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LIST OF FIGURES

No figures were included in this chapter.

LIST OF TABLES

No tables were included in this chapter.

16 TECHNICAL SPECIFICATIONS

16.1 Introduction

The Calvert Cliffs Nuclear Power Plant (CCNPP), Unit 3, combined license (COL) application is the reference COL for the U.S. EPR design. The U.S. EPR Final Safety Analysis Report (FSAR) Tier 2, Chapter 16, technical specifications (TS) are the generic TS (GTS) for all U.S. EPR applicants, and the CCNPP Unit 3 plant-specific TS (PTS) will serve as the standard TS (STS) for all subsequent U.S. EPR applicants.

The co-applicants for CCNPP Unit 3 are Calvert Cliffs Nuclear Project LLC and UniStar Nuclear Operating Services, LLC (hereafter referred to as the COL applicant). The CCNPP Unit 3 PTS were provided by the COL applicant for NRC review and approval in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50 Section 36, "Technical Specifications," and 10 CFR 50.36a, "Technical Specifications on Effluents from Nuclear Power Reactors."

This safety evaluation report documents the staff's review of the PTS and Bases for acceptability, correctness and completeness with regard to NRC requirements and guidance, technical content, and consistency with U.S. EPR GTS and Bases.

The staff reviewed the information in U.S. EPR FSAR Tier 2, Chapter 16 on Docket No. 52-020. The results of the staff's technical evaluation of the information related to technical specifications incorporated by reference in the COL application (i.e., COL FSAR (Part 2) and PTS (Part 4)) have been documented in the staff's safety evaluation report (SER) on the design certification application for the U.S. EPR. The Safety Evaluation Report (SER) on the U.S. EPR is not yet complete. **Request for additional information (RAI) 222, Question 01-5 is being tracked as an open item** for this chapter. The staff will update Chapter 16 of this report to reflect the final disposition of the design certification application

16.2 Summary of Application

COL FSAR Chapter 16 incorporates by reference U.S. EPR FSAR Tier 2, Chapter 16.

In addition, in COL FSAR Section 16.0, the COL applicant provided the following:

Combined License Information Items

The COL applicant provided additional information in COL FSAR Section 16.0 to address COL Information Item No. 16.0-1 from U.S. EPR FSAR Tier 2, Table 1.8-2 as follows:

Reviewer's Notes and brackets are used to identify information or parameters that are plant-specific or are based on preliminary design information. A COL applicant that references the U.S. EPR design certification will provide the necessary information in response to the Reviewer's Notes and replace preliminary information provided in brackets of the Technical Specifications and Technical Specification Bases with plant specific values.

In response to this COL information item, the COL applicant stated that the U.S. EPR GTS and Bases, provided in U.S. EPR FSAR Tier 2, Chapter 16, are incorporated by reference.

The COL applicant has provided the PTS and Bases as part of its COL application in Part 4, summarized here, in part, as follows:

In accordance with 10 CFR 50.36(c), TS shall include safety limits (SLs), limiting safety system settings (LSSSs), and limiting control settings. Safety limits for nuclear reactors are the limits placed upon important process variables that are necessary to reasonably protect the physical barriers that guard against the uncontrolled release of radioactive material. If any of these limits are exceeded, the reactor must be shutdown. Limiting safety system settings are settings for automatic protective devices related to those variables having significant safety functions. These setting are so chosen to allow automatic protective devices to correct an abnormality before a safety limit is exceeded. Limiting control settings apply to fuel reprocessing plants and are not applicable to this review.

The PTS contain limiting conditions for operation (LCOs), applicability determination, remedial actions, and surveillance requirements (SRs). LCOs specify the lowest functional capability or performance levels of equipment required for safe operation of a nuclear facility. If these conditions are not met, the licensee is required to take remedial actions permitted by the TS or shutdown. Applicability identifies when an LCO is in effect and has to be met, usually in terms of Mode(s) of Operation and thermal power. Actions include the condition(s) that defines the anticipated method(s) in which the requirements of the LCO can fail to be met. Specified with each of these identified conditions are required actions, the actions that must be met in response to the corresponding condition; and the completion time, the time limit to complete the required action. Each SR is briefly described and has a specified frequency in which the surveillance must be satisfactorily performed in order to meet the associated LCO.

In addition to the PTS, the PTS Bases contain summary statements of the bases or reasons for such specifications, as applicable, and include background information, applicable safety analyses, LCO, applicability, actions, SRs, and references. In accordance with 10 CFR 52.47(a)(2), the descriptions provided in the COL Bases document shall be sufficient to permit an understanding of the system designs and their relationship to the safety evaluations. Such items as the reactor core, reactor coolant system (RCS), instrumentation and control systems, electrical systems, containment system, other engineered safety features, auxiliary and emergency systems, power conversion systems, radioactive waste handling systems, and fuel handling systems shall be discussed insofar as they are pertinent.

U.S. EPR FSAR Tier 2 Departure

As identified in COL application, Part 4, Section A, Generic Change Items 1, 15, and 16 and in COL application, Part 7, Section 1.1.6:

A Setpoint Control Program (SCP) is adopted in the CCNPP Unit 3 Technical Specifications (TS). TS 3.3.1 is revised to delete the associated Reviewer's Notes and bracketed information. Applicable Surveillance Requirements and footnotes are revised to reference the SCP. Numerical setpoints are removed and replaced with a reference to the SCP. TS 5.5 is revised to delete the associated Reviewer's Note. Also, a SCP description will be added to the Administrative Controls - Programs and Manuals section (5.5). The SCP description references the NRC approved setpoint methodology documents that shall be used for the development of required numerical setpoints. The TS Bases 3.3.1 are revised to delete the associated Reviewer's Note, incorporate additional background information, and clarify the applicability of the program to certain specific functions.

