Calvert Cliffs Nuclear Power Plant Unit 3

Combined License Application

Part 7: Departures and Exemption Requests

Revision 9
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This COLA Part is completely Site Specific

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1.0 DEPARTURES AND EXEMPTION REQUESTS

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1.1 DEPARTURES

This Departure Report includes deviations in the CCNPP Unit 3 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. EPR 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 Tilt Settlement (across the basemat)
2. Maximum Annual Average Atmospheric Dispersion Factor (limiting sector),
3. Accident Atmospheric Dispersion Factor (0-2 hour, Low Population Zone)
4. Shear Wave Velocity
5. Not used
6. Soil Column Beneath the Nuclear Island, ESWB and EPGB
7. Generic Technical Specifications and Bases - Setpoint Control Program
8. Human Performance Monitoring
9. Post-DBA UHS Keep-Fill line - UHS Makeup Water System
10. UHS Makeup Water Pump Starting Logic

1.1.1 MAXIMUM TILT SETTLEMENT (ACROSS THE BASEMAT)

Affected U.S. EPR FSAR Sections: Tier 1 Table 5.0-1, Tier 2 Table 2.1-1, Tier 2 Section 2.5.4.10.2

Summary of Departure:

The U.S. EPR FSAR identifies a maximum differential settlement of 1/2 inch in 50 feet (i.e., 1/1200) in any direction across the basemat. The estimated settlement values for the Emergency Generating Building foundations and Essential Service Water System Cooling Tower foundations exceed the U.S. EPR FSAR value.

Extent/Scope of Departure:

This Departure is identified in CCNPP Unit 3 FSAR Table 2.0-1 and Section 2.5.4.10.2.

Departure Justification:

The estimated site-specific tilt settlement for the Emergency Power Generating Buildings and Essential Service Water System Cooling Towers (based on a fully flexible basemat) are 1/1166 and 1/845 (approximately ½ and ¾ inch in 50 ft), respectively, as stated in FSAR Section 2.5.4.10.2.

As described in Sections FSAR 3.8.5.5.2 and 3.8.5.5.3, finite element analyses were performed for the Emergency Power Generating Buildings and Essential Service Water System Cooling Towers using soil springs representing the CCNPP Unit 3 site. For each structure, the tilt

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settlement within the confines of the building periphery is shown to be substantially less than the 1/1200 (1/2 inch in 50 feet) requirement of the U.S. EPR FSAR.

The variation of the finite element analysis tilt settlement with the estimated tilt settlements of Section 2.5.4.10.2 is attributed to the conventional geotechnical treatment of the foundation as a flexible plate, a condition much more conservative than the actual heavily stiffened (by deep reinforced concrete walls) 6'-0" thick reinforced concrete Emergency Power Generating Building and Essential Service Water System Cooling Tower basemats.

Finite element analyses were also performed to evaluate the effects of overall Emergency Power Generating Building and Essential Service Water System Cooling Tower tilts of L/550 and L/600, respectively, where L is the least basemat dimension. For these analyses:

- Spring stiffnesses are adjusted to achieve a tilt of L/550,
- The elliptical distribution of soil springs is maintained,
- Soil spring stiffnesses along the basemat centerline (perpendicular to the direction of tilt) are retained, and
- Adjustment is made to all other springs as a function of the distance from the basemat centerline to the edges.

Bending moments from these finite element analyses confirm that an uncracked condition of the Emergency Power Generating Building and Essential Service Water System Cooling Tower basemats is maintained.

Departure Evaluation:

This Departure, associated with the maximum tilt settlement of the Emergency Power Generating Building foundations and Essential Service Water System Cooling Tower foundations, has been evaluated and determined to not adversely affect the safety function of these 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;

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8. Result in a departure from a method of evaluation described in the plant-specific; or

9. 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 (LIMITING SECTOR)

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

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 CCNPP Unit 3 value is 5.039E-06 sec/m^3, as discussed in CCNPP Unit 3 FSAR Section 2.3.5, CCNPP Unit 3 Normal Effluent Annual Average, Undecayed, Undepleted χ/Q Values for Mixed Mode Release Using 242,458 cfm Flow Rate for Grid Receptors, NE Sector at 0.5 mile.

Scope/Extent of Departure:

This Departure is identified in CCNPP Unit 3 FSAR Table 2.0-1 and Section 2.3.5.

Departure Justification:

A review of CCNPP Unit 3 Environmental Report, Table 5.4-6, "Distance to Nearest Gaseous Dose Receptors," indicates that the NE sector of the Exclusion Area Boundary (EAB) (0.5 mile radius centered on Reactor Building) intersects with the Site Area Boundary (0.28 mile) at the shoreline of Chesapeake Bay. The Maximum Annual Average Atmospheric Dispersion Factor (χ/Q) value is computed at 0.5 miles which is a located approximately 0.22 mile off shore in the Chesapeake Bay. As discussed in CCNPP Unit 3 FSAR Section 2.3.5, all other sectors' annual average χ/Q value at 0.5 miles 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 value for CCNPP Unit 3 exceeds the χ/Q limiting value specified in Table 2.1-1 of the U.S. EPR FSAR, operation of CCNPP Unit 3 is justified for the following reasons:

- There are no persons currently living within the EAB or on its boundary in the NE 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 NE sector lies on Chesapeake Bay, therefore the probability of anyone living on a watercraft 0.22 mile off shore for an extended period of time is extremely low.

- The CCNPP Unit 3 will have control over the point in the NE sector at which EAB and the Site Boundary intersect.

- All other sectors' maximum annual average χ/Q value are within the limiting value specified in Table 2.1-1 of the U.S. EPR FSAR.

