Bell Bend Nuclear Power Plant

Combined License Application

Part 7: Departures and Exemption Requests

Revision 2 |

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

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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. Exclusion Area Boundary
2. Maximum Annual Average Atmospheric Dispersion Factor (0.5 Mile – Limiting Sector)
3. 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)
4. Estimated Annual Radioactive Liquid and Gaseous Releases
5. Response to Safe Shutdown Earthquake (SSE)
6. In-structure Response Spectra (ISRS)
7. Idealized Site Soil Profiles
8. Toxic gas detection and Isolation
9. Generic Technical Specifications and Bases - Setpoint Control Program
10. Engineered Fill Soil Maximum Unit Weight

1.1.1 EXCLUSION AREA BOUNDARY

1.1.1.1 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

1.1.1.2 Summary of Departure:

The U.S. EPR FSAR identifies the Exclusion Area Boundary (EAB) is 0.50 mi (0.8 km). The exclusion area boundary (EAB) for BBNPP is a circle with a radius of 2,272 ft (692 m) or approximately 0.43 mi (0.69 km) measured from the centerpoint of the Reactor Containment Building. The EAB establishes a radius of at least 0.393 mi (0.632 km) from the potential release points. The BBNPP identifies a site-specific EAB as 0.43 mi (0.69 km) which is less than the U.S. EPR FSAR value.

1.1.1.3 Extent/Scope of Departure:

This Departure is identified in BBNPP FSAR Table 2.0-1 and Sections 2.1, 2.3.4.3, and 15.0.3.

1.1.1.4 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.

1.1.1.5 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.

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

1.1.2.1 Affected U.S. EPR FSAR Sections: Tier 2 Table 2.1-1 and Section 2.3.5

1.1.2.2 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 sec/m^3. The corresponding BBNPP value is 9.672E-06 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).

1.1.2.3 Scope/Extent of Departure:

This Departure is identified in BBNPP FSAR Table 2.0-1 and Table 15.0-1 and Section 2.3.5.

1.1.2.4 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 a 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 2.3-156, 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, and in the construction parking lot in the NW sector. 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 and NW 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.

1.1.2.5 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.

1.1.3 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)

1.1.3.1 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

1.1.3.2 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 $\leq$ 1.75E-4 sec/m^3, $\leq$ 1.35E-4 sec/m^3, and $\leq$ 1.00E-4 sec/m^3, respectively. The corresponding BBNPP values are 2.766E-04 sec/m^3, 1.648E-04 sec/m^3, and 1.038E-04 sec/m^3, respectively, as referenced in BBNPP FSAR Table 2.3-147,EAB/LPZ Accident χ/Q Values for Ground Level Releases Using SSES 2001-2007 Meteorilogical Data. 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 sec/m^3. The corresponding BBNPP value is 1.029E-3 sec/m^3 (EAB, Analytical Distance of 0.393 mi (0.632 km)) as referenced in BBNPP FSAR Table 2.3-147, EAB/LPZ Accident χ/Q Values for Ground Level Releases Using SSES 2001-2007 Meteorlogical Data.

1.1.3.3 Scope/Extent of Departure:

This Departure is identified in BBNPP FSAR Table 2.0-1,Section 2.3.4.1, Table 2.3-147, Section 15.0.3, Table 15.0-1 and Table 15.0-3.

1.1.3.4 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 atAnalytical Distance of 0.393 mi (0.632 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.

1.1.3.5 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, Analytical Distance of 0.393 mi (0.632 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.

1.1.4 ESTIMATED ANNUAL RADIOACTIVE LIQUID AND GASEOUS RELEASES

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

1.1.4.2 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 C^{14}) 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.

1.1.4.3 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 11.2-6 and 11.2-7 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.

1.1.4.4 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.

1.1.4.5 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.

1.1.5 RESPONSE TO SAFE SHUTDOWN EARTHQUAKE (SSE)

1.1.5.1 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

1.1.5.2 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.

