EAB value is less than the U.S. EPR FSAR value. However, the BBNPP EAB has been evaluated and determined to not adversely affect the safety function of these structures. As such, application of the regulation for this particular circumstance would not serve the underlying purpose of the rule and is not required to achieve the underlying purpose of the rule.

This requested exemption does not require a change in the design described in the U.S. EPR FSAR. Therefore, this exemption will not result in any loss of standardization.

For these reasons, PPL Bell Bend, LLC requests approval of the requested exemption from compliance with the U.S. EPR FSAR Tier 1 and 2 requirements associated with the EAB.

1.2.3 **MAXIMUM ANNUAL AVERAGE ATMOSPHERIC DISPERSION FACTOR (0.5 MILE – LIMITING SECTOR)**

1.2.3.1 **Applicable Regulation: 10 CFR Part 52**

The U.S. EPR FSAR Tier 2 Table 2.1-1 and Tier 2 Section 2.3.5 identify the Maximum Annual Average Atmospheric Dispersion Factor (0.5 mi (0.8 km) – limiting sector) of $\leq 4.973\text{E-}6 \text{ sec/m}^3$. The corresponding BBNPP value is $4.062\text{E-}05 \text{ sec/m}^3$, as referenced in BBNPP FSAR Table 2.3-157, BBNPP Normal Effluent Annual Average, Undecayed, Undepleted χ/Q Values for Mixed Mode Release Using 242,458 cfm Flow Rate for Site Boundary Receptors, at the N Sector at 0.2 mi (0.32 km).

Pursuant to 10 CFR 52.7 and 10 CFR 52.93, PPL Bell Bend, LLC requests an exemption from compliance with the U.S. EPR FSAR Tier 1 and 2 requirements associated with the Maximum Annual Average Atmospheric Dispersion Factor (0.5 mi (0.8 km) – limiting sector).

1.2.3.2 **Discussion:**

The U.S. EPR FSAR Tier 2 Table 2.1-1 and Tier 2 Section 2.3.5 identify the Maximum Annual Average Atmospheric Dispersion Factor (0.5 mi (0.8 km) – limiting sector) of $\leq 4.973\text{E-}6 \text{ sec/m}^3$. The corresponding BBNPP value is $4.062\text{E-}05 \text{ sec/m}^3$, as referenced in BBNPP FSAR Table 2.3-157, BBNPP Normal Effluent Annual Average, Undecayed, Undepleted χ/Q Values for Mixed

Mode Release Using 242,458 cfm Flow Rate for Site Boundary Receptors, N Sector at 0.43 mi (0.69 km). This BBNPP specific value exceeds the U.S. EPR FSAR value.

A review of BBNPP Environmental Report, Table 5.4-13, "Distance to Nearest Gaseous Dose Receptors," indicates that the N sector of the Exclusion Area Boundary (EAB) (0.43 mi (0.69 km) radius centered on Reactor Building) intersects with the Site Area Boundary (0.20 mi (0.32 km)) at the northern point of the site boundary. The Maximum Annual Average Atmospheric Dispersion Factor (χ/Q) value is computed at 0.43 mi (0.69 km) which is located approximately 0.23 mi (0.37 km) beyond the site boundary inside the modular laydown and assembly area within the BBNPP property. As presented in BBNPP FSAR Table 2.3-157, the other sectors' annual average χ/Q values which exceed the U.S. EPR value beyond the site boundary are located in the modular laydown and assembly area in the NNW sector, in the construction parking lot in the NW sector, in the owner controlled area in the SW and WSW sectors, and in the site area in the NE and NNE sectors. The remaining sectors are bounded by the Maximum Annual Average χ/Q value provided in U.S. EPR FSAR Table 2.1-1.

