Bell Bend Nuclear Power Plant

Combined License Application

Part 7: Departures and Exemption Requests

Revision 3

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. Maximum Annual Average Atmospheric Dispersion Factor (Limiting Sector)
2. Accident Atmospheric Dispersion Factor (0-2 Hour, 2-8 Hour, And 8-24 Hour Low Population Zone, and 0-2 Hour Exclusion Area Boundary)
3. Estimated Annual Radioactive Liquid and Gaseous Releases
4. Response to Safe Shutdown Earthquake (SSE)
5. In-structure Response Spectra (ISRS)
6. Idealized Site Soil Profiles
7. Engineered Fill Soil Maximum Unit Weight
8. Ultimate Heat Sink (UHS) Makeup Flow Rate
9. Setpoint Control Program
10. Radiological Consequences of Design-Basis Accidents
11. Reactor Coolant Pump Rotor Seizure (U.S. EPR FSAR Tier 2 Section 15.3.3.4)
12. Inadvertent Loading and Operation of a Fuel Assembly in an Improper Position (U.S. EPR FSAR Tier 2 Section 15.4.7.3)
13. Technical Specifications Bases - RCS Primary-to-Secondary Leakage
14. Technical Specifications - Decay Time prior to Fuel Movement

1.1.1 Maximum Annual Average Atmospheric Dispersion Factor (Limiting Sector)

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

1.1.1.2 Summary of Departure:

The U.S. EPR FSAR identifies the Maximum Annual Average Atmospheric Dispersion Factor (limiting sector) of $\leq$ 4.973E-6 sec/m^3. The corresponding BBNPP value is 6.781E-06 sec/m^3, as referenced in BBNPP FSAR Table 2.3-152, 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 WSW Sector at 0.16 mi (0.25 km).

1.1.1.3 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.

1.1.1.4 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 2.3-152, 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.

1.1.1.5 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.

1.1.2 Accident Atmospheric Dispersion Factor (0-2 Hour, 2-8 Hour, And 8-24 Hour Low Population Zone, and 0-2 Hour Exclusion Area Boundary)

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

1.1.2.2 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) 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 2.3-142, 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) as $\leq$ 1.00E-3 sec/m^3. The corresponding BBNPP value is 1.495E-03 sec/m^3 as referenced in BBNPP FSAR Table 2.3-142, EAB/LPZ Accident χ/Q Values for Ground Level Releases Using SSES 2001-2007 Meteorological Data.

1.1.2.3 Scope/Extent of Departure:

This Departure is identified in BBNPP FSAR Table 2.0-1,Section 2.3.4.1, Table 2.3-142, Section 15.0.3, Table 15.0-1 and Table 15.0-3.

1.1.2.4 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 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.

1.1.2.5 Departure Evaluation:

This Departure, associated with the 0-2 hour, 2-8 hour, and 8-24 hour Accident Atmospheric Dispersion Factors (Low Population Zone), and the 0-2 hour Accident Atmospheric Dispersion

Factor, 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.

1.1.3 Estimated Annual Radioactive Liquid and Gaseous Releases

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

1.1.3.2 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.

1.1.3.3 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.

1.1.3.4 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.

1.1.3.5 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.

1.1.4 Response to Safe Shutdown Earthquake (SSE)

1.1.4.1 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

1.1.4.2 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.

1.1.4.3 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.

1.1.4.4 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.

1.1.4.5 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.

1.1.5 In-structure Response Spectra (ISRS)

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

1.1.5.2 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.

1.1.5.3 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.

1.1.5.4 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.

1.1.5.5 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;
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 Idealized Site Soil Profiles

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

1.1.6.2 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.

1.1.6.3 Scope/Extent of Departure:

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

1.1.6.4 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.

1.1.6.5 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.

1.1.7 ENGINEERED FILL SOIL MAXIMUM UNIT WEIGHT

1.1.7.1 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

1.1.7.2 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 I Granular Structural Fill and BBNPP Category I 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%.

1.1.7.3 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.

1.1.7.4 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 I 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 I Granular Backfill is used as backfill around a number Category I 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.

1.1.7.5 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.