1.1.5.3 Scope/Extent of Departure:

This Departure is identified in BBNPP FSAR Table 2.0-1, Sections 2.0, 2.5.2.6, 3.7.1, 3.7.2, 3.10, Appendix 3C, and Attachment E to Appendix 3D and Appendix 3E.

1.1.5.4 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 Section 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 Section 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.

1.1.5.5 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.

1.1.6 IN-STRUCTURE RESPONSE SPECTRA (ISRS)

1.1.6.1 Affected U.S. EPR FSAR Sections: Tier 2 Section 3.7.1, 3.7.2, 3.7.3 and 3.10

1.1.6.2 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.

1.1.6.3 Scope/Extent of Departure:

This Departure is identified in BBNPP FSAR, Sections 2.5.2.6 3.7.1, 3.7.2 and 3.10.

1.1.6.4 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 Section 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 Section 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 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.

1.1.7 IDEALIZED SITE SOIL PROFILES

1.1.7.1 Affected U.S. EPR FSAR Sections: Tier 2 Section 3.7.1, 3.7.2 and Appendix 3C

1.1.7.2 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.

1.1.7.3 Scope/Extent of Departure:

This Departure is identified in BBNPP 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. 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 Section 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 Section 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 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 evaluated in the plant-specific FSAR;

4. Result in more than a minimal increase in the consequence 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.

1.1.8 TOXIC GAS DETECTION AND ISOLATION

1.1.8.1 Affected U.S. EPR FSAR Sections: Tier 1 Section 2.6.1, Tier 2 Section 1.8, Tier 2 Section 3.11, Tier 2 Section 6.4, Tier 2 Section 9.4.1, Tier 2 Section 14.2.12.8.10, Tier 2 Chapter 16

1.1.8.2 Summary of Departure:

The U.S. EPR FSAR Tier 1 Section 2.6.1 requires that the main control room air conditioning system maintain habitability of the control room envelope and ambient temperature conditions inside the control room envelope during toxic gas contamination events. As a result, the U. S. EPR design provides a toxic gas alarm signal with automatically closing air intake dampers. For BBNPP, the toxic gas alarm signal is not required and automatic system isolation and protection from toxic gas contamination events is not part of the site-specific design basis.

1.1.8.3 Scope/Extent of Departure:

This Departure is identified in BBNPP FSAR Sections 1.8, 3.11, 6.4, 9.4.1 and 14.2.12.

1.1.8.4 Departure Justification

An evaluation of the site-specific toxic chemical hazards in BBNPP FSAR Section 2.2.3 did not identify any credible toxic chemical accidents that exceeded the Main Control Room IDHL limits within two minutes of detection. In accordance with Regulatory Guide 1.78, human exposures to toxic chemicals can be tolerated for up to two minutes at IDLH without incapacitation. Thus, a two minute exposure to IDLH limits provides an adequate margin of safety for control room operators. It is expected that a control room operator will take protective measures within two minutes (adequate time to don a respirator and protective clothing) after the detection and, therefore, will not be SUbjected to prolonged exposure at the IDLH concentration levels. The only chemical hazards that result in exceeding the IDLH after two minutes from detection threshold in the control room are natural gas/methane and cmmonia and are identified in FSAR Table 2.2.-10. No specific detection and automatic actuation features are necessary to protect the control room operators from an event involving release of a toxic gas Therefore, detection of toxic gases and subsequent automatic isolation of the Control Room Envelope is not required and is not part of the BBNPP site-specific design basis. This represents a Departure from the U.S. EPR FSAR.

1.1.8.5 Departure Evaluation

This Departure associated with detection of toxic gas and automatic isolation of the Control Room Envelope has been evaluated and determined not to adversely affect the safety function of the Main Control Room operators..

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 the resolution of a severe accident issue identified in the plant-specific FSAR.