The COL applicant requested this departure because certain plant-specific setpoints cannot be determined until after the selection of instrumentation and until the required as-built system design information is available, which may not occur until after the COL is granted. The COL applicant stated that this departure is consistent with NRC policy which allows an applicant to relocate numerical values out of the TS and replace them with an administrative program that references NRC-approved methodologies for determining these values.

16.3 Regulatory Basis

The regulatory basis of the information incorporated by reference is addressed within the Final Safety Evaluation Report (FSER) related to the U.S. EPR FSAR.

In addition, the relevant requirements of NRC regulations for technical specifications, and the associated acceptance criteria, are specified in NUREG-0800, Section 16, "Technical Specifications."

The applicable regulatory requirements for technical specifications are as follows:

1. 10 CFR 50.36 and 10 CFR 50.36a as they relate to the TS as discussed in No. 3 below.
2. 10 CFR 52.47(a)(11) and 10 CFR 52.79(a)(30) as they relate to the TS as discussed in No. 3 below.
3. In 10 CFR 50.36, the NRC established its regulatory requirements relating to the content of TS. In doing so, the Commission placed emphasis on those matters relating to the prevention of accidents and the mitigation of accident consequences. As stated in the Statements of Consideration, "Technical Specifications for Facility Licenses; Safety Analysis Reports" (33 *Federal Register* (FR) 18610, December 17, 1968), applicants are expected to incorporate into their TS "those items that are directly related to maintaining the integrity of the physical barriers designed to contain radioactivity." Consistent with this position, 10 CFR 50.36(c) requires that TS contain (1) safety limits and limiting safety system settings, (2) limiting conditions for operation, (3) surveillance requirements, (4) design features, and (5) administrative controls.
4. 10 CFR 50.36(c)(2)(ii) requires the TS to include an LCO for each item meeting one or more of the following four criteria:
 - Criterion 1: Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary (RCPB).
 - Criterion 2: A process variable, design feature, or operating restriction that is an initial condition of a design-basis accident (DBA) or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.
 - Criterion 3: A structure, system, or component (SSC) that is part of the primary success path and which functions or actuates to mitigate a design-basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

- Criterion 4: An SSC shown by operating experience or a probabilistic safety assessment to be significant to public health and safety.
- Note: According to 10 CFR Part 50, Appendix A, “General Design Criteria for Nuclear Power Plants,” General Design Criterion (GDC) 17, “Electric Power Systems,” GDC 21, “Protection System (PS) Reliability and Testability,” GDC 34, “Residual Heat Removal,” GDC 35, “Emergency Core Cooling,” GDC 38, “Containment Heat Removal,” GDC 41, “Containment Atmosphere Cleanup,” and GDC 44, “Cooling Water,” those SSCs shown to be significant to public health and safety need to have sufficient independence, redundancy, and testability to perform their safety functions.

The related acceptance criteria are as follows:

1. SECY-93-067, “Final Policy Statement on TS Improvements for Nuclear Power Reactors,” July 22, 1993, as it relates to content of standard technical specifications (STS). Major revisions to the STS were published in 1995 (Revision 1), 2001 (Revision 2), and 2004 (Revision 3).
2. 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,” September 25, 2008, as it relates to evaluating the requested U.S. EPR FSAR Tier 2 departure.

16.4 Technical Evaluation

The staff reviewed COL FSAR Chapter 16 and checked the referenced design certification FSAR to ensure that the combination of the information in the U.S. EPR FSAR and the information in the COL FSAR represents the complete scope of required information relating to this review topic. The review confirmed that the information contained in the COL application and incorporated by reference addresses the required information relating to this chapter. U.S. EPR FSAR Tier 2, Chapter 16 has been reviewed by the staff under Docket No. 52-020. The staff’s technical evaluation of the information incorporated by reference related to technical specifications has been documented in the staff safety evaluation report on the design certification application for the U.S. EPR.

The staff’s review of the information contained in the COL FSAR is discussed as follows:

16.4.1 General

The staff reviewed the PTS and Bases to verify the accuracy and completeness of the proposed specifications and related bases, and to confirm the appropriateness of the restrictions imposed by the plant-specific TS to ensure that CCNPP Unit 3 will operate within its safety limits and limiting safety system settings as described in the COL application.

The staff compared the PTS and Bases with the U.S. EPR GTS and Bases, as well as with other STS as referenced in the COL application and U.S. EPR FSAR. The evaluation of the PTS and Bases and of any differences between the PTS and the referenced specifications is provided in Sections 16.4.2 through 16.4.15 of this report.

16.4.2 Use and Application

Introduction

PTS Section 1.0 provides the definitions for terms, explains the logic connectors, establishes the Completion Time convention, and defines the proper use and application of frequency requirements utilized throughout the PTS.

Evaluation

PTS Section 1.0 is identical to U.S. EPR GTS Section 1.0. There is no site-specific information that the COL applicant needed to provide to complete this section.

Summary

The information on Use and Application provided in PTS Section 1.0 is consistent with U.S. EPR GTS without any noted exception. Therefore, the staff finds PTS Section 1.0 acceptable.

16.4.3 Safety Limits

Introduction

PTS Section 2.0 and Bases Section B 2.0 include the requirements for "Safety Limits." Safety limits are used to ensure that the fuel design limits and the RCS boundary pressure limits are not exceeded during steady state conditions, normal operating transients, and anticipated operational occurrences (AOOs).

Evaluation

PTS Section 2.0 and Bases Section B 2.0 are identical to U.S. EPR GTS and Bases Section B 2.0. There is no site-specific information that the COL applicant needed to provide to complete this section.

Summary

The specifications and information on Safety Limits provided in PTS Section 2.0 and Bases Section B 2.0 are consistent with U.S. EPR GTS and Bases without any noted exception. Therefore, the staff finds PTS Section 2.0 acceptable.