1.1.8 Ultimate Heat Sink (UHS) Makeup Flow Rate

1.1.8.1 Affected U.S. EPR FSAR Sections: Tier 1 Section 2.7.11.8, Tier 2 Table 9.2.5-2, Chapter 16 (Generic Technical Specification LCO 3.7.19 and Bases B 3.7.19)

1.1.8.2 Summary of Departure:

The U.S. EPR FSAR Tier 1 Section 2.7.11.8, Interface Requirements, and Tier 2, Table 9.2.5-2-Ultimate Heat Sink Design Parameters, identify that the minimum required site-specific

emergency makeup water flow to the UHS is 300 gpm. Additionally, the U.S. EPR FSAR Tier 2 Generic Technical Specifications LCO 3.7.19 Surveillance Requirement SR 3.7.19.6 and corresponding Bases B 3.7.19 require verification of the ability to supply makeup water to each UHS basin at ≥ 300 gpm at a frequency in accordance with the Inservice Testing Program. The BBNPP site-specific design for the UHS makeup water pump requires a flow rate of 200 gpm to the UHS basin to maintain basin level based on the worst case 27 day site-specific historical meteorological conditions after 72 hours post-Design Basis Accident (DBA).

1.1.8.3 Scope/Extent of Departure:

This Departure is identified in BBNPP FSAR 1.8-2, FSAR 9.2.5, FSAR 16 and COLA Part 4, Technical Specifications.

1.1.8.4 Departure Justification:

The U.S. EPR FSAR Tier 2, Table 9.2.5-2, Ultimate Heat Sink Design Parameters, identifies that the required site-specific emergency makeup water flow to the UHS is 300 gpm. Additionally, the Generic Technical Specifications for the U.S. EPR Ultimate Heat Sink in Chapter 16 of the U.S. EPR FSAR, Surveillance Requirement 3.7.19.6, requires verification of the ability to supply makeup water to each UHS basin at ≥ 300 gpm at a frequency in accordance with the Inservice Testing Program. Bases B 3.7.19 provides the basis for the specified makeup flowrate to ensure that sufficient Net Positive Suction Head (NPSH) can be maintained to operate the ESWS pumps following the first 3 days post LOCA for the assumed worst case meteorological conditions from the U.S. EPR Site Design Envelope.

A site-specific calculation was performed to determine the makeup flow rate to the UHS cooling towers based on the requirements of Regulatory Guide 1.27 after 72 hours post-DBA. The large break loss of coolant accident heat loads and the site-specific worst case consecutive 27 day period of meteorological data for evaporation were used to develop evaporation rates for the UHS cooling towers as required by Regulatory Guide 1.27. This site-specific analysis determined that only 200 gpm are necessary to compensate for evaporative losses when using the worst case 27 day meteorology. The 200 gpm flow rate to the UHS basins during the 27 day period ensures that basin level is maintained to provide adequate cooling inventory and NPSH for the ESWS pumps. The BBNPP site-specific 400 gpm UHS makeup water pump capacity rate includes 200 gpm for the maximum UHS cooling tower evaporation rate and 110 gpm for intermittent strainer backwash flow. UHS cooling tower drift and cooling tower basin seepage were found to be negligible with respect to pump sizing. The calculated flow rate includes a friction factor of 0.017 and an aging factor of 1.2. This results in approximately 29% margin for the UHS makeup flow rate.

1.1.8.5 Departure Evaluation:

This Departure from the U.S. EPR FSAR Tier 2 information does not change the UHS basin level needed to maintain NPSH for the ESWS pumps. The UHS makeup flow rate calculated to maintain basin inventory and ESWS pump NPSH for site-specific adverse meteorology during the post-DBA 27 day time period is less than prescribed in the U.S. EPR FSAR and the U.S EPR stated value of ≥ 300 gpm is not required based on the site-specific analysis for BBNPP. 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.

1.1.9 Setpoint Control Program

1.1.9.1 Affected U.S. EPR FSAR Sections: Tier 2, Chapter 16 (Generic Technical Specifications LCO 3.3.1 and Bases B 3.3.1 and Programs and Manuals 5.5)

1.1.9.2 Summary of Departure:

A Setpoint Control Program 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 Setpoint Control Program. The bracketed "Nominal Trip Setpoint" column of Table 3.3.1-2 is removed and replaced with a reference to the Setpoint Control Program. TS 5.5 is revised to add a Setpoint Control Program description to the Administrative Controls – Programs and Manuals section (5.5). The Setpoint Control Program 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 incorporate additional background information and clarify the applicability of the program to specific functions.