Therefore, this Departure has no safety significance.

1.1.9 GENERIC TECHNICAL SPECIFICATIONS AND BASES -SETPOINT

1.1.9.1 Affected U.S. EPR FSAR Sections: Tier 2 Section 16 - Technical Specifications (TS) 3.3.1 and 5.5, and Bases 3.3.1

1.1.9.2 Summary of Departure:

A Setpoint Control Program (SCP) is adopted in the BBNPP Technical Specifications (TS). TS 3.3.1 is revised to delete the associated Reviewer's Notes and bracketed information. Applicable Surveillance Requirements and footnotes are revised to reference the SCP. Numerical setpoints are removed and replaced with a reference to the SCP. TS 5.5 is revised to delete the associated Reviewer's Note. Also, a SCP description will be added to the Administrative Controls - Programs and Manuals section (5.5). The SCP description references the NRC approved setpoint methodology documents that shall be used for the development of required numerical setpoints. The TS Bases 3.3.1 are revised to delete the associated Reviewer's Note, incorporate

additional background information, and clarify the applicability of the program to certain specific functions.

1.1.9.3 Scope/Extent of Departure:

This Departure is identified in Section A of Part 4 of the BBNPP COL Application, Generic Change Items 1, 14 and 17.

1.1.9.4 Departure Justification

Certain plant specific setpoints cannot be determined until after the selection of instrumentation and require as-built system design information, which may not occur until after the approval of the COL application is granted. SECY-08-0142, Change in Staff Position Concerning Information in Plant-Specific Technical Specifications that Combined License Applicants Must Provide to Support *Issuance of Combined Licenses,* " states that *"the plant-specific Technical Specifications issued with a combined license must be complete, implementable, and provide a basis for the Commission to conclude that the plant will operate in accordance with the relevant require ments." An option to satisfy this requirement is to relocate numerical values out of the TS and replace them with an administrative program that references NRC approved methodologies for determining these values. Writer Notes in the Generic Technical Specifications permit the COL applicant to relocate these numeric values through the use of a SCP. The methodologies to be cited in the SCP for determining these numerical values have been subm itted to NRC. Referencing these NRC approved methodologies in the T S provide reasonable assurance that t he facility will be operated in conformity with the license, the provisions of the Act, and the Commission's rules and regulations.*

1.1.9.5 Departure Evaluation

This Departure, the inclusion of a Setpoint Control Program and the associated changes in the TS and Bases, provides adequate assurance the required Limiting Trip Setpoints and Nominal Trip Setpoints are developed and maintained such that safety functions will actuate at the point assumed in the applicable safety analysis.

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 the resolution of a severe accident issue identified in the plant-specific FSAR.

Therefore, this Departure has no safety significance.

1.1.10 ENGINEERED FILL SOIL MAXIMUM UNIT WEIGHT

1.1.10.1 Affected U.S. EPR FSAR Sections: Tier 2 Section 2.5.4.2, 2.5.4.5, 2.5.5, and 3.8.4.3

1.1.10.2 Summary of Departure:

The U.S. EPR FSAR identifies the idealized engineered backfill soil profile. BBNPP site specific soil conditions are confirmed to lie within the U.S. EPR design certification envelope with the exception of BBNPP Category 1 Granular Structural Fill and BBNPP Category 1 Granular Backfill unit weight values, which exceed the acceptable limits specified in the EPR FSAR. The granular backfill exceedance ranges from 4.5% to 4.7%.

1.1.10.3 Scope/Extent of Departure:

These Departures are identified in Part 2 FSAR, Section 2.5.4.2.4.1 and 2.5.4.2.4.2.

1.1.10.4 Departure Justification

Engineered Fill originates from borrow areas that are within a reasonable distance of the site. The unit weight is a site specific property of the available borrow area soils.

BBNPP Category 1 Granular Structural Fill is used as fill under the Emergency Diesel Generator Building and the ESWS Cooling towers. Site amplification has been analyzed using site specific values and impact on results is negligible..