16.4.4 Limiting Condition for Operation Applicability

Introduction

PTS Section 3.0 and Bases Section B 3.0 include the general provisions regarding determination of equipment operability and performance of SRs used throughout PTS Sections 3.1 through 3.9.

Evaluation

PTS Section 3.0 and Bases Section B 3.0 are identical to U.S. EPR GTS and Bases Section 3.0. There is no site-specific information that the COL applicant needed to provide to complete this section.

Summary

The specifications and information on Limiting Condition for Operation and Surveillance Requirement Applicability provided in PTS Section 3.0 and Bases Section B 3.0 are consistent with U.S. EPR GTS and Bases without any noted exception. Therefore, the staff finds PTS Section 3.0 acceptable.

16.4.5 Reactivity Control Systems

Introduction

PTS Section 3.1 and Bases Section B 3.1 include the requirements for plant equipment that are designed to reliably control reactivity changes and, under postulated accident conditions, ensure that the capability to cool the core is maintained.

Evaluation

In general, PTS Section 3.1 and Bases Section B 3.1 are identical to U.S. EPR GTS and Bases Section B 3.1. There is no site-specific information that the COL applicant needed to provide to complete this section.

Summary

The specifications and information on Reactivity Control Systems provided in PTS Section 3.1 and Bases Section B 3.1 are consistent with U.S. EPR GTS and Bases without any noted exception. Therefore, the staff finds PTS Section 3.1 acceptable.

16.4.6 Power Distribution Limits

Introduction

PTS Section 3.2 and Bases Section B 3.2 include requirements for plant equipment that are designed to reliably control core thermal limits and core power distribution consistent with the design safety analysis.

Evaluation

In general, PTS Section 3.2 and Bases Section B 3.2 are identical to U.S. EPR GTS and Bases Section 3.2. There is no site-specific information that the COL applicant needed to provide to complete this section.

Summary

The specifications and information on Power Distribution Limits provided in PTS Section 3.2 and Bases Section B 3.2 are consistent with U.S. EPR GTS and Bases without any noted exception. Therefore, the staff finds PTS Section 3.2 acceptable.

16.4.7 Instrumentation Systems

Introduction

PTS Section 3.3 and Bases Section B 3.3 include requirements for Instrumentation Systems that (1) initiate reactor trip and engineered safety features actuations, (2) provide information required by operators to perform manual actions specified in Emergency Operating Procedures, and (3) provide operators with the capability to place and maintain the plant in a safe-shutdown condition from a location outside the control room.

Evaluation

In general, PTS Section 3.3 and Bases Section B 3.3 closely model U.S. EPR GTS and Bases Section 3.3 in format and content. However, the staff did identify a number of differences requiring technical justification and clarification beyond what was provided in PTS Section 3.3 and Bases Section B 3.3. Additional information has been requested for each of the following items in order to evaluate the adequacy and completeness of the PTS Section 3.3 and Bases Section B 3.3. Details regarding the responses associated with RAI 95, Questions 16-1 through 16-17 are provided below.

In response to the requirements of 10 CFR 50.36(c)(1)(ii)(A), the COL applicant proposed an Administrative Controls Technical Specification for a SCP in lieu of specifying explicit values for the LSSS in the PTS. The PTS, Administrative Controls, Setpoint Control Program Specification (5.5.18), did not provide sufficient detail to ensure regulatory compliance with the requirements of 10 CFR 50.36(c)(1)(ii)(A). In RAI 95, Question 16-1, the staff requested that the COL applicant enhance the SCP Specification and evaluate an option to adopt a model specification that would facilitate the ability of the NRC to conclude that the SCP satisfies 10 CFR 50.36(c)(1)(ii)(A). In an August 14, 2009, response to RAI 95, Questions 16-1, the COL applicant provided a proposed revision to the SCP Specification. Although the revised SCP Specification closely adhered to the suggested model, the following items associated with the response required additional follow-up. The staff requested that the COL applicant address these items in follow-up RAI 190, Question 16-20.

- The fifth paragraph on Page 5 of the August 14, 2009, response to RAI 95, Question 16-1 states, "U.S. EPR FSAR Tier 2, Revision 1, Chapter 16 has been revised to include Reviewer's Notes that permit a COL applicant to utilize a SCP. Subsequent to the issuance of Revision 1 to the U.S. EPR FSAR, the U.S. EPR Protection System Technical Specifications (LCO 3.3.1) and Bases were revised and submitted in response to RAI Set 103 (ML091820006). As part of that submittal, changes were made to the Technical Specifications to facilitate adoption and NRC approval of a Setpoint Control Program." The Reviewer's Note information provided in the U.S. EPR GTS and Bases (Revision 1 and Interim Revision 2) allowing the optional approach of specifying a yet to be defined SCP Administrative Controls Technical Specification, instead of placing brackets around a fully developed SCP Administrative Controls TS with Surveillance Requirement or table references to the SCP TS, does not satisfy 10 CFR 52.47(a)(11). In an audit on August 13-14, 2009, between AREVA and the NRC, AREVA acknowledged the staff's position and agreed to remove the Reviewer's Notes from the U.S. EPR GTS and Bases. The COL applicant's response did not accurately reflect the fact that the Reviewer's Notes were invalid. In a December 11, 2009, response to follow-up RAI 190, Question 16-20 (Part A), the COL applicant revised its response to

correctly indicate that the Reviewer's Notes could not be utilized to facilitate adoption of an SCP in the CCNPP Unit 3 COLA. Subsequently, the staff verified that the Revision 2 update to Chapter 16 of the U.S. EPR FSAR removed the SCP Reviewer's Notes from the U.S. EPR TS. Therefore, the staff considers the issue associated with Part A of follow-up RAI 190, Question 16-20 resolved.