1.1.9.3 Scope/Extent of Departure:

This Departure is identified in the BBNPP FSAR 1.8-2, FSAR 16 and COLA Part 4, Technical Specifications.

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 requirements." 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. The methodologies cited in the Setpoint Control Program for determining these numerical values have been submitted to NRC. Referencing these NRC approved methodologies in the TS provide reasonable assurance that the 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 Setpoint (LTSP), Nominal Trip Setpoint (NTSP), Allowable Value (AV), Performance Testing Acceptance Criteria (PTAC), As-Left Tolerance (ALT), and Permissive values are developed and maintained such that safety functions will actuate at the point assumed in the applicable safety analysis. 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.

This change is both a Departure and an Exemption (as discussed in COLA Part 7, Section 1.2) requiring NRC approval.

1.1.10 RADIOLOGICAL CONSEQUENCES OF DESIGN-BASIS ACCIDENTS

1.1.10.1 Affected U.S. EPR FSAR Sections: Tier 2 Section 15.0.3 and associated Tables 15.0-12, 15.0-13, 15.0-14, 15.0-21, 15-0-23. 15.0-29, 15.0-34, 15.0-36, 15.0-38, 15.0-44, 15.0-45, 15.0-46, 15.0-48, and 15.0-53

1.1.10.2 Summary of Departure:

The BBNPP EAB distance from the reactor centerline, particularly in the West sector, has been reduced to accommodate continued occupancy by resident(s) adjacent to the site. The following presents conforming departures to U.S. EPR inputs of four DBA analyses (SLB, LRA, REA, FHA) that are required to demonstrate conservative dose projections at the reduced EAB. In most cases, these departures replace simplifying, bounding inputs with more rigorous, analytically derived inputs to yield more precise and lower source terms. The specific Departures associated with each of these DBA analyses are shown in the tabulation below.

Description	US EPR FSAR	BBNPP FSAR	
Small Line Break (SLB)			
Pressure drop along sampling line	Ignored	Credited	
Total mass flux at break (lbm/sec-ft^2) (Cross-over Leg, Loop 3)	22243	3447.2	
Flashing fraction	40%	86.1%	
Locked Rotor Accident (LRA)			
Primary-to-secondary SG tube leakage (gpm cold)	0.125	0.104	
Accident induced clad failure	9.5%	8.0%	
Rod Ejection Accident (REA)			
Core inventory source-term basis	Bounding (based on 2 – 5% U-235 enrichment and burnups up to 62 GWD/MTU)	Maximized (based on 5% U-235 enrichment and burnups up to 41 GWD/MTU)	
Accident induced clad failure	Primary containment release scenario	33.4%	26.0%
	Secondary-side release scenario	36.7%	
Fuel Handling Accident (FHA)			
Fuel assembly undecayed source-term basis	Bounding (based on 2 – 5% U-235 enrichment and burnups up to 62 GWD/MTU)	Maximized (based on 5% U-235 enrichment and burnups up to 41 GWD/MTU)	
Pre-accident decay time (hrs from all rods in)	34	72	

1.1.10.3 Scope/Extent of Departure:

These Departures are identified in the BBNPP FSAR Section 15.0.3, in the applicable portions for each individual DBA, and in results for each individual DBA in Table 15.0-2. Additional detail regarding the scope of the departures is presented below:

Small Line Break (SLB) – FSAR Section 15.0.3.5

The U.S. EPR FSAR analysis conservatively assumed that the NSS sampling line break locations were at the connecting points to the RCS, thus ignoring the pressure drop along the lines. This bounding assumption was refined in the BBNPP analysis by utilizing the RELAP-5 computer code, along with simplified representations of the sampling-line geometries, for determination of the break flows and flashing fractions at the actual postulated breaking point in the Fuel Building.

Locked Rotor Accident (LRA) – FSAR Section 15.0.3.8

The U.S. EPR FSAR analysis utilized a conservative value for the primary to secondary leakage of 0.125 gpm. The BBNPP analysis utilized the Technical Specification limit of 0.104 gpm for the primary to secondary leakage. In addition, the U.S. EPR FSAR analysis utilized a maximized clad failure and fuel melt/overheat that would yield 90% of the dose limit at the critical receptor. The BBNPP analysis utilized the maximum calculated clad failure of 8% based on fuel performance.