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

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, LOW POPULATION ZONE)

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

Summary of Departure:

The U.S. EPR FSAR identifies the 0-2 hour Accident Atmospheric Dispersion Factor (Low Population Zone) of $\leq$ 1.75E-4 sec/m^3. The corresponding CCNPP Unit 3 value is 2.151E-04 sec/m^3, as discussed in CCNPP Unit 3 FSAR Section 2.3.4, Site-Specific EAB/LPZ Accident χ/Q Values for Ground Level Releases.

Scope/Extent of Departure:

This Departure is identified in CCNPP Unit 3 FSAR Table 2.0-1, Section 2.3.4 and Section 15.0.3.

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Departure Justification:

The site specific Accident Atmospheric Dispersion Factors, including the Low Population Zone 0-2 hour at 1.5 miles χ/Q of 2.151E-04 sec/m^3, 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 doses were determined to be below the regulatory limits.

Departure Evaluation:

This Departure, associated with the 0-2 hour Accident Atmospheric Dispersion Factor (Low Population Zone, 1.5 miles), does not result in Low Population Zone 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 Shear Wave Velocity

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

Summary of Departure:

The U.S. EPR FSAR identifies a minimum shear wave velocity (low strain best estimate average value at bottom of basemat) of 1,000 feet per second (fps) in Tier 1, Table 5.0 1. This 1,000 fps requirement, without identifying specific structures, is repeated in Table 2.1-1 of Tier 2. Section 2.5.2.6, *Ground Motion Response Spectrum*, of the U.S. EPR FSAR states that the applicant will confirm that the low-strain, best-estimate, value of shear wave velocity at the bottom of the foundation basemat of the Nuclear Island (NI) Common Basemat Structures is

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1,000 fps, or greater. U.S. EPR FSAR Section 2.5.4.3, *Foundation Interfaces*, specifies the following requirement with respect to shear wave velocity:

> (4) adequate dynamic properties (i.e., shear wave velocity and strain-dependent modulus-reduction and hysteretic damping properties)

Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC, have elected to consider a shear wave velocity of less than 1,000 fps under any Seismic Category I facility described in the U.S. EPR FSAR as a departure. The best estimate shear wave velocity in Fill Layer 2, the fill from 6 feet below grade (the basemat of the Emergency Power Generating Building (EPGBs)) to 22 feet below grade is 900 fps. The best estimate shear wave velocity beneath the Essential Service Water Buildings (ESWBs) and the NI Common Basemat Structures is 1080 fps. Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC, are establishing acceptance criteria for shear wave velocity testing that are approximately one standard deviation less than the best estimate values, but greater than the lowest values used by the site-specific Soil-Structure Interaction (SSI) analysis. Establishing acceptance criteria greater than the lower bound but less than the best estimate value will ensure that the shear wave velocity testing demonstrates that the backfill has been properly graded and installed, while minimizing the potential for a false failure of the shear wave velocity due to small inconsistencies in the field measured data resulting in an average shear wave velocity that is within the bounds of the analysis, but less than the best estimate value from laboratory testing. Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC, have established that the shear wave velocity profile values of structural fill material for the CCNPP Unit 3 Seismic Category I and II structures, and the FP Building and FP Tanks, are greater than or equal to 1000 fps at depths of 41.5 ft or greater, greater than or equal to 845 fps at depths greater than or equal to 22 ft and less than 41.5 ft, greater than or equal to 720 fps for depths greater than or equal to 6 ft and less than 22 ft, and greater than or equal to 650 fps for depths greater than or equal to 0 ft and less than 6 ft. Since some of these values are less than 1,000 fps, this constitutes a departure.

Scope/Extent of Departure:

This Departure is identified in CCNPP Unit 3 FSAR Table 2.0-1 and Section 2.5.4.2.5.8, and in COLA Part 10, ITAAC Table 2.4-1.

Departure Justification:

The fill selected for CCNPP Unit 3 is competent material. It has a moist unit weight of 145 lb/ft^3 and an angle of internal friction of more than 40°. Both of these values exceed the U.S. EPR established criteria in Section 2.5.4.2, *Properties of Subsurface Materials*.

The U.S. EPR FSAR Tier 1 also states in Section 5.0:

> In the case of seismic design parameters, deviations from the defined conditions may be justified by site-specific soil-structure interaction analyses. The results may be used to confirm the seismic design adequacy of the certified design using approved methods and acceptance criteria.

The site-specific Soil-Structure Interaction (SSI) analysis performed for FSAR Section 3.7 establishes a range of acceptable shear wave velocities beneath the ESWBs, EPGBs, and the NI Common Basemat Structures . The lowest acceptable shear wave velocity is the best estimate minus one standard deviation. This analysis demonstrates that the ESWBs, EPGBs, and NI

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Common Basemat Structures withstand the safe shutdown earthquake (SSE) for that range of shear wave velocities.

Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) testing will be performed during construction to confirm that the shear wave velocity of the installed and compacted fill exceeds the best estimate minus one standard deviation shear wave velocity used in the FSAR Section 3.7 analysis. This ITAAC testing demonstrates acceptability of this aspect of the building seismic analysis.

Departure Evaluation:

This Departure, associated with the shear wave velocity for the fill beneath the ESWBs, EPGBs, and the NI Common Basemat Structures has been evaluated and determined to not adversely affect the safety function of these structures. Accordingly, this Departure does not:

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

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

Therefore, this Departure has no safety significance.

1.1.5 Not Used

1.1.6 Soil Column Beneath the Nuclear Island, ESWB and EPGB

Affected U.S. EPR FSAR Sections: Tier 2 Section 2.5.2.6, 3.7.1, and 3.7.2

Summary of Departure:

The soil column for the NI discussed in section 2.5.2.6 and presented in Table 2.5-76 and 2.5-77 and Figures 2.5-242 and 2.5-243 have a minimum strain compatible shear wave velocity, less

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than the 700 fps specified in U.S. EPR FSAR Tables 3.7.1-6 and 3.7.2-9. In addition the soil weight density is greater than the value specified in Table 3.7.2-9.