- Page 22 of the August 14, 2009, response to RAI 95, Question 16-1, includes an evaluation of the SCP departure as if it were a departure from U.S. EPR FSAR Tier 2 information. Departure from the U.S. EPR GTS will require staff approval via an exemption from the future Design Certification Rule (DCR). Therefore, the evaluation is unnecessary. In a December 11, 2009, response to follow-up RAI 190, Question 16-20 (Part B), the COL applicant deleted the proposed Tier 2 Departure Evaluation and added a new Exemption Request. The response was determined to be acceptable with the exception of (1) deletion of the SCP TS reference in the list of departures table included in Section 1.8.2, Departures, and (2) references to "Limiting Trip Setpoints and Design Limits," in Section 1.2, Exemption Requests, that may need to be revised to accurately reflect information in the U.S. EPR GTS, Table 3.3.1-2, which has not yet been finalized. In follow-up RAI 260, Question 16-22, the staff requested that the COL applicant address these items. RAI 260, Question 16-22 is being tracked as an open item.
- Revised Footnote (c) on Page 14 of the August 14, 2009, response to RAI 95, Question 16-1 (Plant-Specific Technical Specifications, Item "g") states, "The setpoint shall be reset to a value that is within the as-left tolerance around the LTSP at the completion of the surveillance; otherwise the division shall be declared inoperable." Step 5.5.18.c.5 of the proposed SCP Specification states, "The instrument division trip setting shall be set to a value within the specified ALT around the specified nominal trip setpoint (NTSP) (a trip setting as or more conservative than the specified LTSP) at the completion of the surveillance; otherwise, the surveillance requirement is not met and the instrument division shall be immediately declared inoperable." It was also noted that SCP Specification, Step 5.5.18.c.3, compares the as-found value of the instrument trip setting to the previous as-left value or the specified NTSP, not the LTSP. Inconsistencies exist between the referenced footnote and the proposed SCP Specification regarding the use of LTSP and NTSP. In a December 11, 2009, response to follow-up RAI 190, Question 16-20 (Part C), the COL applicant removed the inconsistencies by deleting Footnote (c) from PTS Table 3.3.1-2, thereby eliminating the reference to LTSP. Except for the LTSP reference, Footnote (c) guidance is redundant to that provided in the SCP Specification. Therefore, inclusion of Footnote (c) in PTS Table 3.3.1-2 is unnecessary on the basis of SCP incorporation. In public meetings on April 27, 2010, and April 28, 2010, between AREVA and the NRC, AREVA described the surveillance testing strategy proposed for the digital U.S. EPR Protection System, the basis of which is the performance of CALIBRATION surveillances limited solely to those analog components subject to drift. Based on information presented during the above referenced public meetings, the staff determined that revisions to the proposed SCP TS would be necessary, because the TS, as currently written, supports surveillance testing primarily for protection functions implemented via conventional analog bistables. In follow-up RAI 260, Question 16-22, the staff requested that the COL applicant address this item. **RAI 260, Question 16-22 is being tracked as an open item.**
- Discussion Item 8 on Page 11 of the August 14, 2009, response to RAI 95, Question 16-1 states, "...not all functions provide an automatic trip setpoint that protects

against violating the Reactor Core Safety Limits or Reactor Coolant System Pressure Safety Limit during AOOs (e.g., Control Room HVAC Reconfiguration to Recirculation Mode on High Intake Activity). The required Technical Specification automatic protection instrumentation functions are identified by the use of Footnotes (b) and (c) in the Limiting Trip Setpoint/Design Limit column in Table 3.3.1-2 of the U.S. EPR Technical Specifications.” In addition, Items f, g, h, i, j, k (PTS Bases Section 3.3.1) on pages 19 and 20 of the August 14, 2009, response to RAI 95, Question 16-1, identify Bases sections where the discussions have been revised to denote those functions for which LSSSs are not associated with safety limits. 10 CFR 50.36(c)(1)(ii)(A) requires that the TS include LSSSs for variables that have significant safety functions. For variables on which a SL has been placed, the LSSS value (SL LSSS) must be chosen to initiate automatic protective action to correct abnormal situations before the SL is exceeded. 10 CFR 50.36(c)(1)(ii)(A) also contains requirements for a general class of LSSSs; LSSSs related to variables having significant safety functions but which do not protect SLs (non-SL LSSS). All plant operating licenses have TS for LSSSs that are not related to SLs. For these LSSSs, 10 CFR 50.36(c)(1)(ii)(A) also requires that a licensee take appropriate action if it is determined that the automatic safety system does not function as required. The COL applicant’s use of footnotes and Bases statements to distinguish between functions with SL LSSSs and those with non-SL LSSSs is irrelevant to the scope of the SCP. Setpoints for SL-LSSS and non-SL LSSS functions alike are required to be included in the SCP. SCP requirements apply to all “significant safety function” LSSS values. In addition, Footnote (b) and (c) informational guidance is redundant to that provided in the SCP Specification, making inclusion of the footnotes in PTS Table 3.3.1-2 unnecessary. In a December 11, 2009, response to follow-up RAI 190, Question 16-20 (Part D), the COL applicant deleted (1) the LTSP/Design Limit column from PTS Table 3.3.1-2, (2) Footnotes (b) and (c) from PTS Table 3.3.1-2, and (3) the statements in the Bases that differentiated between those setpoints that are directly related to Safety Limits and those that are not. As a result of these changes, the COL applicant concluded that the setpoints for all U.S. EPR reactor trip and engineered safety features functions specified in the PTS, would be located in and subject to the requirements of the proposed SCP. The SCP TS requires that there be an NRC-approved instrumentation setpoint methodology for all automatic protection instrumentation setpoints related to variables having significant safety functions (SL and non-SL). Although the response documents the COL applicant’s claim that the instrumentation setpoints for all significant safety functions specified in the PTS will be subject to the requirements of the proposed SCP, it does not adequately address the staff’s concern regarding compliance with the SCP TS requirement that there be an NRC-approved instrumentation setpoint methodology for automatic protection setpoints related to non-SL variables having significant safety functions. In follow-up RAI 260, Question 16-22, the staff requested that the COL applicant address this item. **RAI 260, Question 16-22 is being tracked as an open item.**