Rod Ejection Accident (REA) – FSAR Section 15.0.3.9

The U.S. EPR FSAR analysis utilized a core inventory based on 2 – 5% U-235 enrichment and burnups up to 62 GWD/MTU. The BBNPP analysis utilized a core inventory based on 5% U-235 enrichment and burnups up to 41 GWD/MTU. In addition, the U.S. EPR FSAR analysis utilized a maximized clad failure and fuel melt/overheat that would yield 90% of the dose limit at the critical limit. The BBNPP utilized the maximum calculated clad failure (26%) based on fuel performance data.

Fuel Handling Accident (FHA) – FSAR Section 15.0.3.10

The U.S. EPR FSAR analysis utilized a core inventory based on 2 – 5% U-235 enrichment and burnups up to 62 GWD/MTU. The BBNPP analysis utilized a core inventory based on 5% U-235 enrichment and burnups up to 41 GWD/MTU. In addition, the BBNPP analysis utilized a higher post-shutdown decay time of 72 hours versus 34 hours used in the U.S. EPR FSAR analysis.

1.1.10.4 Departure Justification:

These Departures are justified for the following reasons::

Small Line Break (SLB) – FSAR Section 15.0.3.5

The Departure made in the small line break analysis is justified since it involves the use of a more detailed and more realistic location for the postulated small line break and takes into account the pressure drop that would occur in the sampling line, rather than assuming that the break location occurred at the connecting point to the RCS. The use of the simplified representations of the sampling lines (namely, straight piping without bends or couplings) is acceptable because this results in less pressure drop in the lines and therefore a conservative flow results.

Locked Rotor Accident (LRA) – FSAR Section 15.0.3.8

The Departure in the Locked Rotor Accident for the primary to secondary leakage rate is justified since the value utilized in the BBNPP analysis is the limit specified in Technical Specifications (LCO 3.4.12), and is in line with Regulatory Guide 1.183, Appendix G, Section 5.1. The Departure in the clad failure input value is justified because 8% is the calculated value,

which represents the maximum amount of cladding failure that could occur for this type of postulated accident. The conservative clad failure of 9.5% assumed in the U.S. EPR FSAR was based on a maximized value that would yield 90% of the dose limit at the critical receptor. This maximized value of 9.5% was used in the U.S. EPR FSAR because the more detailed fuel performance data used to calculate the maximum amount of fuel cladding failure that could occur was not available at the time that the U.S. EPR FSAR analysis was performed.

Rod Ejection Accident (REA) – FSAR Section 15.0.3.9

The Departure in the core inventory is justified because the accident involves the failure of peak-powered fuel assemblies, which would have been exposed to a burnup less than 41 GWD/MTU at the time of the postulated accident. The Departure in the clad failure input value is justified because 26% is the calculated value representing the maximum amount of cladding failure that could occur for this type of postulated accident. The conservative clad failure of 36.7% assumed in the U.S. EPR FSAR was based on a maximized value that would yield 90% of the dose limit at the critical receptor. This maximized value of 36.7% was used in the U.S. EPR FSAR because the more detailed fuel performance data used to calculate the maximum amount of fuel cladding failure that could occur was not available at the time that the U.S. EPR FSAR analysis was performed.

Fuel Handling Accident (FHA) – FSAR Section 15.0.3.10

The Departure in the core inventory is justified because the accident involves the failure of peak-powered fuel assemblies, which would have been exposed to a burnup less than 41 GWD/MTU at the time of the postulated accident. The Departure in the decay time is justified because the expected minimum cooldown period after shutdown, before reactor head removal and fuel movement, is 90 hrs for the U.S. EPR (U.S. EPR FSAR Section 5.4.7.1). Additionally, the 72 hour decay time is a limit specified in the BBNPP Technical Specifications (LCO 3.9.3).

The above departed DBA analyses continue to conform to the regulatory guidance in SRP 15.0.3 and RG 1.183, and the resulting EAB and LPZ dose projections remain below regulatory limits.