Scope/Extent of Departure:

This Departure is identified in Part 2 FSAR, Section 2.5.2.6.

Departure Justification:

This departure is justified in two parts as follows:

a. The soil column for the NI discussed in section 2.5.2.6 and presented in Table 2.5–76 and 2.5-77 and Figures 2.5-242 and 2.5-243 have a minimum strain compatible shear wave velocity, less than the 700 fps specified in U.S. EPR FSAR Tables 3.7.1-6 and 3.7.2-9.

   This portion of the departure has been identified because the NI Best Estimate SWV profile consists of weighted average backfill SWV's of 620 fps and 688 fps for the backfill layer. This departure can be justified for the following reasons.

   The departure addresses a SWV that is on average less than 12% lower than the minimum used in the U.S. EPR FSAR (700 fps).

   The average backfill SWV's of 620 fps and 688 fps is associated with the site-specific SSE which is used in the confirmatory analyses. Considering the CCNPP3 site-specific FIRS rather than the SSE, the strain-compatible SWV values would be equal to or larger than the minimum SWV value analyzed in the U.S. EPR FSAR. This means that the departure is a result of the use of a conservative SSE input to the confirmatory analyses.

   For the EPGB and ESWB, the CCNPP3 Best Estimate, Lower Bound, Upper Bound SWV profiles are included in Tables 3F-3, 3F-4, and 3F-5. Similar to the NI, these tables show a departure from the U.S. EPR FSAR minimum SWV of 700 fps.

   In order to quantify the impact of these departures, two approaches are taken.

   For the EPGB and ESWB, the confirmatory analysis was performed with the CCNPP3 values reflecting the backfill. As discussed in Section 2.5.2.6.2, Reconciliation Step 8, the comparison shows that the CCNPP3 ISRS are well bounded.

   For the, NI because the backfill was introduced after the completion of the confirmatory analysis, a different approach is used. This approach compares the FIRS with and without backfill. The effect of the backfill is to increase the ZPA and peak accelerations of the FIRS by 11% and 16% respectively. The NI FIRS with backfill remain bounded by the site SSE which is the basis for the confirmatory analysis.

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Another reason which makes the departure acceptable is that the departure is associated with low, not high SWV's. This is not critical because hard rock SWV profiles, not low SWV profiles, generally control the design of the U.S. EPR. Based on the logic that the high SWV's generally control the generic design, the low values that are the basis for the departure do not impact the conclusion that the U.S. EPR FSAR seismic response bounds the CCNPP3 site-specific response. This conclusion has been confirmed by the results of the CCNPP3 confirmatory analysis which are discussed in Reconciliation Step 8.

The overall conclusion is that the CCNPP3 SWV's profile is similar to and bounded by the 10 generic soil profiles used for the U.S. EPR. The CCNPP3 SWV profile is bounded by the U.S. EPR FSAR range of profiles because high rather than low SWV profiles generally control the generic design of the U. S. EPR.

b. In addition the soil weight density is greater than the value specified in Table 3.7.2-9.

This portion of the departure has been written to address the fact that the U.S. EPR FSAR seismic analyses are based on a soft soil unit weight of 110 pcf. The CCNPP3 unit weight for the in-situ soil in the NI, EPGB, and ESWB area ranges from 105 pcf to 125 pcf. The unit weight of the backfill is 145 pcf partially a result of the high compaction requirements. The confirmatory analysis for the EPGB and ESWB and the development of the FIRS for the NI used the site-specific unit weights. Therefore, the influence of this departure has been taken into account in the supporting analyses.

Departure Evaluation:

This Departure, associated with strain compatible shear wave velocities beneath the NI, EPGB, and ESWB 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 conclusion that the NI, EPGB, and ESWB safety-related structures may be used at the CCNPP Unit 3 as designed in the U.S. EPR FSAR.

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;

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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 GENERIC TECHNICAL SPECIFICATIONS AND BASES - SETPOINT CONTROL PROGRAM

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

Summary of Departure:

A Setpoint Control Program is adopted in the CCNPP Unit 3 Technical Specifications (TS). TS 3.3.1 is revised to delete the bracketed information. Applicable Surveillance Requirements 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 that the Reactor Trip, Engineered Safety Features, Safety Automation System, and Permissive setpoints specified in the Distributed Control TS are subject to the requirements of the SCP identified in TS 5.5.19, "Setpoint Control Program."

Scope/Extent of Departure:

This Departure is identified in the Generic Changes section of Part 4 of the CCNPP Unit 3 COL Application, Generic Change Items 2, 10 and 13.

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

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will be operated in conformity with the license, the provisions of the Act, and the Commission's rules and regulations.

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 plantspecific 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.

1.1.8 Human Performance Monitoring

Affected US EPR FSAR Sections: Tier 2 Section 18.12

Summary of Departure:

The U.S. EPR FSAR Section 18.12 provides an outline and criteria of the Human Performance Monitoring Program (HPM) performed throughout the life of the plant. The corresponding

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CCNPP Unit 3 FSAR Chapter 18.12 replaces the U.S. EPR FSAR program with the UniStar Nuclear Energy (UNE) Human Performance Monitoring Program.

The UniStar Nuclear Energy Human Performance Monitoring Program contains recent operating experience, which further refines requirements and interfaces for continuous improvement of human performance. The key elements of the program are:

- Scoping of the performance monitoring strategy,
- Development and documentation of the human performance monitoring strategy for implementation and continuous improvement across organizations,
- Structuring the program such that,
  - Human actions are monitored commensurate with their safety importance
  - Feedback of information and corrective actions are accomplished in a timely manner
  - Degradation in performance can be detected and corrected before plant safety is compromised
- Close approximation of performance data, in actual conditions, when measurable human performance information is not available,
- Ensuring the Corrective Action Program (CAP) is effectively incorporating identification, resolution and trending of human performance issues, in support of other programs such as self-assessments and peer reviews.