- Item “e” (LCO 3.3.1, PTS) on Pages 13 and 14 of the August 14, 2009, response to RAI 95, Question 16-1, states, “Table 3.3.1-2 contains a ‘Limiting Trip Setpoint/Design Limit’ column. Where a numerical setpoint is provided in the Limiting Trip Setpoint/Nominal Value column in Table 3.3.1-2 (as opposed to a footnote), the numerical setpoint is being replaced with a new Footnote (w).” Footnote (w) reads “The Limiting Trip Setpoint / Nominal Value for this Trip / Actuation Function / Permissive is as specified in the Setpoint Control Program.” The COL applicant’s response did not address the fact that it would also be necessary to include Footnote (w) in the

referenced column of PTS Table 3.3.1-2 for Reactor Trip Functions (A.1.a, A.1.b, A.1.c, A.1.d, A.1.e, A.2) and ESFAS Functions (B.11.c, B.11.d, 12.a, 12.b), along with the already existing footnotes specifying the core operating limits report (COLR) and the pressure and temperature limits report (PTLR). Specifying Footnote (w) assignments as indicated ensures that the requirements of the SCP are applied to the setpoint values of the cited functions as well. In a December 11, 2009, response to follow-up RAI 190, Question 16-20 (Part E), the COL applicant (1) deleted Footnote (e), which references the COLR, in PTS Table 3.3.1-2, (2) deleted Footnote (v), which references the PTLR, in PTS Table 3.3.1-2, (3) decided that the new Footnote (w) would no longer be used in PTS Table 3.3.1-2, and (4) revised step 5.5.18.b of the proposed SCP TS to read "...shall be calculated in conformance with the instrumentation setpoint methodology previously reviewed and approved by the NRC as listed in Specifications 5.6.3, CORE OPERATING LIMITS REPORT (COLR), 5.6.4 PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR), ..." Specific references to the COLR and PTLR Specifications in step 5.5.18.b of the SCP TS, do not adequately address the requirement to specify the NRC-approved setpoint methodology used to determine the setpoint values for the automatic protection instrumentation functions in U.S. EPR GTS Table 3.3.1-2 delineated by footnotes stating (1) "As specified in the COLR," and (2) "As specified in the Pressure-Temperature Limits Report." The COLR and PTLR setpoint methodologies associated with the setpoint values for these functions must be approved by the NRC and need to be identified and specified explicitly in step 5.5.18.b of the SCP TS. In follow-up RAI 260, Question 16-22, the staff requested that the COL applicant address this item. **RAI 260, Question 16-22 is being tracked as an open item.**

- Step 5.5.18.c.2.iii of the COL applicant's proposed SCP Specification on Page 7 of the August 14, 2009, response to RAI 95, Question 16-1, revised the second parenthetical reference to "the specified ALT" in the NRC-suggested model SCP. The COL applicant's basis for the change as stated in Discussion Item 7 on Page 10 of the August 14, 2009, response to RAI 95, Question 16-1, reads, "The phrase 'the specified ALT' is used in parentheses twice in this paragraph. The second use was intended to clarify the uncertainties associated with the setting tolerance band." The changes made to the second parenthetical reference actually resulted in a description of the setting tolerance band, instead of providing the intended clarification regarding its uncertainties. In a December 11, 2009, response to follow-up RAI 190, Question 16-20 (Part F), the COL applicant resolved the issue by retaining the verbiage originally specified in the second parenthetical reference of step 5.5.18.c.2.iii of the NRC-suggested model SCP. Therefore, the issue associated with Part F of follow-up **RAI 190, Question 16-20 is being tracked as a confirmatory item.**

In RAI 95, Question 16-2, the staff requested that the COL applicant provide additional information regarding selection of the LTSP as the LSSS in the CCNPP Unit 3 PTS. In an August 14, 2009, response to RAI 95, Question 16-2, the COL applicant stated that the LTSP is the LSSS in the U.S. EPR design certification, citing the following statement from NRC-approved AREVA Topical Report ANP-10275P-A, "U.S. EPR Instrument Setpoint Methodology Topical Report": "The Limiting Trip Setpoint is the Limiting Safety System Setting since all known errors are appropriately combined in the total loop uncertainty calculation (TSTF-493)." The methodology described in Topical Report ANP-10275P-A will be used to establish technical specification setpoints for the U.S. EPR Protection System in accordance with the COL applicant's SCP. In follow-up RAI 190, Question 16-20 (16-2, Part A), the staff requested that the COL applicant provide the version of TSTF-493 referenced in the response

(e.g., WOG, BWOG, BWR4). In a December 11, 2009, response to follow-up RAI 190, Question 16-20 (16-2, Part A), the COL applicant stated that the information cited in TSTF-493, Revision 3, was part of the TSTF traveler generic discussion, and not associated with any specific reactor type. The staff determined that the COL applicant's position was acceptable based on the guidance provided in the TSTF-493, Revision 3, traveler and the fact that selection of the LTSP as the LSSS is permitted by current regulatory guidance, specifically, NRC Regulatory Issue Summary 2006-17, "NRC Staff Position On The Requirements of 10 CFR 50.36, 'Technical Specifications,' Regarding Limiting Safety System Settings During Periodic Testing And Calibration Of Instrument Channels." Therefore, the staff considers the issue associated with follow-up RAI 190, Question 16-20 (16-2, Part A) resolved.

