# 1.0 THE SOUTH TEXAS PROJECT PLANT

**TABLE OF CONTENTS**

# 1.0 THE SOUTH TEXAS PROJECT PLANT

## 1.1 Introduction

### 1.1.1 Introduction

On September 20, 2007 (Agency-wide Documents Access and Management System (ADAMS) Accession No. ML072830407), STP Nuclear Operating Company (STPNOC), pursuant to Sections 103 and 185b. of the Atomic Energy Act of 1954, as amended (AEA) and Title 10 of the Code of Federal Regulations (10 CFR) Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," Subpart C, submitted to the U.S. Nuclear Regulatory Commission (NRC) an application for Class 103 combined licenses (COLs) to construct and operate two new U.S. Advanced Boiling Water Reactor (ABWR) units designated as South Texas Project (STP) Units 3 and 4. On January 26, 2011 (ML110340451), Nuclear Innovation North America LLC (NINA or the applicant) submitted Revision 5 of the STP Units 3 and 4 COL application and identified a change in the lead applicant from STPNOC to NINA, effective January 24, 2011. The applicant also applied for the additional licenses that are required to possess and use source, special nuclear, and byproduct materials in connection with the construction and operation of the plant. The proposed units are to be built on the applicant's existing site in Matagorda County, Texas, about 90 miles southwest of Houston. STP Units 3 and 4 are to be co-located with STP Units 1 and 2, two existing pressurized water reactors.

The COL application incorporates by reference the ABWR (Docket No. 52-001), which is incorporated by reference in 10 CFR Part 52, Appendix A, "Design Certification Rule for the U.S. Advanced Boiling Water Reactor." The COL application also incorporates by reference the STPNOC amendment to the ABWR design certification to address the aircraft impact assessment (AIA) rule in 10 CFR 50.150. This STPNOC amendment was added to 10 CFR Part 52, Appendix A, on December 16, 2011 (76 FR 78119). The STPNOC amendment includes a separate design control document (DCD) focused on AIA issues that modifies and supplements the originally certified ABWR DCD.

The ABWR has a pressure suppression primary containment system that is comprised of the drywell and wetwell along with supporting systems. The ABWR has a rated thermal power of 3,926 megawatt thermal (MWt), and the generator will deliver a net electrical power of about 1,300 megawatt electrical (MWe).

The STP COL application is organized as follows:

- **Part 1, General and Financial Information,** provides an introduction to the application and includes certain corporate information pursuant to 10 CFR 50.33, "Contents of applications; general information."

- **Part 2, Final Safety Analysis Report (FSAR),** (1) incorporates the ABWR DCDs by reference; (2) includes Tier 1, Tier 2*, and Tier 2 departures from the DCDs; (3) addresses COL license information items, site parameters, and interface requirements; and (4) includes "supplemental information" to address required information not already addressed in the ABWR DCDs. The information in the FSAR is pursuant to the requirements of 10 CFR 52.79, "Contents of applications; technical information in final safety analysis report," and, in general, adheres to the content and format guidance in Regulatory Guide (RG) 1.206, ”Combined License Applications for Nuclear Power Plants (LWR Edition).”

- **Part 3, Environmental Report (ER),** provides information on the environmental impacts of constructing and operating new nuclear units at the STP site, pursuant to the requirements of 10 CFR 51.50(c).

- **Part 4, Technical Specifications (TS),** includes ABWR Generic Technical Specifications (TS) and Bases and the STP Units 3 and 4 site-specific TS and Bases.

- **Part 5, Emergency Plan,** provides site emergency plan and supporting information, such as evacuation time estimates and applicable offsite State and local emergency plans for the STP site.

- **Part 6** is a place holder for a possible future site redress plan.

- **Part 7, Departures Report,** includes “departures” and “exemptions” from the standard design described in the ABWR DCDs. In accordance with Section VIII, “Processes for Changes and Departures,” of 10 CFR Part 52, Appendix A, the applicant identifies and evaluates departures. Section 2 discusses departures requiring prior NRC approval, divided into Tier 1, Tier 2*, Tier 2, and TS departures from the approved ABWR DCD. Section 3 of Part 7 discusses Tier 2 departures that do not require prior NRC approval and are evaluated pursuant to the requirements of 10 CFR Part 52 Appendix A, Section VIII.B.5. In addition, to address some of the Tier 2 departures that do not require prior NRC approval, the staff engaged in 10 CFR Part 52 Appendix A, Section VIII.B.5 audits of the applicant (similar to the 10 CFR 50.59 process) (ML092510426 and ML093360537).