1.1.10.5 Departure Evaluation:

This Departure associated with the BBNPP DBA analyses using more realistic, but still conservative, inputs as compared to the conservative inputs used in the U.S. EPR FSAR DBA analyses, does not result in any off site doses that exceed regulatory limits. In addition, this Departure does not result in any physical modifications to the plant. This Departure has been evaluated and determined not to adversely affect the safety functions of safety related structure, systems, or components. Furthermore:

1. This Departure does not result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the plant-specific FSAR;

2. This Departure does not 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. This Departure does result in more than a minimal increase in the consequences of an accident previously evaluated in the plant-specific FSAR. However, this change is acceptable because prior NRC review of the change is being accomplished via NRC

review of this COL Part 7 Departure and because all DBA limits and NUREG-0800 requirements associated with DBA accident consequences are met;

4. This Departure does not 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. It does involve the BBNPP DBA analyses using more realistic, but still conservative, inputs as compared to the conservative inputs used in the U.S. EPR FSAR DBA analyses. This change is acceptable because prior NRC review of the change is being accomplished via NRC review of this COL Part 7 Departure and because all DBA limits and NUREG-0800 requirements associated with DBA accident consequences are met;

5. This Departure does not create a possibility for an accident of a different type than any evaluated previously in the plant-specific FSAR;

6. This Departure does not 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. This Departure does not result in a design basis limit for a fission product barrier as described in the plant-specific FSAR being exceeded or altered; or

8. This Departure does not 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. Regarding the Small Line Break (SLB) analysis, a conservatively high leak flow rate was calculated previously for a break at the RCS connection for sample lines in the U.S. EPR FSAR. A reduced sample line leak flow rate was considered for this application by modeling the line geometry from the RCS to the prescribed break location using the RELAP5/MOD2-B&W code. This code, which is described in AREVA topical report BAW-10164P-A (Revision 6) "RELAP5/MOD2 – B&W, An Advanced Computer Program for LOCA and Non-LOCA Transient Analysis" in Final NRC Safety Evaluation [ML071620460], is a general purpose system thermal hydraulic code. It has been extensively benchmarked and used to predict flow rates for a wide variety of thermalhydraulic systems for both LOCA and non-LOCA transients. This includes mass and energy releases during various line break accidents used to support license amendment applications. Although modeling of the sample line with the RELAP5/MOD2-B&W code is a departure from the simplified methodology for determining flashing fraction and break flow presented in the U.S. EPR FSAR, use of this code to predict sample line flow rates is an acceptable licensing approach, and thus does not represent a departure from a method of evaluation.

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

Therefore, this Departure has no safety significance.

1.1.11 Reactor Coolant Pump Rotor Seizure

1.1.11.1 Affected U.S. EPR FSAR Sections: Tier 2 Section 15.3.3.4

1.1.11.2 Summary of Departure:

The design-basis radiological analyses for offsite radiological consequences and main control room habitability include evaluation of a Reactor Coolant Pump Rotor Seizure scenario with clad failure. The U.S. EPR FSAR analysis used a conservative clad failure of 9.5%, which was a

maximized value determined to yield 90% of the regulatory dose limit at the critical receptor. The BBNPP analysis departs from this approach and uses a more realistic, but still conservative, maximum calculated clad failure of 8%, based on fuel performance.

1.1.11.3 Scope/Extent of Departure:

This departure is identified in BBNPP FSAR Section 15.3.3.4.

1.1.11.4 Departure Justification:

The BBNPP departure in the clad failure input value for the Reactor Coolant Pump Rotor Seizure is justified because 8% is the calculated value, which represents the maximum amount of cladding failure that could occur for this type of postulated accident. The conservative clad failure of 9.5% assumed in the U.S. EPR FSAR was based on a maximized value that would yield 90% of the dose limit at the critical receptor. This maximized value of 9.5% was used in the U.S. EPR FSAR because the more detailed fuel performance data used to calculate the maximum amount of fuel cladding failure that could occur was not available at the time that the U.S. EPR FSAR analysis was performed.

1.1.11.5 Departure Evaluation:

This Departure, associated with the Reactor Coolant Pump Rotor Seizure, does not result in offsite doses in excess of the limits specified in 10 CFR 50.34, nor to control room operator doses in excess of the limits in 10 CFR 50, Appendix A (GDC 19). 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.

1.1.12 Inadvertent Loading and Operation of a Fuel Assembly in an Improper Position

1.1.12.1 Affected U.S. EPR FSAR Sections: Tier 2 Section 15.4.7.3

1.1.12.2 Summary of Departure:

For the U.S. EPR, the radiological consequences of inadvertent loading and operation of a fuel assembly in an improper position resulting in clad failure were determined to be bounded by the corresponding consequences for a Reactor Coolant Pump Rotor Seizure. The U.S. EPR FSAR analysis for this event used a conservative clad failure of 9.5%, which was a maximized value determined to yield 90% of the regulatory dose limit at the critical receptor. The corresponding BBNPP analysis departs from this approach and uses a more realistic, but still conservative, maximum calculated clad failure of 8%, based on fuel performance.