In RAI 95, Question 16-6, the staff requested that the COL applicant provide additional information regarding the use of "Setting Basis" values (Analytical and Design Limits) in PTS Table 3.3.1-2, and that clarifying information be included in the Bases discussions to specify the limit type associated with each function. The additional information was requested on the basis that the "Setting Basis" approach (Analytical versus Design Limit) deviated from both the Westinghouse STS and the U.S. EPR GTS. In an August 14, 2009, response to RAI 95, Question 16-6, the COL applicant stated that the NRC cited difference between the GTS and the PTS regarding the use of "Setting Basis" values no longer exists because the departure from the U.S. EPR TS was removed as part of CCNPP Unit 3 COLA, Revision 4. The response also identified a number of significant safety functions whose associated LSSS values are not directly related to the protection of a safety limit (otherwise referred to as "Design Limit" by the COL applicant), apparently for the purpose of identifying LSSS setpoints to be excluded from the requirements of the SCP. The response specifically stated that these design limits were chosen without applying the setpoint methodology provided in the AREVA Topical Reports referenced in the proposed SCP. SCP requirements apply to all "significant safety function" LSSS values. The SCP TS requires that there be an NRC-approved instrumentation setpoint methodology for all automatic protection instrumentation setpoints related to variables having significant safety functions. This includes setpoints related to variables having significant safety functions on which a SL has been placed, and setpoints related to variables having significant safety functions but which do not protect Safety Limits in the PTS. Therefore, in follow-up RAI 191, Question 16-21, the staff requested that the COL applicant validate and confirm that the LSSS setpoints for all "significant safety functions" (SL LSSS and non-SL LSSS) specified in the PTS would be subject to the requirements of the proposed SCP. In a December 11, 2009, response to follow-up RAI 191, Question 16-21, the COL applicant deleted the PTS Bases statements that differentiated between SL and non-SL LSSS setpoints and stated that the instrumentation setpoints for all significant safety functions specified in the PTS would be subject to the requirements of the proposed SCP. The response did not adequately address the staff's concern regarding compliance with the SCP TS requirement that there be an NRC-approved instrumentation setpoint methodology for automatic protection setpoints related to non-SL variables having significant safety functions. This issue is being addressed by the open item associated with RAI 260, Question 16-22, as described in the above referenced discussion pertaining to RAI 95, Question 16-1 (fourth bulleted item). Therefore, the staff considers RAI 191, Question 16-21 closed.

In each of the August 14, 2009, responses to RAI No. 95, Questions 16-3 16-4, 16-9, 16-11, 16-13, and 16-14. the COL applicant stated that NRC cited differences between the U.S. EPR Technical Specifications and the COL application Technical Specifications no longer exist on the basis that (1) the departures from the U.S. EPR Technical Specifications were removed as part of the COL application, Revision 4, and (2) COL application, Part 4, does not revise the

Technical Specification information cited in the subject RAIs. No additional issues or concerns remain regarding any of these questions. Therefore, the staff considers the above referenced RAIs resolved.

- In each of the August 14, 2009, responses to RAI No. 95, Questions 16-5, 16-7, 16-8, and 16-10, the COL applicant stated that NRC cited differences between the U.S. EPR Technical Specifications and the COL application Technical Specifications no longer exist on the basis that (1) the departures from the U.S. EPR Technical Specifications were removed as part of the COL application, Revision 4, and (2) the contents of the Limiting Trip Setpoint/Design Limit column in COL application Part 4, Table 3.3.1-2, are being replaced as discussed in the August 14, 2009, response to RAI 95, Question 16-1. The issues associated with the subject RAIs are adequately addressed by removal of the departures and the response to RAI No. 95, Question 16-1, which removes LSSS setpoint values from LCO Table 3.3.1-2 as part of incorporating a SCP into the PTS. Therefore, the staff considers the the above referenced RAIs resolved.
- In each of the August 14, 2009, responses to RAI No. 95, Questions 16-12, 16-15, 16-16, and 16-17, the COL applicant stated that editorial corrections associated with the subject RAIs have been incorporated into Revision 1 of the U.S. EPR Technical Specifications and that (1) the departures from the U.S. EPR Technical Specifications were removed as part of COL application, Revision 4, and (2) COL application, Part 4, does not revise the Technical Specification information cited in the subject RAIs. Editorial corrections were verified to be properly incorporated into Revision 1 of the U.S. EPR FSAR. Therefore, the staff considers the above referenced RAIs resolved.

Summary

PTS Section 3.3 and Bases Section B 3.3 closely model U.S. EPR GTS and Bases Section 3.3, with some exceptions, most notably the incorporation of a SCP Administrative Controls technical specification. The staff is technically evaluating the differences identified herein between the PTS and U.S. EPR GTS Section 3.3, and the corresponding Bases. **Follow-up RAI 260, Question 16-22 is being tracked as an open item** to address the issues which have been identified. PTS Section 3.3 and the corresponding Bases will be revised to include any corrections, as appropriate. The remaining portions of PTS Section 3.3 and its corresponding Bases were found to be identical to U.S. EPR GTS Section 3.3 and Bases and, therefore, are acceptable to the staff.

16.4.8 Reactor Coolant System

Introduction

PTS Section 3.4 and Bases Section B 3.4 include requirements for the reactor coolant system parameters such as RCS pressure, temperature, flow, and specific activity; RCS subsystems, components, and parameters such as RCS loops, the pressurizer, and low-temperature overpressure protection (LTOP); and RCS leakage limits to ensure fuel integrity and reactor coolant pressure boundary integrity are preserved during all modes of plant operation.