Although some of the Maximum Annual Average χ/Q values for BBNPP exceed the χ/Q limiting values specified in Table 2.1-1 of the U.S. EPR FSAR, operation of BBNPP is justified for the following reasons:

- ◆ There are no persons currently living within the EAB or on its boundary in the N sector (i.e., persons will not be living within the sector of the Maximum Annual Average χ/Q value).
- ◆ The boundary of the EAB in the N sector lies in the modular laydown and assembly area of the owner property. Therefore, because PPL Bell Bend, LLC owns the property, there will be no residents living in this area.
- ◆ The BBNPP will have control over the point in the N sector at which EAB and the Site Boundary intersect.
- ◆ Sectors' NNW, NW, WSW, SW, NE, and NNE where the maximum annual average χ/Q values exceed the limiting value specified in Table 2.1-1 of the U.S. EPR are inside the owner controlled area and no person will be living in these sectors. Therefore, because PPL Bell Bend, LLC owns the property, there will be no residents living in this area.
- ◆ All other sectors are within the limiting value specified in Table 2.1-1 of the U.S. EPR FSAR.

Therefore, dose limits of 10 CFR 50 Appendix I for the maximally exposed individual will not be exceeded. As such, these changes will not result in a significant decrease in the level of safety otherwise provided by the design described in the U.S. EPR FSAR.

The exemption is not inconsistent with the Atomic Energy Act or any other statute. As such, the requested exemption is authorized by law.

This change does not result in a departure from the design and does not require a change in the design described in the U.S. EPR FSAR. In addition, a review has been conducted and concludes that dose limits of 10 CFR 50, Appendix I for the maximally exposed individual resulting from the BBNPP specific χ/Q values will not be exceeded. Therefore, the requested exemption will not present an undue risk to the public health and safety.

The change does not relate to security and does not otherwise pertain to the common defense and security. Therefore, the requested exemption will not endanger the common defense and security.

The special circumstance necessitating the request for exemption is that the BBNPP specific value for the Maximum Annual Average Atmospheric Dispersion Factor (0.5 mile – limiting sector) exceeds the U.S. EPR FSAR value. However, the dose limits of 10 CFR 50, Appendix I for the maximally exposed individual resulting from the BBNPP specific χ/Q values will not be exceeded. As such, application of the regulation for this particular circumstance would not serve the underlying purpose of the rule and is not required to achieve the underlying purpose of the rule.

This requested exemption does not require a change in the design described in the U.S. EPR FSAR. Therefore, this exemption will not result in any loss of standardization.

For these reasons, PPL Bell Bend, LLC requests approval of the requested exemption from compliance with the U.S. EPR FSAR Tier 1 and 2 requirements associated with the Maximum Annual Average Atmospheric Dispersion Factor (0.5 mile – limiting sector).

1.2.4 ACCIDENT ATMOSPHERIC DISPERSION FACTOR (0-2 HOUR, 2-8 HOUR, AND 8-24 HOUR LOW POPULATION ZONE, 1.5 MILES, AND 0-2 HOUR EXCLUSION AREA BOUNDARY, 0.5 MILES)

1.2.4.1 Applicable Regulation: 10 CFR Part 52

The U.S. EPR FSAR Tier 1 Table 5.0-1, Tier 2 Table 2.1-1, Tier 2 Section 2.3.4, and Tier 2 Section 15.0.3 identify the 0-2 hour, 2-8 hour, and 8-24 hour Accident Atmospheric Dispersion Factor (Low Population Zone, 1.5 mi (2.4 km)) as $\leq 1.75E-4 \text{ sec/m}^3$, $\leq 1.35E-4 \text{ sec/m}^3$, and $\leq 1.00E-4 \text{ sec/m}^3$, respectively. The corresponding BBNPP values are $2.766E-04 \text{ sec/m}^3$, $1.648E-04 \text{ sec/m}^3$, and $1.038E-04 \text{ sec/m}^3$, respectively, as referenced in BBNPP FSAR Table 2.3-148, Site-Specific EAB/LPZ Accident χ/Q Values for Ground Level Releases. The U.S. EPR FSAR identifies the 0-2 hour Accident Atmospheric Dispersion Factor (Exclusion Area Boundary, 0.5 mi (0.8 km)) as $\leq 1.00E-3 \text{ sec/m}^3$. The corresponding BBNPP value is $1.029E-3 \text{ sec/m}^3$ as referenced in BBNPP FSAR Table 2.3-148, Site-Specific EAB/LPZ Accident χ/Q Values for Ground Level Releases.