1.1.12.3 Scope/Extent of Departure:

This departure is identified in BBNPP FSAR Section 15.4.7.3

1.1.12.4 Departure Justification:

The BBNPP departure in the clad failure input value for the Reactor Coolant Pump Rotor Seizure (which bounds the radiological consequences of inadvertent loading and operation of a fuel assembly in an improper position) is justified because 8% is the calculated value, which represents the maximum amount of cladding failure that could occur for this type of postulated accident. The conservative clad failure of 9.5% assumed in the U.S. EPR FSAR was based on a maximized value that would yield 90% of the dose limit at the critical receptor. This maximized value of 9.5% was used in the U.S. EPR FSAR because the more detailed fuel performance data used to calculate the maximum amount of fuel cladding failure that could occur was not available at the time that the U.S. EPR FSAR analysis was performed.

1.1.12.5 Departure Evaluation:

The radiological consequences of this event are bounded by those for the Reactor Coolant Pump Rotor Seizure (see Section 1.1.11 above), which were determined to be acceptable. Therefore, this Departure has no safety significance.

1.1.13 Technical Specifications Bases - RCS Primary-to-Secondary Leakage

1.1.13.1 Affected U.S. EPR FSAR Sections: Tier 2 Chapter 16 (Generic Technical Specifications Bases B 3.4.12 and B 3.4.16)

1.1.13.2 Summary of Departure:

BBNPP has taken a departure from the analytical primary-to-secondary leakage value of 0.125 gpm per SG for the radiological evaluation of the Reactor Coolant Pump Rotor Seizure design-basis accident, using instead the LCO limit of 150 gallons per day per SG, or 0.104 gpm/ SG, specified in LCO 3.4.12.

1.1.13.3 Scope/Extent of Departure:

This departure is identified in BBNPP Technical Specifications Bases 3.4.12 and 3.4.16.

1.1.13.4 Departure Justification:

The primary-to-secondary RCS leakage at the LCO limit of 150 gallons per day per SG for the Reactor Coolant Pump Rotor Seizure design-basis accident is consistent with BBNPP FSAR Section 15.0.3 and is necessary to ensure that the radiological doses associated with this postulated accident remain within regulatory limits.

1.1.13.5 Departure Evaluation:

This Departure, associated with the RCS primary-to-secondary leakage, impacts the design input for the Reactor Coolant Pump Rotor Seizure (see Section 1.1.11 above). Since the radiological consequences for this event were determined to be acceptable, this Departure has no safety significance.

1.1.14 Technical Specifications - Decay Time prior to Fuel Movement

1.1.14.1 Affected U.S. EPR FSAR Sections: Tier 2 Chapter 16 (Generic Technical Specifications LCO 3.9.3 and Bases B 3.9.3)

1.1.14.2 Summary of Departure:

BBNPP has taken a departure from the decay time prior to fuel movement specified in LCO 3.9.3, and changed the minimum decay time from 34 hrs (as used in the U.S. EPR FSAR Fuel Handling Accident) to 72 hours.

1.1.14.3 Scope/Extent of Departure:

This departure is identified in BBNPP Technical Specifications LCO 3.9.3 and B 3.9.3.

1.1.14.4 Departure Justification:

BBNPP has increased the minimum required decay time prior to fuel movement from 34 to 72 hours. The additional decay time is consistent with BBNPP FSAR Section 15.0.3 and is necessary to ensure that the radiological doses associated with a postulated fuel handling accident remain within regulatory limits.

1.1.14.5 Departure Evaluation:

This Departure, associated with the increased decay time prior to fuel movement, does not result in offsite doses in excess of the limits specified in 10 CFR 50.34, nor to control room operator doses in excess of the limits in 10 CFR 50, Appendix A (GDC 19). 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.

1.2 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 Annual Average Atmospheric Dispersion Factor (0.5 Mile – Limiting Sector),
2. Accident Atmospheric Dispersion Factor (0-2 Hour, 2-8 Hour, And 8-24 Hour Low Population Zone, and 0-2 Hour Exclusion Area Boundary)
3. Safe Shutdown Earthquake (SSE),
4. Use of M5™ Advanced Zirconium Alloy Fuel Rod Cladding, and
5. Ultimate Heat Sink Makeup Flow
6. Setpoint Control Program

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 are provided in the following pages.