Evaluation

PTS Section 3.4 and Bases Section B 3.4 are identical to U.S. EPR GTS and Bases Section 3.4. There is no site-specific information that the COL applicant needed to provide to complete this section.

Summary

The specifications and information on the Reactor Coolant System provided in PTS Section 3.4 and Bases Section B 3.4 are consistent with U.S. EPR GTS and Bases without any noted exception. Therefore, the staff finds PTS Section 3.4 acceptable.

16.4.9 Emergency Core Cooling Systems

Introduction

PTS Section 3.5 and Bases Section B 3.5 include requirements for the emergency core cooling systems, the safety-related equipment designed for emergency core safety injection, decay heat removal, and RCS emergency makeup and boration.

Evaluation

PTS Section 3.5 and Bases Section B 3.5 are identical to U.S. EPR GTS and Bases Section 3.5. There is no site-specific information that the COL applicant needed to provide to complete this section.

Summary

The specifications and information on Emergency Core Cooling Systems provided in PTS Section 3.5 and Bases Section B 3.5 are consistent with U.S. EPR GTS and Bases without any noted exception. Therefore, the staff finds PTS Section 3.5 acceptable.

16.4.10 Containment Systems

Introduction

PTS Section 3.6 and Bases Section B 3.6 include requirements for the containment systems, which are designed to contain fission products that may exist in the containment atmosphere following accident conditions.

Evaluation

PTS Section 3.6 and Bases Section B 3.6 are identical to U.S. EPR GTS and Bases Section 3.6. There is no site-specific information that the COL applicant needed to provide to complete this section.

Summary

The specifications and information on Containment Systems provided in PTS Section 3.6 and Bases Section B 3.6 are consistent with U.S. EPR GTS and Bases without any noted exception. Therefore, the staff finds PTS Section 3.6 acceptable.

16.4.11 Plant Systems

Introduction

PTS Section 3.7 and Bases Section B 3.7 include the requirements for other plant systems and components on the secondary-side of the plant (e.g., the main steam safety valves (MSSVs), the main steam isolation valves (MSIVs), the main feedwater (MFW) valves, emergency feedwater (EFW) system, etc.), the plant cooling water systems (e.g., component cooling water (CCW), essential service water system (ESWS), ultimate heat sink (UHS), etc.); spent fuel pool storage; and safety-related heating, ventilation and air conditioning (HVAC) systems).

Evaluation

PTS Section 3.7 and Bases Section B 3.7 are identical to U.S. EPR GTS and Bases Section 3.7 except for site-specific information provided to address COL information items as discussed below.

- U.S. EPR GTS Bases Section B 3.7.19 contains bracketed information regarding the makeup water source for the ultimate heat sink, the definition of operable makeup source, and its Seismic Category 1 structure necessary to support 30 days of post accident mitigation to be provided by potential applicants for construction permits or COLs. In PTS Bases Section B 3.7.8, the COL applicant provided additional details on the emergency makeup water sources for the UHS. Refer to Section 9.2.5 of this report for a technical evaluation of the new design details.
- U.S. EPR GTS Section 3.7.10 and the associated bases contain information regarding an assessment of a toxic gas release event to be addressed by potential applicants for construction permits or COLs. In PTS Section 3.7.10 and the associated Bases Section B 3.7.10, the COL applicant removed the Reviewer's Note and bracketed information regarding release of hazardous (toxic) gases based on a site-specific evaluation which shows that the toxic gas protection for the Control Room Envelope (CRE) is not required for CCNPP Unit 3. The staff has accepted this applicant's position as documented in Section 6.4 of this report.
- In PTS Section 5.5.17, the COL applicant removed information regarding release of hazardous (toxic) gases based on a site-specific evaluation which shows that the toxic gas release protection for the CRE is not required for CCNPP Unit 3. The staff has accepted this applicant's position as documented in Section 6.4 of this report.
- U.S. EPR GTS Bases Section B 3.7.12 contains a Reviewer's Note that requires commitments from the licensee regarding entry into Condition B for an inoperable radiological-controlled-area boundary to be addressed by potential applicants for construction permits or COLs. In PTS Bases Section B 3.7.12, the COL applicant reaffirmed commitments as outlined in U.S. EPR GTS Bases and removed the reviewer's note.
- The staff determined that the above actions acceptable, since they meet respective COL information requirements in the GTS and reflect the system design information in the noted FSAR Sections.

Summary

The specifications and information on Plant Systems provided in PTS Section 3.7 and Bases Section B 3.7 are consistent with U.S. EPR GTS and Bases. Except for the open item as discussed above, the staff finds PTS Section 3.7 acceptable.

16.4.12 Electric Power Systems

Introduction

PTS and Bases Section 3.8 includes requirements for the Electrical Power Systems that provide redundant, diverse and dependable power sources for all plant operating conditions. In the event of a total loss of offsite power, onsite diesel generators and batteries are provided to supply electrical power to equipment necessary for the safe shutdown of the plant.

Evaluation

PTS Section 3.8 and Bases Section B 3.8 model U.S. EPR GTS and Bases Section 3.8 in format and content. However, the staff did identify some minor editorial errors in the Bases Section B 3.8 which had not been previously identified during review of the U.S. EPR Bases. In RAI 95, Questions 16-18 and 16-19, the staff requested that the COL applicant provide the additional information necessary to correct the editorial errors in order to ensure the adequacy and completeness of Bases Section B 3.8. Details regarding the COL applicant's responses to RAI 95, Questions 16-18 and 16-19, are provided below.