The Corrective Action Program is in accordance with the UniStar Nuclear Quality Assurance Program, which provides UniStar requirements for the documentation, review, resolution and tracking and trending of Human Performance issues throughout the life of the plant. The use of an operational focus index provides a rigorous approach to trend operator's day to day activities. The operation focus index leaves the flexibility, to include additional data sets in addition to industrial norms to ensure the rigor of issue analysis.

Scope/Extent of Departure:

This Departure is identified in CCNPP Unit 3 PART 2 FSAR, Section 18.12.

Departure Justification:

The US EPR FSAR Section 18.12 is replaced with UniStar Nuclear Energy's Human Performance Monitoring Program. This aligns with UNE's corporate strategy for HPM requirements and Corrective Action Program. The underlining objective of the UNE HPM strategy is to ensure no significant safety degradation occurs because of any changes that are made in the plant and to verify that the conclusions that have been drawn from the human performance evaluation remain valid over the life of the plant. UniStar Nuclear Energy's HPM Program meets the requirements of NUREG-0711, therefore, it is an acceptable replacement for the U.S. EPR HPM Program.

Departure Evaluation:

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This Departure is associated with the details of implementing the Human Performance Monitoring Program. The additions, deletions, and changes to the US EPR FSAR Section 18.12 have been evaluated and determined to not adversely affect the safety function of any SSC, procedures or analysis of the plant. 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 plantspecific FSAR being exceeded or altered; or 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;
8. 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 Post-DBA UHS Makeup Keep-Fill Piping, Valves, and flow restricting orifice for the UHS Makeup Water System design

Affected U.S. EPR FSAR Sections: Tier 2 Figure 9.2.5-1

Summary of Departure

The U.S. EPR Figure 9.2.5-1 does not contain a provision to compensate for the UHS Makeup Water System leakage and maintain the water level in the piping full at all times. The Post-DBA UHS Makeup Keep-Fill line is added to deliver makeup water to the UHS Makeup Water System to compensate for the leakage loss due to pressure boundary isolation valves, and to keep the UHS Makeup Water System piping full of water at all times. Therefore, the ESWS Emergency Makeup Water line piping and the ESW System return line piping are modified.

Scope/Extent of Departure:

This departure is identified in CCNPP Unit 3 Part 2 FSAR, Sections 1.8.2, 9.2.5.5, Figure 9.2-3, and Figure 9.2-10.

Departure Justification:

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The CCNPP Unit 3 site-specific UHS Makeup Water System wet layup configuration will require the system piping to be full of water at all times to ensure system readiness. And, makeup water is required to compensate for UHS Makeup Water System boundary valve leakage. In order to maintain water level in the piping and provide makeup water to offset valve seat leakage, a tie in point between ESWS Emergency Makeup Water piping and the ESW System return piping is provided. This tie in allows makeup water to enter the UHS Makeup Water System piping.

Departure Evaluation:

The UHS Makeup Water System pressure boundary is maintained through the safety-related Post-DBA UHS Makeup Keep-Fill line check valve.

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.

1.1.10 UHS Makeup Water Pump Starting Logic

Affected U.S. EPR FSAR Sections: Tier 2, Table 9.2.1-3, Alarm Summary, Cooling tower basin level Lo-Lo-Lo.

Summary of Departure:

The U.S. EPR FSAR Figure 9.2.1-3 contains a pump start permissive based on Cooling tower basin water level.

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The UHS Makeup Water System at CCNPP Unit 3 is a manually initiated system with no pump start interlocks or permissives based on UHS tower basin water level.

Scope/Extent of Departure:

This Departure is identified in the CCNPP Unit 3 FSAR Section 9.2.5.7.3.1.

Departure Justification:

The requirement to have a level below the normal operating band in order to start the UHS makeup pump could prevent or delay operator action to initiate the system's safety function. Operating procedures and operator judgment based on safety-related indications and alarms will determine the appropriate timing to initiate the UHS Makeup Water System.

Departure Evaluation:

The UHS Makeup Water System is started manually from the control room within 72 hours for the limiting design basis accidents. The UHS Makeup Water System is used to provide water to the UHS tower basins to mitigate accidents when the normal UHS makeup system is not available. Elimination of the UHS makeup water pump start permissive removes a potential limitation in starting the UHS makeup water pumps.

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;

In some abnormal events and severe accident conditions, starting of the UHS Makeup Water system at a higher basin level could be advantageous. Therefore, removal of the start permissive does not adversely impact resolution of a severe accident issue identified in the plant-specific FSAR.

Based on the above, this Departure has no safety significance.

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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.

Calvert Cliffs 3 Nuclear Project and UniStar Nuclear Operating Services request the following exemptions related to:

1. Maximum Tilt Settlement (across the basemat),
2. Accident Atmospheric Dispersion Factor (0-2 hour, Low Population Zone),
3. Use of M5™ Advanced Zirconium Alloy Fuel Rod Cladding, and
4. Shear Wave Velocity
5. Generic Technical Specifications and Bases - Setpoint Control Program
6. Special Nuclear Material (SNM) Material Control and Accounting (MC&A) Program Description [Part 70, Subpart D and Part 74 Subparts C, D, and E]

The exemption request associated with Use of M5™ 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 MAXIMUM TILT SETTLEMENT (ACROSS THE BASEMAT)

Applicable Regulation: 10 CFR Part 52

The U.S. EPR FSAR Tier 1 Table 5.0-1, Tier 2 Table 2.1-1, and Tier 2 Section 2.5.4.10.2 identify a maximum differential settlement of ½ inch in 50 feet (i.e., 1/1200) in any direction across the basemat. The estimated settlement values for the Emergency Generating Building foundations and Essential Service Water System Cooling Tower foundations exceed the U.S. EPR FSAR value.