Pursuant to 10 CFR 52.7 and 10 CFR 52.93, PPL Bell Bend, LLC requests an exemption from compliance with the U.S. EPR FSAR Tier 1 and 2 requirements associated with the 0-2 hour, 2-8 hour, and 8-24 hour Accident Atmospheric Dispersion Factor (Low Population Zone, 1.5 mi (2.4 km)) and with U.S. EPR FSAR Tier 1 and 2 requirements associated with the 0-2 hour Accident Atmospheric Dispersion Factor (Exclusion Area Boundary, 0.5 mi (0.8 km)).

1.2.4.2 Discussion:

The U.S. EPR FSAR identifies the 0-2 hour, 2-8 hour, and 8-24 hour Accident Atmospheric Dispersion Factor (Low Population Zone, 1.5 mi (2.4 km)) as $\leq 1.75E-4 \text{ sec/m}^3$, $\leq 1.35E-4 \text{ sec/m}^3$, and $\leq 1.00E-4 \text{ sec/m}^3$. The corresponding BBNPP values are $2.766E-04 \text{ sec/m}^3$, $1.648E-04 \text{ sec/m}^3$, and $1.038E-04 \text{ sec/m}^3$, respectively, as referenced in BBNPP FSAR Table 2.3-148, Site-Specific EAB/LPZ Accident χ/Q Values for Ground Level Releases. The U.S. EPR FSAR identifies the 0-2 hour Accident Atmospheric Dispersion Factor (Exclusion Area Boundary, 0.5 mi (0.8 km)) as $\leq 1.00E-3 \text{ sec/m}^3$. The corresponding BBNPP value is $1.029E-3 \text{ sec/m}^3$ as referenced in BBNPP FSAR Table 2.3-148, Site-Specific EAB/LPZ Accident χ/Q Values for Ground Level Releases.

These BBNPP specific values exceed the U.S. EPR FSAR values. As a result, the site specific Accident Atmospheric Dispersion Factors, including the Low Population Zone 0-2 hour, 2-8

hour, and 8-24 hour at 1.5 mi (2.4 km) χ/Q s were used to calculate the site-specific doses resulting from the design basis accident scenarios specified in U.S. EPR FSAR Section 15.0.3. In each case, the resulting Low Population Zone doses (reflected in BBNPP FSAR Chapter 15) were determined to be below the regulatory limits.

Also, as a result, the site specific Accident Atmospheric Dispersion Factors, including the EAB 0-2 hour at 0.43 mi (0.69 km) χ/Q was used to calculate the site-specific dose resulting from the design basis accident scenarios specified in U.S. EPR FSAR Section 15.0.3. In each case, the resulting EAB doses (reflected in BBNPP FSAR Chapter 15) were determined to be below the regulatory limits.

Therefore, these changes will not result in a significant decrease in the level of safety otherwise provided by the design described in the U.S. EPR FSAR.

The exemption is not inconsistent with the Atomic Energy Act or any other statute. As such, the requested exemption is authorized by law.

This change does not result in a departure from the design and does not require a change in the design described in the U.S. EPR FSAR. In addition, the Low Population Zone and EAB doses resulting from the associated BBNPP specific χ/Q values have been determined to be below regulatory limits. Therefore, the requested exemption will not present an undue risk to the public health and safety.

The change does not relate to security and does not otherwise pertain to the common defense and security. Therefore, the requested exemption will not endanger the common defense and security.