In an August 14, 2009, response to RAI 95, Questions 16-18 and 16-19, the COL applicant stated that editorial corrections associated with RAI 95, Questions 16-18 and 16-19 have been incorporated into Revision 1 of the U.S. EPR Technical Specifications and that (1) the departures from the U.S. EPR Technical Specifications were removed as part of the COL application, Revision 4, and (2) COL application, Part 4, does not revise the Technical Specification information cited in the subject RAIs. Editorial corrections were verified to be properly incorporated into Revision 1 of the U.S. EPR FSAR. Therefore, the staff considers RAI 95, Questions 16-18 and 16-19 resolved.

Summary

Issues associated with minor editorial errors identified in Bases Section 3.8, which had not been previously identified during a review of U.S. EPR Bases, have been resolved. Consequently, PTS Section 3.8 and Bases Section B 3.8 and U.S. EPR GTS and Bases Section 3.8 are both identical and editorially correct. Therefore, the staff finds the PTS Section 3.8 and Bases Section B 3.8 acceptable.

16.4.13 Refueling Operations

Introduction

PTS Section 3.9 and Bases Section B 3.9 include requirements for boron concentration, nuclear instrumentation, containment penetrations, and water inventory in the refueling pool during Mode 6.

Evaluation

PTS Section 3.9 and Bases Section B 3.9 are identical to U.S. EPR GTS and Bases Section 3.9. There is no site-specific information that the COL applicant needed to provide to complete this section.

Summary

The specifications and information on Refueling Operations provided in PTS Section 3.9 and Bases Section B 3.9 are consistent with the U.S. EPR GTS and Bases without any noted exception. Therefore, the staff finds PTS Section 3.9 acceptable.

16.4.14 Design Features

Introduction

PTS Section 4.0 contains other design features not covered in the PTS Section 3 series. PTS Section 4.0 contains such information as site location, site maps, and other information related to core design and fuel storage design.

Evaluation

PTS Section 4.0 is identical to U.S. EPR GTS Section 4.0 except for site-specific information provided to address COL information items as discussed below.

- In PTS Section 4.1, the COL applicant replaced the bracketed information provided in U.S. EPR GTS Section 4.1, with site-specific information regarding the future location of CCNPP Unit 3. The staff finds the provided information acceptable, because they reflect the relevant information provided in COL FSAR, Section 2.1.

Summary

The information on Design Features provided in PTS Section 4.0, is consistent with U.S. EPR GTS Section 4, except as discussed above. Therefore, the staff finds PTS Section 4.0 acceptable.

16.4.15 Administrative Controls

Introduction

PTS Section 5.0 includes provisions which address various administrative controls related to key plant personnel responsibilities, plant procedures, special programs, reports, etc., to ensure the plant is safely operated.

Evaluation

PTS Section 5.0 is identical to U.S. EPR GTS Section 5.0 except for site-specific information provided to address COL information items as discussed below.

- In PTS Sections 5.1 and 5.2, the COL applicant replaced the bracketed information with site-specific information regarding key plant position titles to be consistent with the plant

organization structure described in COL FSAR Chapter 13, "Conduct of Operation." The staff finds the provided information acceptable, since they are administrative in nature and are consistent with relevant information provided in COL FSAR Section 13.1, "Organizational Structure of Applicant."

- In PTS Section 5.3, the COL applicant replaced the bracketed information with site-specific information regarding qualifications of unit staff members. The staff finds the provided information acceptable since they are consistent with relevant information provided in COL FSAR Sections 1.9, "Conformance with Regulatory Criteria," 13.1, and the plant quality assurance program description (QAPD) regarding training and qualification of plant staff personnel.
- In PTS Section 5.5.11, the COL applicant removed a reviewer's note regarding requirements for outdoor liquid radioactive waste storage tanks, based on the fact that the current CCNPP Unit 3 design will not include any outdoor liquid radioactive waste storage tanks. Based on this information, the staff finds this change acceptable.

In PTS Section 5.5.15, the COL applicant removed a reviewer's note regarding containment penetrations that are classified as bypass leakage paths, based on the fact that the current CCNPP Unit 3 design will not include containment penetrations classified as bypass leakage paths. Based on this information, the staff finds this change acceptable.

In PTS Section 5.5.17, the COL applicant removed information regarding release of hazardous (toxic) gases based on an applicant's site-specific evaluation which shows that the toxic gas release protection for the CRE is not required for CCNPP Unit 3. This issue will be evaluated in Section 6.4 of this report.

- In PTS Sections 5.6.1 and 5.6.2, the applicant removed reviewer's notes regarding annual reports for a multi-unit site, based on the fact that only one U.S. EPR unit is currently planned for the CCNPP site. Based on this information the staff finds this change acceptable.
- The COL applicant added a new PTS Section 5.5.18 to include the site-specific SCP and identified this change as a departure from the U.S. EPR GTS. Refer to Section 16.4.7 above for a complete evaluation of the SCP application to various plant instrument setpoints specified in TS Section 3.3.

Summary

The specifications on Administrative Controls provided in the PTS Section 5.0, are consistent with U.S. EPR GTS Section 5, except as discussed above. Therefore, the staff finds PTS Section 5.0 acceptable.

16.5 Post Combined License Activities

There are no post-COL activities related to this chapter.

16.6 Conclusions

The staff reviewed the COL application and checked the referenced U.S. EPR FSAR. The staff's review confirmed that the COL applicant addressed the required information relating to technical specifications, and there is no outstanding information expected to be addressed in the COL FSAR related to this section.

In addition, the staff reviewed the additional COL site-specific information in the CCNPP Unit 3 application against relevant NRC regulations (i.e., 10 CFR 50.36, 10 CFR 52.47(a)(11), and 10 CFR 52.79(a)(30)), acceptance criteria defined in NUREG-0800, Section 16.0, and other guidance and concludes that the applicant is in compliance with NRC regulations. Therefore, except for the open items discussed above the staff finds the PTS and Bases acceptable.