Pursuant to 10 CFR 52.7 and 10 CFR 52.93, Calvert Cliffs 3 Nuclear Project, LLC, and UniStar Nuclear Operating Services, LLC, request an exemption from compliance with the U.S. EPR FSAR Tier 1 and 2 requirements associated with the maximum tilt settlement.

Discussion:

The estimated site-specific tilt settlement for the Emergency Power Generating Buildings and Essential Service Water System Cooling Towers (based on a fully flexible basemat) are 1/1166 and 1/845 (approximately ½ inch and ¾ inch in 50 ft), respectively, as stated in FSAR Section 2.5.4.10.2.

As described in Sections FSAR 3.8.5.5.2 and 3.8.5.5.3, finite element analyses were performed for the Emergency Power Generating Buildings and Essential Service Water System Cooling Towers using soil springs representing the CCNPP Unit 3 site. For each structure, the tilt settlement within the confines of the building periphery is shown to be substantially less than the 1/1200 (½ inch in 50 feet) requirement of the U.S. EPR FSAR.

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The variation of the finite element analysis tilt settlement with the estimated tilt settlements of Section 2.5.4.10.2 is attributed to the conventional geotechnical treatment of the foundation as a flexible plate, a condition much more conservative than the actual heavily stiffened (by deep reinforced concrete walls) 6′-0″ thick reinforced concrete Emergency Power Generating Building and Essential Service Water System Cooling Tower basemats.

Finite element analyses were also performed to evaluate the effects of overall Emergency Power Generating Building and Essential Service Water System Cooling Tower tilts of L/550 and L/600, respectively, where L is the least basemat dimension. For these analyses:

- Spring stiffnesses are adjusted to achieve a tilt of L/550,
- The elliptical distribution of soil springs is maintained,
- Soil spring stiffnesses along the basemat centerline (perpendicular to the direction of tilt) are retained, and
- Adjustment is made to all other springs as a function of the distance from the basemat centerline to the edges.

Bending moments from these finite element analyses confirm that an uncracked condition of the Emergency Power Generating Building and Essential Service Water System Cooling Tower basemats is maintained.

This change associated with the maximum tilt settlement of the Emergency Power Generating Building foundations and Essential Service Water System Cooling Tower foundations, 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 CCNPP Unit 3 Emergency Power Generating Building foundations and Essential Service Water System Cooling Tower foundations estimated settlement values exceed the U.S. EPR FSAR value. However, the CCNPP Unit 3 specific maximum tilt settlement of the Emergency Power Generating Building foundations and Essential Service Water System Cooling Tower foundations, 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.

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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, Calvert Cliffs 3 Nuclear Project, LLC, and UniStar Nuclear Operating Services, LLC, request approval of the requested exemption from compliance with the U.S. EPR FSAR Tier 1 and 2 requirements associated with maximum tilt settlement.

1.2.2 ACCIDENT ATMOSPHERIC DISPERSION FACTOR (0-2 HOUR, LOW POPULATION ZONE)

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 Accident Atmospheric Dispersion Factor (Low Population Zone) of $\leq$ 1.75E-4 sec/m^3. The corresponding CCNPP Unit 3 value is 2.151E-04 sec/m^3, as discussed in CCNPP Unit 3 FSAR Section 2.3.4, Site-Specific EAB/LPZ Accident χ/Q Values for Ground Level Releases.

Pursuant to 10 CFR 52.7 and 10 CFR 52.93, Calvert Cliffs 3 Nuclear Project, LLC, and UniStar Nuclear Operating Services, LLC, request an exemption from compliance with the U.S. EPR FSAR Tier 1 and 2 requirements associated with the 0-2 hour Accident Atmospheric Dispersion Factor (Low Population Zone).

Discussion:

The U.S. EPR FSAR identifies the 0-2 hour Accident Atmospheric Dispersion Factor (Low Population Zone) of $\leq$ 1.75E-4 sec/m^3. The corresponding CCNPP Unit 3 value is 2.151E-04 sec/m^3, as discussed in CCNPP Unit 3 FSAR Section 2.3.4, Site-Specific EAB/LPZ Accident χ/Q Values for Ground Level Releases. This CCNPP Unit 3 specific value exceeds the U.S. EPR FSAR value. As a result, the entire EAB/LPZ set of site specific Accident Atmospheric Dispersion Factors, including the Low Population Zone 0-2 hour at 1.5 miles χ/Q of 2.151E-04 sec/m^3, 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 CCNPP Unit 3 FSAR Chapter 15) were determined to be below the regulatory limits. Therefore, these changes will not result in a significant decrease in the level of safety otherwise provided by the design described in the U.S. EPR FSAR.

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

This change does not result in a departure from the design and does not require a change in the design described in the U.S. EPR FSAR. In addition, the Low Population Zone doses resulting from the associated CCNPP Unit 3 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 CCNPP Unit 3 specific value for the 0-2 hour Accident Atmospheric Dispersion Factor (Low Population Zone, 1.5 miles) exceeds the U.S. EPR FSAR value. However, the CCNPP Unit 3 specific 0-2 hour Accident Atmospheric Dispersion Factor (Low Population Zone, 1.5 miles), does not result in Low Population Zone doses that exceed regulatory limits. As such, application of the

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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, Calvert Cliffs 3 Nuclear Project, LLC, and UniStar Nuclear Operating Services, LLC, request approval of the requested exemption from compliance with the U.S. EPR FSAR Tier 1 and 2 requirements associated with the 0-2 hour Accident Atmospheric Dispersion Factor (Low Population Zone, 1.5 miles).

1.2.3 USE OF M5™ ADVANCED ZIRCONIUM ALLOY FUEL ROD CLADDING

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

Pursuant to 10 CFR 52.7 and 10 CFR 52.93, Calvert Cliffs 3 Nuclear Project, LLC, and UniStar Nuclear Operating Services, LLC, request 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 CCNPP Unit 3 fuel rod cladding and fuel assembly structural material.