BBNPP Category 1 Granular Backfill is used as backfill around a number Category 1 buildings. The Lateral Earth Pressure Loads resulting from use of BBNPP site specific backfill material have been calculated and have been determined not to be significant. The 4.5% to 4.7% exceedence is marginal and will be accounted for through the application of an adequate factor of safety in the design of the structures .

1.1.10.5 Departure Evaluation

This Departure, associated with the site-specific soil densities and the impact on Lateral Earth Pressure Loads has been evaluated and determined to not impact the safety function of the Nuclear Island and other safety related structures on the BBNPP site.

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 the 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. Exclusion Area Boundary,
2. Maximum Annual Average Atmospheric Dispersion Factor (0.5 Mile – Limiting Sector),
3. 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)
4. Safe Shutdown Earthquake (SSE),
5. Fitness For Duty Program,
6. Use of M5™ Advanced Zirconium Alloy Fuel Rod Cladding. and
7. Toxic Gas Detection and Isolation.

The exemption request associated with Use of M5^{TM} Advanced Zirconium Alloy Fuel Rod Cladding is the same as that 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 EXCLUSION AREA BOUNDARY

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 Sections 2.1 and 15.0.3 identifies the Exclusion Area Boundary (EAB) is 0.50 mi (0.8 km). The exclusion area boundary (EAB) for BBNPP is a circle with a radius of 2,272 ft (692 m) or approximately 0.43 mi (0.69 km) measured from the centerpoint of the Reactor Containment Building. The EAB establishes a radius of at least 0.393 mi (0.632 km) from the potential release points. 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.

1.2.1.2 Discussion:

This EAB is discussed in BBNPP FSAR Table 2.0-1 and Sections 2.1, 2.3.4.3 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.

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

1.2.2.1 Applicable Regulation: 10 CFR Part 52

The U.S. EPR FSAR Tier 2 Table 2.1-1 identifies the Maximum Annual Average Atmospheric Dispersion Factor (0.5 mi (0.8 km) – limiting sector) of $\leq$ 4.973E-6 sec/m^3. The corresponding BBNPP value is 9.672E-06 sec/m^3, as referenced in BBNPP FSAR Table 2.3-156, 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).

1.2.2.2 Discussion:

The U.S. EPR FSAR Tier 2 Table 2.1-1 identifies the Maximum Annual Average Atmospheric Dispersion Factor (0.5 mi (0.8 km) – limiting sector) of $\leq$ 4.973E-6 sec/m^3. The corresponding BBNPP value is 9.672E-06 sec/m^3, as referenced in BBNPP FSAR Table 2.3-156, 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 0.2 mi (0.32 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 a 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 2.3-156, 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, and in the construction parking lot in the NW sector. 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 and NW,E 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 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).

1.2.3 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)

1.2.3.1 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 sec/m^3, $\leq$ 1.35E-4 sec/m^3, and $\leq$ 1.00E-4 sec/m^3,respectively. The corresponding BBNPP values are 2.766E-04 sec/m^3, 1.648E-04 sec/m^3, and 1.038E-04 sec/m^3, respectively, as referenced in BBNPP FSAR Table 2.3-147, EAB/LPZ Accident χ/Q Values for Ground Level Releases Using SSES 2001-2007 Meteorological Data. 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 sec/m^3. The corresponding BBNPP value is 1.029E-3 sec/m^3 as referenced in BBNPP FSAR Table 2.3-147, EAB/LPZ Accident χ/Q Values for Ground Level Releases Using SSES 2001-2007 Meteorological Data.

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)).