The special circumstance necessitating the request for exemption is that the BBNPP specific value for the 0-2 hour, 2-8 hour, and 8-24 hour Accident Atmospheric Dispersion Factor (Low Population Zone, 1.5 mi (2.4 km)) exceeds the U.S. EPR FSAR value. The 0-2 hour Atmospheric Dispersion Factor (EAB, 0.43 mi (0.69 km)) also exceeds the U.S. EPR FSAR value. However, the BBNPP specific Accident Atmospheric Dispersion Factor (Low Population Zone, 1.5 mi (2.4 km) and EAB, 0.43 mi (0.69 km)), do not result in Low Population Zone and EAB doses that exceed regulatory limits. As such, application of the regulation for this particular circumstance would not serve the underlying purpose of the rule and is not required to achieve the underlying purpose of the rule.

This requested exemption does not require a change in the design described in the U.S. EPR FSAR. Therefore, this exemption will not result in any loss of standardization.

For these reasons, PPL Bell Bend, LLC requests approval of the requested exemption from compliance with the U.S. EPR FSAR Tier 1 and 2 requirements associated with the 0-2 hour, 2-8 hour, and 8-24 hour Accident Atmospheric Dispersion Factor (Low Population Zone, 1.5 mi (2.4 km)) and the requirements associated with the 0-2 hour Accident Atmospheric Dispersion Factor (EAB, 0.43 mi (0.69 km)).

1.2.5 SAFE SHUTDOWN EARTHQUAKE (SSE)

1.2.5.1 Applicable Regulation: 10 CFR Part 52

The U.S. EPR FSAR Tier 1 Table 5.0-1 and Tier 2 Sections 2.0 and 3.7.1 identify the SSE acceleration as the certified seismic design response spectra (CSDRS) shapes anchored to a peak ground acceleration of 0.3g. The corresponding BBNPP design ground motion response

spectra (GMRS) exceed the CSDRS as identified in BBNPP FSAR Section 3.7.1 (Table 3.7-2 for vertical and Table 3.7-3 for horizontal). The CSDRS is exceeded by the BBNPP GMRS in both the horizontal and vertical directions. The GMRS/FIRS for both the Emergency Power Generating Buildings (EPGBs) and the Essential Service Water Buildings (ESWBs) exceeds the CSDRS.

Pursuant to 10 CFR 52.7, 10 CFR 50.12 and 10 CFR 52.93, PPL Bell Bend, LLC requests an exemption from compliance with the U.S. EPR FSAR Tier 1 and 2 requirements associated with the SSE.

1.2.5.2 Discussion:

The U.S. EPR FSAR Tier 1 Table 5.0-1 and Tier 2 Sections 2.0 and 3.7.1 identify the SSE acceleration as the CSDRS shapes anchored to a peak ground acceleration of 0.3g. The corresponding BBNPP design GMRS exceed the CSDRS identified in BBNPP FSAR Section 3.7.1 (Table 3.7-2 for vertical and Table 3.7-3 for horizontal). The CSDRS is exceeded by the BBNPP GMRS in both the horizontal and vertical directions. The FIRS for both the EPGBs and the ESWBs exceeds the CSDRS. This departure is justified using the U.S. EPR FSAR Section 2.5.2.6 seismic reconciliation guidelines. BBNPP site-specific in-structure response spectra (ISRS) are developed from the BBNPP site-specific GMRS and soil profiles and are compared with the U.S. EPR design certification ISRS. The BBNPP site-specific ISRS are confirmed to lie within the envelope of the U.S. EPR design certification ISRS or evaluations confirm that safety-related structures, systems, and components of the U.S. EPR at the building locations where BBNPP site-specific ISRS exceed the ISRS for the U.S. EPR design certification by more than 10% are not affected.

The exemption is not inconsistent with the Atomic Energy Act or any other statute. As such, the requested exemption is authorized by law.

This change does not result in a departure from the design and does not require a change in the design described in the U.S. EPR FSAR. In addition, an evaluation has been conducted and concludes that safety-related structures, systems, and components of the U.S. EPR at the building locations where BBNPP site-specific ISRS exceed the ISRS for the U.S. EPR design certification by more than 10% are not affected. Therefore, the requested exemption will not present an undue risk to the public health and safety.