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 CCNPP Unit 3 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 CCNPP Unit 3 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 CCNPP Unit 3 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 CCNPP Unit 3 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

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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 M5T^{M} 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 M5TM fuel rod cladding and fuel assembly structural material in the CCNPP Unit 3 core will not compromise safe operation of the reactor.

For these reasons, Calvert Cliffs 3 Nuclear Project, LLC, and UniStar Nuclear Operating Services, LLC, request 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.

1.2.4 Shear Wave Velocity

Applicable Regulation: 10 CFR Part 52

The U.S. EPR FSAR Tier 1 Table 5.0-1, and Tier 2 Table 2.1-1, identifies a minimum shear wave velocity (low strain best estimate average value at bottom of basemat) of 1,000 feet per second (fps).

The best estimate shear wave velocity in Fill layer 2, the fill from 6 feet below grade (the basemat of the Emergency Power Generating Building (EPGBs)) to 22 feet below grade is 900 fps. The best estimate shear wave velocity beneath the Essential Service Water Buildings (ESWBs) and the NI Common Basemat Structures is 1080 fps. Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC, are establishing acceptance criteria for shear wave velocity testing that are approximately one standard deviation less than the best estimate values, but greater than the lowest values used by the site-specific Soil-Structure Interaction (SSI) analysis. Establishing acceptance criteria greater than the lower bound but less than the best estimate value will ensure that the shear wave velocity testing demonstrates that the backfill has been properly graded and installed, while minimizing the potential for a false failure of the shear wave velocity due to small inconsistencies in the field measured data resulting in an average shear wave velocity that is within the bounds of the analysis, but less than the best estimate value from laboratory testing. Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC, have established that the shear wave velocity profile

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values of structural fill material for the CCNPP Unit 3 Seismic Category I and II structures, and the FP Building and FP Tanks, are greater than or equal to 1000 fps at depths of 41.5 ft or greater, greater than or equal to 845 fps at depths greater than or equal to 22 ft and less than 41.5 ft, greater than or equal to 720 fps for depths greater than or equal to 6 ft and less than 22 ft, and greater than or equal to 650 fps for depths greater than or equal to 0 ft and less than 6 ft. Since some of these values are less than 1,000 fps, this constitutes a departure.

Therefore this U.S. EPR criterion is not met.

Pursuant to 10 CFR 52.7 and 10 CFR 52.93, Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC request an exemption from compliance with the U.S. EPR FSAR Tier 1 and 2 requirements associated with the minimum shear wave velocity.

Discussion:

The U.S. EPR FSAR identifies a minimum shear wave velocity (low strain best estimate average value at bottom of basemat) of 1,000 fps in Tier 1, Table 5.0-1. U.S. EPR FSAR Tier 1 Section 5.0 also states:

> In the case of seismic design parameters, deviations from the defined conditions may be justified by site-specific soil-structure interaction analyses. The results may be used to confirm the seismic design adequacy of the certified design using approved methods and acceptance criteria.

This 1,000 fps requirement, without identifying specific structures, is repeated in Table 2.1-1 of Tier 2. Section 2.5.2.6, *Ground Motion Response Spectrum*, of the U.S. EPR FSAR states that the applicant will confirm that the low-strain, best-estimate, value of shear wave velocity at the bottom of the foundation basemat of the Nuclear Island (NI) Common Basemat Structures is 1,000 fps, or greater.

U.S. EPR FSAR Section 2.5.4.3, *Foundation Interfaces*, specifies the following requirement with respect to shear wave velocity:

> (4) adequate dynamic properties (i.e., shear wave velocity and strain-dependent modulus-reduction and hysteretic damping properties) to support the Seismic Category I structures of the U.S. EPR under earthquake loading.

The fill selected for CCNPP Unit 3 is competent material. It has a moist unit weight of 145 lb/ft^3 and an angle of internal friction of more than 40°. Both of these values exceed the U.S. EPR established criteria. Shear wave velocity is a function of both the material and the confining pressure of the overlying soils (or structures). Because of the lack of confining pressure, a best estimate shear wave velocity of 1,000 fps or more is unlikely to be obtained immediately below a shallow foundation structure.

The site-specific Soil-Structure Interaction (SSI) analysis performed for FSAR Section 3.7 establishes a range of acceptable shear wave velocities beneath the ESWBs, EPGBs, and the NI Common Basemat Structures. The lowest acceptable shear wave velocity is the best estimate minus one standard deviation. This analysis demonstrates that the ESWBs, EPGBs, and the NI Common Basemat Structures withstand the safe shutdown earthquake (SSE) for that range of shear wave velocities.

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Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) testing will be performed during construction to confirm that the shear wave velocity of the installed and compacted fill exceeds thebest estimate minus one standard deviation shear wave velocity used in the FSAR Section 3.7 analysis. This ITAAC testing demonstrates acceptability of this aspect of the building seismic analysis.

This change associated with the shear wave velocity below the EPGBs, ESWBs, and the NI Common Basemat Structures 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 fill below the EPGBs, ESWBs, and the NI Common Basemat Structures may not always meet the minimum shear wave velocity of 1,000 fps identified in the U.S. EPR FSAR. However, the EPGBs, ESWBs, and the NI Common Basemat Structures have been evaluated using the properties of the existing soil column and the selected fill and the lower shear wave velocity of the fill has been 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, Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC request approval of the requested exemption from compliance with the U.S. EPR FSAR Tier 1 and 2 requirements associated with shear wave velocity.

1.2.5 General Technical Specification and Bases - Setpoint Control Program

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, Calvert Cliffs 3 Nuclear Project, LLC, and UniStar Nuclear Operating Services, LLC, request 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.

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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 reviewed and approved by the NRC. Bases descriptions will be revised, as necessary.