- **Part 8, Security/Training Qualification/Safeguards Plan**, includes security plan and safeguards information that is withheld from public disclosure.

- **Part 9, Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC)** includes ABWR DCD Tier 1 information and the STP Units 3 and 4 ITAAC arranged as follows: (1) Introduction, (2) Design Certification ITAAC, (3) Site-Specific ITAAC, (4) Emergency Planning ITAAC, and (5) Physical Security ITAAC.

- **Part 10**, Proprietary Information.

- **Part 11, Mitigative Strategies Report,** is required by 10 CFR 52.80(d). This section contains the applicant’s Mitigative Strategies Report. In 2009, the *Code of Federal Regulations* was changed to require applicants to include, in their application, a description and plans for implementation of the guidance and strategies intended to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities under the circumstances associated with the loss of large areas of the plant due to explosions or fire, as required by 10 CFR 50.54(hh)(2). The Mitigative Strategies Report addresses these requirements.

### 1.1.2 Summary of Application

Section 1.1 of the STP Units 3 and 4 COL FSAR Revision 12 incorporates by reference Section 1.1 of the certified ABWR DCD Revision 4, which is incorporated by reference in 10 CFR Part 52, Appendix A. Section 1.1 also incorporates by reference Section 1.1 of the STPNOC application to amend the design certification rule for the U.S. ABWR, “ABWR STP Aircraft Impact Assessment (AIA) Amendment,“ Revision 3, dated September 2010, (the AIA Amendment).

In addition, in COL FSAR Section 1.1, the applicant provides the following:

Format and Content:

This section contains general information regarding the format and content of the application. It also describes basic formatting conventions used in revising and supplementing the DCD; for example, the use of italicized text to indicate DCD information contained as a part of the FSAR.

Tier 2 Departures Not Requiring Prior NRC Approval

- STD DEP 1.1-1 Type of License Required

This departure recognizes that the ABWR DCD was submitted as a design certification, whereas the COL application was submitted as a Class 103 COL under 10 CFR Part 52.

- STP DEP 1.1-2 Dual Units at STP 3 & 4

This departure recognizes that the ABWR DCD is for a single unit, while the COL application is for two units that share certain systems.

- STP DEP 10.1-3 Rated Heat Balance

This departure revises the rated heat balance as a result of a change in the turbine design.

- STD DEP Vendor

This departure changes the text to remove the reference to General Electric (GE).

COL License Information Item

- COL License Information Item 1.1 Design Process to Establish Detailed Design Documentation

This COL license information item directs the COL applicant to provide the design process, which is necessary to establish the detailed design documentation. The applicant states that the project design process is fully described in the STP Units 3 and 4 Quality Assurance Program Description (QAPD). This QAPD was submitted as a part of the COL application and is referenced in FSAR Section 17.5S, “Quality Assurance Program Guidance.”

### 1.1.3 Regulatory Basis

The regulatory basis of the information incorporated by reference is in NUREG-1503, "Final Safety Evaluation Report [FSER] Related to the Certification of the Advanced Boiling-Water Reactor Design," (July 1994) (FSER related to the ABWR DCD). The regulatory basis of the AIA Amendment information incorporated by reference is in NUREG–1948, "Final Safety Evaluation Report Related to the Aircraft Impact Amendment to the U.S. Advanced Boiling Water Reactor (ABWR) Design Certification," dated October 2010 (the Safety Evaluation Report [SER] related to the AIA Amendment).

In addition, the relevant requirements of the Commission regulations for the introduction, and the associated acceptance criteria, are in Section 1.0, "Introduction and Interfaces," of NUREG–0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants, (LWR Edition)" (the Standard Review Plan [SRP]).

In accordance with Section VIII of 10 CFR Part 52, Appendix A, the applicant identifies Tier 2 departures that do not require prior NRC approval. These departures are subject to the requirements of 10 CFR Part 52 Appendix A Section VIII.B.5, which are similar to the requirements in 10 CFR 50.59.

<u>Applicable Regulations</u>

- 10 CFR Part 52, Subpart C, "Combined Licenses," sets forth the requirements and procedures applicable to the Commission's issuance of a COL for nuclear power facilities. The following requirements are of particular importance:

- 10 CFR 52.77, "Contents of applications; general information," requires the COL application to contain all information required by 10 CFR 50.33, "Contents of applications; general information."

- 10 CFR 52.79 provides requirements for the technical information that must be contained in the FSAR.

- 10 CFR 52.79(d) provides additional requirements for a COL referencing a standard certified design.