The change does not relate to security and does not otherwise pertain to the common defense and security. Therefore, the requested exemption will not endanger the common defense and security.

Consistent with 10 CFR 50.12(a), a special circumstance is present that requires an exemption in that the BBNPP site-specific GMRS exceed the U.S. EPR CSDRS. Evaluations confirm that safety-related structures, systems, and components of the U.S. EPR at the building locations where BBNPP site-specific ISRS exceed the ISRS for the U.S. EPR design certification by more than 10%. However, evaluations also confirm that this exceedance does not affect the safety related function of the safety-related SSCs of the U. S. EPR. As such, application of the regulation for this particular circumstance would not serve the underlying purpose of the rule and is not required to achieve the underlying purpose of the rule.

This requested exemption does not require a change in the design described in the U.S. EPR FSAR. Therefore, this exemption will not result in any loss of standardization.

For these reasons, PPL Bell Bend, LLC requests approval of the requested exemption from compliance with the U.S. EPR FSAR Tier 1 and 2 requirements associated with the SSE.

1.2.6 FITNESS FOR DUTY PROGRAM

1.2.6.1 Applicable Regulation: 10 CFR 52.79(a)(44)

Specific wording from which a schedule exemption is requested:

(a) The application must contain a final safety analysis report that describes the facility, presents the design bases and the limits on its operation, and presents a safety analysis of the structures, systems, and components of the facility as a whole. The final safety analysis report shall include the following information, at a level of information sufficient to enable the Commission to reach a final conclusion on all safety matters that must be resolved by the Commission before issuance of a combined license:

(44) A description of the fitness-for-duty program required by 10 CFR part 26 and its implementation.

Pursuant to 10 CFR 52.7 and 10 CFR 52.93 PPL Bell Bend, LLC requests a schedule exemption from the requirement of 10 CFR 52.79(a)(44) to provide a "description of the fitness-for-duty program required by 10 CFR 26 and its implementation" in its application for a combined license for BBNPP. PPL Bell Bend, LLC proposes to provide the Fitness for Duty (FFD) Program description required by 10 CFR 52.79(a)(44) at a later date that will support commencement of on-site construction to safety or security-related systems, structures and components, and issuance of the Combined Operating License. This additional time will allow BBNPP to prepare a FFD program that takes advantage of industry experience regarding the implementation of a workable FFD program based on the recently promulgated 10 CFR Part 26 regulations.

1.2.6.2 Discussion:

On March 31, 2008, the Commission promulgated a final rule amending FFD regulations in 10 CFR Part 26 for both the construction and operating phases for a new nuclear plant. This revised rule became effective in April 2008, and is required to be completely implemented by October 2009.

The construction phase of the FFD Program as applied to new plants is not required to be implemented until the commencement of on-site construction for safety or security-related systems, structures and components. PPL Bell Bend, LLC will not begin these activities until the construction FFD Program is in place and the Combined Operating License is issued. PPL Bell Bend, LLC is not requesting a Limited Work Authorization (LWA). The operational phase of the FFD Program is required to be implemented prior to fuel load. Accordingly, PPL Bell Bend, LLC submits a request for a schedule exemption from current Part 52 regulations pursuant to 10 CFR 52.7, "Specific Exemptions," and 10 CFR 52.93, "Exemptions and Variances."

Granting this request, which is authorized by law, would allow the NRC to conduct its acceptance review of the BBNPP COL Application based on the revised rules. PPL Bell Bend, LLC does not expect the NRC to issue the requested COL until the revised FFD rules are required to be fully implemented. For this and other reasons, granting this exemption request will not present an undue risk to the public health and safety, and is consistent with the common defense and security.