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

As discussed in COLA Part 7, Section 1.1, this change results in a departure from the design as described in the U.S. EPR FSAR. The change has been evaluated and determined to not adversely affect the safety function of the associated structures, systems, components, reactor trip or Engineered Safety Features functions. Therefore, the requested departure and 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 departure and 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 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.

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

For these reasons, Calvert Cliffs 3 Nuclear Project, LLC, and UniStar Nuclear Operating Services, LLC, request 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.

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1.2.6 Special Nuclear Material (SNM) Material Control and Accounting (MC&A) Program Description [Part 70, Subpart D and Part 74, Subparts C, D, and E]

Pursuant to 10 CFR 52.7 and 10 CFR 52.93, Calvert Cliffs 3 Nuclear Project, LLC, and UniStar Nuclear Operating Services, LLC, request an exemption from the requirements of 10 CFR 70.22(b), Contents of applications , 70.32(c), Conditions of licenses , 74.31, Nuclear material control and accounting for special nuclear material of low strategic significance, 74.41, Nuclear material control and accounting for special nuclear material of moderate strategic significance , and 74.51, Nuclear material control and accounting for strategic special nuclear material. This exemption request is related to the application of the exemptions described in these sections to nuclear reactors licensed pursuant to 10 CFR Part 52, in addition to the exemption already stated for 10 CFR Part 50.

Specific wording from which exemption is requested:

10 CFR 70.22(b), Contents of applications:

(b) Each application for a license to possess special nuclear material, to possess equipment capable of enriching uranium, to operate an uranium enrichment facility, to possess and use at any one time and location special nuclear material in a quantity exceeding one effective kilogram, except for applications for use as sealed sources and for those uses involved in the operation of a nuclear reactor licensed pursuant to part 50 of this chapter and those involved in a waste disposal operation, must contain a full description of the applicant's program for control and accounting of such special nuclear material or enrichment equipment that will be in the applicant's possession under license to show how compliance with the requirements of 10 CFR 74.31, 74.33, 74.41, or 74.51 of this chapter, as applicable, will be accomplished. 10 CFR 70.32, Conditions of licenses:

(c) (1) Each license authorizing the possession and use at any one time and l l location of uranium source material at an uranium enrichment facility or special nuclear material in a quantity exceeding one effective kilogram, except for use as sealed sources and those uses involved in the operation of a nuclear reactor licensed pursuant to part 50 of this chapter and those involved in a waste disposal operation, shall contain and be subject to a condition requiring the licensee to maintain and follow:

(i) The program for control and accounting of uranium source material at an uranium enrichment facility and special nuclear material at all applicable facilities as implemented pursuant to 10 CFR 70.22(b), or 10 CFR 74.31(b), 74.33(b), 74.41(b), or 74.51(c) of this chapter, as appropriate;

(ii) The measurement control program for uranium source material at an uranium enrichment facility and for special nuclear material at all applicable facilities as implemented pursuant to 10 CFR 74.31(b), 74.33(b), 74.45(c), or 74.59(e) of this chapter, as appropriate; and

(iii) Other material control procedures as the Commission determines to be essential for the safeguarding of uranium source material at an uranium enrichment facility or of special nuclear material and providing that the licensee shall make no change that would decrease the effectiveness of the material control and accounting program implemented pursuant to 10 CFR 70.22(b), or 10

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CFR 74.31(b), 74.33(b), 74.41(b), or 74.51(c) of this chapter, and the measurement control program implemented pursuant to 10 CFR 74.31(b), 74.33(b), 74.41(b), or 74.59(e) of this chapter without the prior approval of the Commission. A licensee desiring to make changes that would decrease the effectiveness of its material control and accounting program or its measurement control program shall submit an application for amendment to its license pursuant to 10 CFR 70.34.

10 CFR 74.31, Nuclear material control and accounting for special nuclear material of low strategic significance:

General performance objectives. Each licensee who is authorized to possess and use more than one effective kilogram of special nuclear material of low strategic significance, excluding sealed sources, at any site or contiguous sites subject to control by the licensee, other than a production or utilization facility licensed pursuant to part 50 or 70 of this chapter, or operations involved in waste disposal, shall implement and maintain a Commission approved material control and accounting system that will achieve the following objectives

10 CFR 74.41, Nuclear material control and accounting for special nuclear material of moderate strategic significance:

(a) General performance objectives. Each licensee who is authorized to possess special nuclear material (SNM) of moderate strategic significance or SNM in a quantity exceeding one effective kilogram of strategic special nuclear material in irradiated fuel reprocessing operations other than as sealed sources and to use this material at any site other than a nuclear reactor licensed pursuant to part 50 of this chapter; or as reactor irradiated fuels involved in research, development, and evaluation programs in facilities other than irradiated fuel reprocessing plants; or an operation involved with waste disposal, shall establish, implement, and maintain a Commission-approved material control and accounting (MC&A) system that will achieve the following performance objectives:

10 CFR 74.51, Nuclear material control and accounting for strategic special nuclear material:

(a) General performance objectives. Each licensee who is authorized to possess five or more formula kilograms of strategic special nuclear material (SSNM) and to use such material at any site, other than a nuclear reactor licensed pursuant to part 50 of this chapter, an irradiated fuel reprocessing plant, an operation involved with waste disposal, or an independent spent fuel storage facility licensed pursuant to part 72 of this chapter shall establish, implement, and maintain a Commission-approved material control and accounting (MC&A) system that will achieve the following objectives:

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

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consistent with common defense and security, and 4) special circumstances, as defined in 10 CFR 50.12(a)(2) are present. The requested exemptions to allow the applicability of the exemptions described in these sections to nuclear reactors licensed pursuant to 10 CFR Part 52, in addition to the exemption stated for 10 CFR Part 50, for CCNPP Unit 3 satisfies these requirements as described below.