1.2.1 Maximum Annual Average atmospheric Dispersion Factor (Limiting Sector)

1.2.1.1 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 (limiting sector) of $\leq$ 4.973E-6 sec/m^3. The corresponding BBNPP value is 6.781E-06 sec/m^3, as referenced in BBNPP FSAR Table 2.3-152, 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 WSW Sector at 0.16 mi (0.25 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).

1.2.1.2 Discussion:

The U.S. EPR FSAR Tier 2 Table 2.1-1 identifies the Maximum Annual Average Atmospheric Dispersion Factor (limiting sector) of $\leq$ 4.973E-6 sec/m^3. The corresponding BBNPP value is 6.781E-06 sec/m^3, as referenced in BBNPP FSAR Table 2.3-152, Normal Effluent Annual Average, Undecayed, Undepleted χ/Q Values for Mixed Mode Release Using 242,458 cfm Flow Rate for Site Boundary Receptors, WSW Sector at 0.16 mi (0.25 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 2.3-152, 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 (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 (limiting sector).

1.2.2 Accident Atmospheric Dispersion Factor (0-2 Hour, 2-8 Hour, and 8-24 Hour Low Population Zone, and 0-2 Hour 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, 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) 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 2.3-142, 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) as $\leq$ 1.00E-3 sec/m^3. The corresponding BBNPP value is 1.495E-03 sec/m^3 as referenced in BBNPP FSAR Table 2.3-142, 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) and with U.S. EPR FSAR Tier 1 and 2 requirements associated with the 0-2 hour Accident Atmospheric Dispersion Factor (Exclusion Area Boundary).

1.2.2.2 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) 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 2.3-142, 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) as $\leq$ 1.00E-3 sec/m^3. The corresponding BBNPP value is 1.495E-03 sec/m^3 as referenced in BBNPP FSAR Table 2.3-142, 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 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 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) exceeds the U.S. EPR FSAR value. The 0-2 hour Atmospheric Dispersion Factor (EAB) also exceeds the U.S. EPR FSAR value. However, the BBNPP specific Accident Atmospheric Dispersion Factor (Low Population Zone and EAB), 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) and the requirements associated with the 0-2 hour Accident Atmospheric Dispersion Factor (EAB).

1.2.3 Safe Shutdown Earthquake (SSE)

1.2.3.1 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.

1.2.3.2 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.

1.2.4 Use of M5™ Advanced Zirconium Alloy Fuel Rod Cladding

1.2.4.1 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.

1.2.4.2 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™ 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.

1.2.5 ULTIMATE HEAT SINK (UHS) MAKEUP FLOW RATE

1.2.5.1 Applicable Regulation: 10 CFR Part 52

The U.S. EPR FSAR Tier 1 Section 2.7.11.8, Interface Requirements, requires that the required site-specific emergency makeup water flow to the UHS is 300 gpm. Additionally, the U.S. EPR FSAR Tier 2 Generic Technical Specifications LCO 3.7.19 Surveillance Requirement SR 3.7.19.6 and corresponding Bases B 3.7.19 require verification of the ability to supply makeup water to each UHS basin at ≥ 300 gpm at a frequency in accordance with the Inservice Testing Program. The BBNPP site-specific design for the UHS makeup water pump requires only ≥ 200 gpm to the UHS basin based on site-specific adverse historical meteorological conditions after 72 hours post DBA.

Pursuant to 10 CFR 50.12 and 10 CFR 52.7, PPL Bell Bend, LLC requests an exemption from compliance with the U.S. EPR FSAR Tier 1, Section 2.7.11.8 and Tier 2 Generic Technical Specification requirements associated with the UHS site-specific makeup flow.

1.2.5.2 Discussion:

The U.S. EPR FSAR Tier 1 Section 2.7.11.8, Interface Requirements, stipulate that the required site-specific emergency makeup water flow to the UHS is 300 gpm. The Generic Technical Specifications (GTS) for the U.S. EPR Ultimate Heat Sink are in Chapter 16 of the U.S. EPR FSAR. Surveillance Requirement 3.7.19.6 requires verification of the ability to supply makeup water to each UHS basin at ≥ 300 gpm at a frequency in accordance with the Inservice Testing Program. The GTS Bases (B 3.7.19) for the specified makeup flowrate ensures that sufficient NPSH can be maintained to operate the ESWS pumps following the first 3 days post LOCA for the assumed worst case meteorological conditions from the U.S. EPR Site Design Envelope.