The timing of the need for a construction FFD Program, and an operations FFD Program create "special circumstances," as defined in 10 CFR 50.12, "Specific exemptions," that warrant granting this exemption. Requiring the submittal of a FFD description at this time would not serve, and is not necessary to achieve, the underlying purpose of 10 CFR 52.79(a)(44). This purpose can be

satisfied by allowing PPL Bell Bend, LLC additional time to develop an effective FFD program, similar to the time allowed by the rule for operating plants. PPL Bell Bend, LLC will submit the description of the FFD program in sufficient time to implement the FFD program to support the applicable construction activities and issuance of the Combined Operating License.

Moreover, submittal of the description of the FFD Program at this time would cause undue hardship for PPL Bell Bend, LLC and would also be inefficient and burdensome for the NRC staff. Over the next year, the NRC staff, the operating plants, and earlier COL applicants will develop revised FFD programs that satisfy the requirements of the recently issued rule. PPL Bell Bend, LLC will draw on industry experience to the extent possible to prepare a FFD program in a more effective manner, which will permit a more efficient NRC review of the same.

For these reasons, PPL Bell Bend, LLC requests approval of the requested schedule exemption from the 10 CFR 52 requirements to provide a description (in the FSAR) of the FFD program that meets the 10 CFR 26 Fitness for Duty regulations.

1.2.7 USE OF M5™ ADVANCED ZIRCONIUM ALLOY FUEL ROD CLADDING

1.2.7.1 Applicable Regulations: 10 CFR 50.46 and 10 CFR 50, Appendix K

Pursuant to 10 CFR 52.7 and 10 CFR 52.93, PPL Bell Bend, LLC requests an exemption from the requirements of 10 CFR 50.46, Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors, and 10 CFR 50, Appendix K, ECCS Evaluation Models, paragraph I.A.5, regarding the use of Zircaloy or ZIRLO as fuel cladding material. This exemption request is related to the proposed use of the M5™ advanced zirconium alloy for the BBNPP fuel rod cladding and fuel assembly structural material.

1.2.7.2 Discussion:

In accordance with 10 CFR 52.7, the Commission may grant exemptions from requirements of the regulations of 10 CFR 52 and that the NRC consideration is governed by 10 CFR 50.12. 10 CFR 50.12 states that the NRC may grant an exemption provided that: 1) the exemption is authorized by law, 2) the exemption will not present an undue risk to public health and safety, 3) the exemption is consistent with common defense and security, and 4) special circumstances, as defined in 10 CFR 50.12(a)(2) are present. The requested exemption to allow the use of advanced zirconium alloys other than Zircaloy and ZIRLO for fuel cladding material for BBNPP satisfies these requirements as described below.

The NRC has approved similar exemption requests for other nuclear power plants; in particular, fuel with M5™ cladding is used in several operating plants in the United States.

The fuel that will be irradiated in the BBNPP contains cladding material that does not conform to the cladding material designations explicitly defined in 10 CFR 50.46 and 10 CFR 50, Appendix K. However, the criteria for these sections are satisfied for the BBNPP core containing M5™ fuel rod cladding and fuel assembly structural material. Therefore, the requested exemption is authorized by law.

The M5™ fuel rod cladding and fuel assembly structural material have been evaluated to confirm that the operation of this fuel product does not increase the probability of occurrence or the consequences of an accident. The evaluation also concluded that no new or different type of accident will be created that could pose a risk to public health and safety. In addition, appropriate safety analyses have been performed to demonstrate that this fuel type does not present an undue risk to the public health and safety. NRC approved safety analyses methods

are used for the BBNPP core which contains M5™ fuel rod cladding and fuel assembly structural materials.

The M5™ fuel rod cladding is similar in design to the cladding material used in operating plants. The special nuclear material in this fuel product will be handled and controlled in accordance with approved procedures. It has been confirmed through evaluation that M5™ fuel rod cladding and fuel assembly structural material will not endanger the common defense and security.