CC3 requests an exemption from the requirements of 10 CFR 70.22(b) and, in turn, 10 CFR 70.32(c), 74.31, 74.41, and 74.51. Section 70.22(b) requires an application for a license for special nuclear material to contain a full description of the applicant's program for material control and accounting (MC&A) of special nuclear material under 10 CFR 74.31, 74.33, 74.41, and 74.512. Section 70.32(c) requires a license authorizing the use of special nuclear material to contain and be subject to a condition requiring the licensee to maintain and follow a special nuclear material control and accounting program, measurement control program, and other material control procedures, including the corresponding records management requirements. However, 10 CFR 70.22(b), 70.32(c), 74.31, 74.41, and 74.51 contain exceptions for nuclear reactors licensed under 10 CFR Part 50. The regulations applicable to the MC&A of special nuclear material for nuclear reactors licensed under 10 CFR Part 50 are provided in 10 CFR Part 74, Subpart B, 10 CFR 74.11 through 74.19, excluding 10 CFR 74.17. The purpose of this exemption request is to seek a similar exception for this combined license (COL) under 10 CFR Part 52, such that the same regulations will be applied to the special nuclear material MC&A program as nuclear reactors licensed under 10 CFR Part 50.

Nuclear reactors licensed under Part 50 are explicitly excepted from the requirements of 10 CFR 70.22(b), 70.32(c), 74.31, 74.41, and 74.51. There is no technical or regulatory reason to treat nuclear reactors licensed under Part 52 differently than reactors licensed under Part 50 with respect to the MC&A provisions in 10 CFR Part 74. As indicated in the Statement of Considerations for 10 CFR § 52.0(b) (72 Fed. Reg. 49352, 49372, 49436 (Aug. 28, 2007)), applicants and licensees under Part 52 are subject to all of the applicable requirements in 10 CFR Chapter I, whether or not those provisions explicitly mention a COL under Part 52. This regulation clearly indicates that plants licensed under Part 52 are to be treated no differently than plants licensed under Part 50 with respect to the substantive provisions in 10 CFR Chapter I (which includes Parts 70 and 74). In particular, the exception for nuclear reactors licensed under Part 50, as contained in 10 CFR 70.22(b), 70.32(c), 74.31, 74.41, or 74.51, should also be applied to reactors licensed under Part 52.

An exemption from the requirements of 10 CFR 70.22(b), 70.32(c), 74.31, 74.41, and 74.51 would not mean that a MC&A program would be unnecessary or that the COL application would be silent regarding MC&A. To the contrary, the MC&A requirements in Subpart B to Part 74 would still be applicable to the COL just as they are to licenses issued under Part 50. Additionally, the COL application will describe the MC&A program for satisfying Subpart B to Part 74.

This exemption request is evaluated under 10 CFR 52.7, which incorporates the requirements of 10 CFR 50.12. That section allows the Commission to grant an exemption if 1) the exemption is authorized by law, 2) will not present an undue risk to the public health and safety, 3) is consistent with the common defense and security, and 4) special circumstances are present as specified in 10 CFR § 50.12(a)

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(2). The criteria in § 50.12 encompass the criteria for an exemption in 10 CFR 10 CFR 70.17(a) and 74.7, the specific exemption requirements for Parts 70 and 74, respectively. Therefore, by demonstrating that the exemption criteria in 10 CFR 50.12 are satisfied, this request also demonstrates that the exemption criteria in 10 CFR 52.7, 70.17(a) and 74.7 are satisfied.

Evaluation Against Exemption Criteria

1. This exemption is not inconsistent with the Atomic Energy Act or any other statute and is therefore authorized by law.

2. An exemption from the requirements of 10 CFR 10 CFR 70.22(b), 70.32(c), 74.31, 74.41, and 74.51 would not present an undue risk to public health and safety. The exemption would treat the COL applicant similarly to Part 50 license applicants, who are excepted from the regulations in question. Furthermore, the COL application will contain a description of the applicant's MC&A program under Subpart B to Part 74. Therefore, the exemption from 10 CFR 10 CFR 70.22(b), 70.32(c), 74.31, 74.41, and 74.51 would not present an undue risk to public health and safety.

3. An exemption from the requirements of 10 CFR 10 CFR 70.22(b), 70.32(c), 74.31, 74.41, and 74.51 would not be inconsistent with the common defense and security. The exemption would treat the COL applicant similarly to Part 50 license applicants, who are excepted from the regulations in question. Furthermore, the COL application will contain a description of the applicant's MC&A program under Subpart B to Part 74. Therefore, the exemption from 10 CFR 70.22(b), 70.32(c), 74.31, 74.41, and 74.51 is consistent with the common defense and security.

4. The exemption request involves special circumstances under 10 CFR 10 CFR 50.12(a)(2)(ii). That subsection defines special circumstances as when "[a]pplication of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule." Since the Commission determined that the requirements in 10 CFR 10 CFR 70.22(b), 70.32(c), 74.31, 74.41, and 74.51 are unnecessary for Part 50 applicants, those requirements are also unnecessary for Part 52 applicants.

As demonstrated above, the exemption complies with the requirements of 10 CFR 10 CFR 50.12, 52.7, 70.17, and 74.7. For these reasons, approval of the requested exemption is requested from the regulations of 10 CFR 10 CFR 70.22(b), 70.32(c), 74.31, 74.41, and 74.51, as described herein.

For these reasons, Calvert Cliffs 3 Nuclear Project, LLC, and UniStar Nuclear Operating Services, LLC, request an exemption from the requirements of 10 CFR 70.22(b), Contents of applications , 70.32(c), Conditions of licenses , 74.31, Nuclear material control and accounting for special nuclear material of low strategic

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significance, 74.41, Nuclear material control and accounting for special nuclear material of moderate strategic significance , and 74.51, Nuclear material control and accounting for strategic special nuclear material.

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