A site-specific calculation was performed to determine the makeup flow rate to the UHS cooling towers based on the requirements of Regulatory Guide 1.27 after 72 hours post-LOCA. The large break loss of coolant accident heat loads and the site-specific worst case consecutive 27 day period of meteorological data for evaporation were used to develop evaporation rates for the proposed UHS cooling towers as required by Regulatory Guide 1.27. This site-specific analysis determined that only 200 gpm are necessary to compensate for evaporative losses when using the 27 day worst case meteorology.

The BBNPP site-specific 400 gpm UHS makeup water pump capacity rate includes 200 gpm for the maximum UHS cooling tower evaporation rate and 110 gpm for intermittent strainer backwash flow. UHS cooling tower drift and cooling tower basin seepage were found to be negligible with respect to pump sizing. The calculated flow rate includes a friction factor of 0.017 and an aging factor of 1.2. This results in approximately 29% margin. The ability to

maintain UHS basin inventory at a level that maintains sufficient inventory for post-DBA cooling and to maintain NPSH for the ESW pumps while maintaining system margin at a different UHS makeup flow rate has no impact on safety. 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 and will not present an undue risk to the public health and safety.

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 otherwise pertain to the common defense and security. Therefore, the requested exemption is consistent with the common defense and security.

This requested exemption does not require a change in the design described in the U.S. EPR FSAR.

Consistent with 10 CFR 50.12(a)(2)(ii), the special circumstance necessitating the request for exemption is that it has been demonstrated via site-specific analysis that the 200 gpm makeup flow to the UHS cooling tower basin is sufficient to maintain UHS basin inventory for ESW pump NPSH and to make up for evaporative losses for the site-specific adverse meteorological conditions. The U.S. EPR FSAR Tier 1 Section 2.7.11.8 and Generic Technical Specification 3.7.19 and Bases B3.7.19 stipulated ≥ 300 gpm makeup flow to the UHS basins is inconsistent with the site-specific analyses for BBNPP. As such, application of the regulation for this particular circumstance 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 compliance with the U.S. EPR FSAR Tier 1 Section 2.7.11.8 and Generic Technical Specification LCO 3.7.19 SR 3.7.19.6 and Bases B 3.7.19 requirements associated with UHS makeup flow rate.

1.2.6 Setpoint Control Program

1.2.6.1 Applicable Regulation: 10 CFR Part 52

The U.S. EPR FSAR Tier 2, Chapter 16.0, Technical Specifications and Bases specify setpoints for reactor trip, Engineered Safety Features functions, and Permissives.

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 Technical Specification requirements associated with the setpoints for reactor trip, Engineered Safety Features functions, and Permissives.

1.2.6.2 Discussion:

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 requirements." An option to satisfy this requirement is to relocate numerical values out of the Technical Specifications and replace them with an administrative program that references NRC approved methodologies for determining these values. Appropriate Technical Specifications will reference the Setpoint Control Program and a Setpoint Control Program description will be added to the Administrative Controls - Programs and Manuals

Section 5.5. The Setpoint Control Program references the methodologies for determining setpoints that have previously been submitted to NRC. Bases descriptions will be revised, as necessary. The change will not adversely affect the safety function of the associated structures, systems, components, reactor trip or Engineered Safety Features functions. Therefore, this exemption will not result in a significant decrease in the level of safety otherwise provided by the design described in the U.S. EPR FSAR and will not present undue risk to the public health and safety.

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 otherwise pertain to the common defense and security. Therefore, the requested exemption is consistent with the common defense and security.

This requested exemption relates to an administratively controlled program and does not require a physical change in the design described in the U.S. EPR FSAR. Therefore, this exemption will not result in any loss of standardization.

Consistent with 10 CFR 50.12(a)(2)(ii), the special circumstance necessitating the request for exemption is that the 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. The use of NRC approved methodologies, where applicable, will ensure the setpoints contained in, and controlled by, the Setpoint Control Program will not adversely affect the safety functions. 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.

For these reasons, PPL Bell Bend, LLC, requests approval of the requested exemption from compliance with the U.S. EPR FSAR Tier 2, Chapter 16.0, Technical Specifications and Bases, which specify setpoints for reactor trip, Engineered Safety Features functions, and Permissives.