- 10 CFR 52.80, "Contents of applications; additional technical information," provides requirements for additional technical information outside of the FSAR (e.g., ITAAC and the environmental report).

- 10 CFR 52.81, "Standards for review of applications," provides standards for reviewing the application.

- 10 CFR 52.83, "Finality of referenced NRC approvals; partial initial decision on site suitability," provides for the finality of referenced NRC approvals (e.g., standard design certification and early site permits).

- 10 CFR 52.85, "Administrative review of applications; hearings," provides requirements for administrative reviews and hearings.

- 10 CFR 52.87, "Referral to the Advisory Committee on Reactor Safeguards (ACRS)," provides for referrals to the Advisory Committee on Reactor Safeguards (ACRS).

Finality of Referenced NRC Approvals

In accordance with 10 CFR 52.83, if the application for a COL references a design certification rule (DCR), the scope and nature of matters resolved for the application and any combined license issued are governed by the relevant provisions addressing finality. For the ABWR DCR, finality is specifically addressed by 10 CFR 52.63, "Finality of standard design certifications," and 10 CFR Part 52, Appendix A, Section VI, "Issue Resolution." Based on the finality afforded to referenced certified designs, the scope of this COL application review—as it relates to the referenced certified design—is primarily limited to ensuring that the COL applicant adequately addresses the identified COL license information items, site parameters, and interface requirements.

The contents of the FSAR are specified by 10 CFR 52.79(a), which requires the submission of information within the FSAR that describes the facility; identifies the design bases and the limits on its operation; and presents a safety analysis of the structures, systems, and components (SSCs) of the facility as a whole. For a COL application that references a design certification (DC), Section 52.79(d) requires the DCD to be included or incorporated by reference into the FSAR. Additionally, a COL application that references a DC must also contain the information and analysis required to be submitted within the scope of the COL application, but which is outside the scope of the DCD. This set of information addresses plant and site-specific information and includes all COL action or license information items; design information replacing conceptual design information; and programmatic information that was not reviewed and approved in connection with the design certification rulemaking. In addition, 10 CFR Part 52 Appendix A, Section IV.A.3 states that an applicant for a combined license shall include, in the plant specific DCD, the proprietary and safeguards information referenced in the ABWR DCDs.

The initial step in the NRC staff evaluation of the COL application is to confirm that the complete set of information required to be addressed within the COL application is addressed within the DC, as supplemented by the COL application, or is completely addressed within the COL application. Following this confirmation, the staff's review of the COL application is limited to the COL review items.

### 1.1.4 Technical Evaluation

As documented in NUREG–1503 and NUREG–1948, the NRC staff reviewed and approved Section 1.1 of the certified ABWR DCD and AIA Amendment. The staff reviewed Section 1.1 of the STP Units 3 and 4 COL FSAR and checked the referenced ABWR DCD and AIA Amendment to ensure that the combination of the information in the COL FSAR and the information in the ABWR DCD and AIA Amendment appropriately represents the complete scope of information relating to this review topic.[1]

[1] See *"Finality of Referenced NRC Approvals"* in SER Section 1.1.3, for a discussion on the staff's review related to verification of the scope of information to be included in a COL application that references a design certification.

The staff's review confirmed that the information in the application and the information incorporated by reference address the required information relating to the introduction.

The staff reviewed the following information in the COL FSAR:

Tier 2 Departures Not Requiring Prior NRC Approval

The following Tier 2 Departures not requiring NRC approval identified by the applicant in this section may also be addressed in other sections of this SER. For more information, refer to COL application Part 7, Section 5.0, "Tables and Indexes," for a listing of all FSAR sections affected by these departures.

- STD DEP 1.1-1 Type of License Required

This departure from the ABWR DCD asks for a Class 103 COL as opposed to a design certification. The applicant's evaluation in accordance with 10 CFR Part 52 Appendix A Section VIII.B.5, determined that this departure does not require prior NRC approval. Within the review scope of this section, the staff found it reasonable that the departure does not require prior NRC approval.

- STP DEP 1.1-2 Dual Units at STP 3 & 4

This departure from the ABWR DCD references a two-unit site as opposed to a one-unit site under the provisions of Section VIII.B.5 of Appendix A to 10 CFR Part 52. Within the review scope of this section, the staff found it reasonable that the departure does not require prior NRC approval.

- STP DEP 10.1-3 Rated Heat Balance

For this review section, the impact of this departure resulted in a revision to Figure 1.1-2, "Heat Balance at Rated Power." Within the review scope of this section, the staff found it reasonable that the departure does not require prior NRC approval.