The special circumstance necessitating the request for exemption to 10 CFR 50.46 and 10 CFR 50, Appendix K is that neither of these regulations allows the use of M5™ fuel rod cladding material. The underlying purpose of 10 CFR 50.46 is to ensure that nuclear power facilities have adequately demonstrated the cooling performance of the Emergency Core Cooling System (ECCS). Topical Report BAW-10227P-A, Evaluation of Advanced Cladding and Structural Material (M5™) in PWR Reactor Fuel, approved by the NRC by letter dated February 4, 2000, demonstrates that the effectiveness of the ECCS will not be affected by a change from Zircaloy fuel rod cladding to M5™ fuel rod cladding.

The underlying purpose of 10 CFR 50, Appendix K, paragraph I.A.5 is to ensure that cladding oxidation and hydrogen generation are appropriately limited during a LOCA and conservatively accounted for in the ECCS evaluation model. Specifically, 10 CFR 50, Appendix K requires that the Baker-Just equation be used in the ECCS evaluation model to determine the rate of energy release, cladding oxidation, and hydrogen generation. Appendix D of BAW-10227P-A demonstrates that the Baker-Just model is conservative in all post-LOCA scenarios with respect to the use of M5™ advanced alloy as a fuel rod cladding material.

Therefore, the intent of 10 CFR 50.46 and 10 CFR 50, Appendix K is satisfied for the planned operation with M5™ fuel rod cladding and fuel assembly structural material. Issuance of an exemption from the criteria of these regulations for the use of M5™ fuel rod cladding and fuel assembly structural material in the BBNPP core will not compromise safe operation of the reactor.

For these reasons, PPL Bell Bend, LLC requests approval of the requested exemption from the 10 CFR 50.46 and 10 CFR 50, Appendix K, requirements regarding the use of Zircaloy or ZIRLO as fuel cladding material.

1.2.8 DEDICATED CONTAINMENT PENETRATIONS

1.2.8.1 Applicable Regulation: 10 CFR 50.34(f)(3)(iv)

Pursuant to 10 CFR 52.7 and 10 CFR 52.93, PPL Bell Bend, LLC requests an exemption from the requirements of 10 CFR 50.34(f)(3)(iv) with respect to providing a dedicated containment penetration. The specific requirement is as follows.

Provide one or more dedicated containment penetrations, equivalent in size to a single 3-foot diameter opening, in order not to preclude future installation of systems to prevent containment failure, such as filtered vented containment system.

1.2.8.2 Discussion:

In accordance with 10 CFR 52.7, the Commission may grant exemptions from requirements of the regulations of 10 CFR 52 and that the NRC consideration is governed by 10 CFR 50.12. 10 CFR 50.12 states that the NRC may grant an exemption provided that: 1) the exemption is

authorized by law, 2) the exemption will not present an undue risk to public health and safety, 3) the exemption is consistent with common defense and security, and 4) special circumstances, as defined in 10 CFR 50.12(a)(2) are present. The requested exemption relative to not utilizing a dedicated containment penetration for BBNPP satisfies these requirements as described below.

This requested exemption is not precluded by law.

The BBNPP design does not utilize a dedicated containment penetration. The severe accident assessment (U.S. EPR FSAR Tier 2 Section 19.2), the Probabilistic Risk Assessment (U.S. EPR FSAR Tier 2 Section 19.1) and the containment analysis (U.S. EPR FSAR Tier 2 Section 6.2) demonstrate that a dedicated containment penetration is not required. Specific containment overpressure protection is provided through its large size and strength and through the availability of 47 Passive Autocatalytic Recombiners (PARs) and Severe Accident Heat Removal System (SAHRS) for the removal of hydrogen and steam, respectively, the principle contributors to high containment pressure during a severe accident. The functions of these systems are described in U.S. EPR FSAR Tier 2 Section 19.2.3.3.2. Therefore, the requested exemption does not present an undue risk to the public health and safety.

The severe accident assessment, the Probabilistic Risk Assessment and the containment analysis demonstrate that a dedicated containment penetration is not required. As such, the requested exemption will not endanger the common defense and security.