1.2.3.2 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 sec/m^3, $\leq$ 1.35E-4 sec/m^3, and $\leq$ 1.00E-4 sec/m^3. The corresponding BBNPP values are 2.766E-04 sec/m^3, 1.648E-04 sec/m^3, and 1.038E-04 sec/m^3, respectively, as referenced in BBNPP FSAR Table 2.3-147, {EAB/LPZ Accident χ/Q Values for Ground Level Releases Using SSES 2001-2007 Meteorological Data}. 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 sec/m^3. The corresponding BBNPP value is 1.029E-3 sec/m^3 as referenced in BBNPP FSAR Table 2.3-147, {EAB/LPZ Accident χ/Q Values for Ground Level Releases Using SSES 2001-2007 Meteorological Data}.

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/Qs 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 Analytical Distance of 0.393 mi (0.632 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 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, Analytical Distance of 0.393 mi (0.632 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 requirments associated with the 0-2 hour Accident Atmospheric Dispersion Factor (EAB, Analytical Distance of 0.393 mi (0.632 km)).

1.2.4 SAFE SHUTDOWN EARTHQUAKE (SSE)

1.2.4.1 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.

1.2.4.2 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 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.

1.2.5 FITNESS FOR DUTY PROGRAM

1.2.5.1 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 anaylsis 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.

1.2.5.2 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.

1.2.6 USE OF M5™ ADVANCED ZIRCONIUM ALLOY FUEL ROD CLADDING

1.2.6.1 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.

1.2.6.2 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^{TM} 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^{TM} 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.

1.2.7 TOXIC GAS DETECTION AND ISOLATION

1.2.7.1 Applicable Regulation: 10 CFR 52

The U.S EPR FSAR Tier 1 Section 2.6.1 requires that the main control room air conditioning system maintain habitability of the control room envelope and ambient temperature conditions inside the control room envelope during toxic gas contamination events. As a result, the U.S. EPR design provides toxic gas detectors and an alarm signal with automatically closing air intake dampers. For BBNPP, the toxic gas detectors, alarm signal, and automatic ventilation isolation are not required and automatic protection from toxic gas contamination events is not part of the site-specific design basis.

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 Tier 2 requirements associated with Control Room Envelope isolation as a result of the toxic gas detection, and alarm signal and automatic ventilation isolation.

1.2.7.2 Discussion:

The U.S. EPR design includes toxic gas detection and alarm signals to actuate automatic closure of the control room air intake dampers. An evaluation of the site-specific toxic chemicals hazards in BBNPP FSAR Section 2.2.3 did not identify any credible toxic chemical accidents that exceeded the Mai n Control Room IDLH limits within two minutes of detection. In accordance with Regulatory Guide 1.78, human exposures to toxic chemicals can be tolerated for up to two minutes at IDLH without incapacitation. Thus, a two minute exposure to IDLH limits provides an adequate margin of safety for control room operators. It is expected that a control room operator will take protective measures within two minutes (adequate tim e to don a respirator and protective clothing) after the detection and, therefore, will not be subjected to prolonged exposure at the IDLH concentration levels. The only chemical hazards that result in exceeding the IDLH in the control room are natural gas/methane and am monia and are identified in FSAR Table 2.2-10. No specific detection and automatic actuation features are necessary to protect the control room operators from an event involving release of a toxic gas. Therefore, detection of toxic gases and subsequent automatic isolation of the Control Room Envelope is not required and is not part of the BBNPP site-specific design basis. 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.

The change does not relate to security and does not otherw ise pertain to the common defense and security. Therefore, the requested exemption will not endanger the com mon defense and security.

The special circumstance necessitating the request for exemption is that it has been demonstrated via analysis that the toxic gas detection and alarm signal to initiate automatic closure of air intake dampers for the main control room envelope is not required, as previously discussed. Therefore, application of the rule is not necessary to achieve the underly ing purpose of the rule.

This requested exemption does not require a change in the design described in the U.S. EPR FSAR. This exemption request is based on the site specific toxic hazards evaluation and is requested only for BBNPP.

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 toxic gas detectors, alarms and automatic ventilation isolation for the Control Room Envelope.