The special circumstance necessitating the request for exemption is that the severe accident assessment, the Probabilistic Risk Assessment and the containment analysis demonstrate that a dedicated containment penetration is not required, as previously discussed. Therefore, application of the rule is not necessary to achieve the underlying purpose of the rule.

For these reasons, PPL Bell Bend, LLC requests approval of the requested exemption from 10 CFR 50.34(f)(3)(iv) with respect to providing a dedicated containment penetration.

1.2.9 USE OF 2004 EDITION OF THE ASME CODE

1.2.9.1 Applicable Regulation: 10 CFR 50.55a

Pursuant to 10 CFR 52.7 and 10 CFR 52.93, PPL Bell Bend, LLC requests an exemption from the requirements of 10 CFR 50.55a with respect to the edition of the ASME Code to be applied in the BBNPP COL Application.

10 CFR 50.55a codifies the ASME code as part of the NRC requirements and currently specifies the use of the 2001 Edition through the 2003 Addenda of the ASME Code. Consistent with NRC policy, 10 CFR 50.55a is amended periodically to incorporate newer editions and addenda of the ASME Code and Code Cases. The current proposed rulemaking (72 FR 16731 dated April 5, 2007) will incorporate the 2004 Edition of the ASME Code. This exemption is only necessary until such time as the rulemaking is finalized and becomes effective.

1.2.9.2 Discussion:

The 2004 Edition of the ASME Code (no addenda) is applied in the BBNPP COL Application, consistent with the NRC proposed rulemaking to endorse and incorporate the newer edition and addenda. The use of the 2004 Edition of the ASME Code will not take precedence over any ASME Code modifications or limitations currently outlined in 10 CFR 50.55a. This is dictated under the assumption that all modifications and limitations to the 2001 ASME Code and up to

the 2003 Addenda as outlined currently by 10 CFR 50.55a will remain valid upon NRC endorsement of the 2004 Edition of the ASME Code. Until such time as an exemption is granted, reconciliation has been conducted with the latest ASME Code edition endorsed by the NRC.

In accordance with 10 CFR 52.7, the Commission may grant exemptions from requirements of the regulations of 10 CFR 52 and that the NRC consideration is governed by 10 CFR 50.12. 10 CFR 50.12 states that the NRC may grant an exemption provided that: 1) the exemption is authorized by law, 2) the exemption will not present an undue risk to public health and safety, 3) the exemption is consistent with common defense and security, and 4) special circumstances, as defined in 10 CFR 50.12(a)(2) are present. The requested exemption to permit the use of the 2004 Edition of the ASME Code for BBNPP satisfies these requirements as described below.

This requested exemption is not precluded by law.

10 CFR 50.55a codifies the ASME code as part of the NRC requirements and currently specifies the use of the 2001 Edition through the 2003 Addenda of the ASME Code. Consistent with NRC policy, 10 CFR 50.55a is amended periodically to incorporate newer editions and addenda of the ASME Code and Code Cases. The current proposed rulemaking will incorporate the 2004 Edition of the ASME Code . Therefore, the requested exemption does not present an undue risk to the public health and safety.

10 CFR 50.55a codifies the ASME code as part of the NRC requirements and currently specifies the use of the 2001 Edition through the 2003 Addenda of the ASME Code. Consistent with NRC policy, 10 CFR 50.55a is amended periodically to incorporate newer editions and addenda of the ASME Code and Code Cases. The current proposed rulemaking will incorporate the 2004 Edition of the ASME Code. As such, the requested exemption will not endanger the common defense and security.

The special circumstance necessitating the request for exemption is that the current rulemaking will incorporate the 2004 Edition of the ASME Code . The acceptability of the 2004 Edition of the ASME Code in terms of public health and safety is recognized by virtue of the proposed rulemaking, and compliance with the existing edition of the ASME Code in the intervening months is not necessary to achieve the underlying intent of the rule.

For these reasons, PPL Bell Bend, LLC requests approval of the requested exemption from 10 CFR 50.55a with respect to the edition of the ASME Code to be applied in the BBNPP COL Application.