- STD DEP Vendor

This departure removes the reference to GE as a vendor and supplier of the ABWR design. For the purposes of the staff's Section 1.1 review, the staff found it reasonable that the departure does not require prior NRC approval because it is editorial in nature. In addition, alternate vendor qualifications are addressed in Section 1.4S, Qualification of Alternate Vendor," of this SER.

The applicant's evaluation in accordance with 10 CFR Part 52 Appendix A Section VIII.B.5, determined that the above departures do not require prior NRC approval. Within the review scope of this section, the staff found it reasonable that these departures do not require prior NRC approval. In addition, the applicant's process for evaluating departures and other changes to the DCD is subject to NRC inspections.

COL License Information Item:

- COL License Information Item 1.1 Design Process to Establish Detailed Design Documentation

With regard to this COL license information item, the staff agrees that the QAPD is an appropriate place to describe the design process to establish detailed design documentation. The QAPD is evaluated in Chapter 17, "Quality Assurance," of this SER.

Supplemental Information

In order to meet the requirement of 10 CFR Part 52 Appendix A Section IV.A.3, for proprietary information, the applicant provides all proprietary information referenced in the ABWR DCD in Part 10 of the application. Section 13.6.3, "COL License Information," and Appendix 19C, "Design Considerations Reducing Sabotage Risk," of the STP Units 3 and 4 FSAR reference safeguards information referenced in the ABWR DCD. By letter dated October 18, 2010 (ML102930078), STPNOC confirms, by oath and affirmation, that it has possession of the referenced information and the right to use it in the licensing, design, construction and operation of STP Units 3 and 4. STPNOC also states that it is prepared to submit the referenced information if the NRC determines that to be desirable. The staff concluded that the applicant has met the requirements of 10 CFR Part 52 Appendix A, Section IV.A.3.

### 1.1.5 Post Combined License Activities

There are no post COL activities related to this section.

### 1.1.6 Conclusion

The NRC staff's finding related to information incorporated by reference is in NUREG–1503 and NUREG–1948. NRC staff reviewed the application and checked the referenced DCD and AIA Amendment. The staff's review confirmed that the applicant has addressed the required information, and no outstanding information is expected to be addressed in the COL FSAR related to this section. Pursuant to 10 CFR 52.63(a)(5) and 10 CFR Part 52 Appendix A Section VI.B.1, all nuclear safety issues relating to the introduction that were incorporated by reference have been resolved.

In addition, the staff concluded that the relevant information in the COL application is acceptable, satisfies NRC regulations, and meets the requirements defined in the ABWR DCD, and 10 CFR Part 52, Appendix A. The staff's conclusion is based on the following:

- For the purposes of the staff's Section 1.1 review, the staff found that, for all of the "Tier 2 Departures Not Requiring Prior NRC Approval" identified by the applicant, it is reasonable that they do not require prior NRC approval, per 10 CFR Part 52, Appendix A, Section VIII.B.5.

- Within the review scope of this section, the staff's review confirmed that the applicant has adequately addressed COL License Information 1.1 in accordance with Section 1.0, of NUREG–0800.

- The staff determined that the applicant has either provided the information or has contractual rights to the proprietary and safeguards information in the ABWR DCD in accordance with 10 CFR Part 52 Appendix A, Section IV.A.3.

# 1.2 General Plant Description

## 1.2.1 Introduction

This DCD section provides a short description of all major design components. Site-specific information is in the corresponding section of the STP Units 3 and 4 COL FSAR.

## 1.2.2 Summary of Application

Section 1.2 of the STP Units 3 and 4 COL FSAR Revision 12 incorporates by reference Section 1.2 of the certified ABWR DCD Revision 4, referenced in 10 CFR Part 52, Appendix A. Section 1.2 also incorporates by reference Section 1.2 of the AIA Amendment.

In addition, in FSAR Section 1.2, the applicant provides the following:

<u>Tier 1 Departures</u>

- STD DEP T1 2.3-1 Deletion of MSIV Closure and Scram on High Radiation

This departure removes the Scram and the main steam isolation valve (MSIV) automatic closure upon receipt of a high main steamline radiation monitor (MSLRM) signal.

- STD DEP T1 2.4-3 RCIC Turbine/Pump

This design change replaces the steam turbine-driven reactor core isolation cooling (RCIC) pump with a pump that has an improved design.

- STP DEP T1 2.5-1 Elimination of New Fuel Storage Racks from the New Fuel Vault

This design eliminates the use of the new fuel vault for future fuel storage.

- STD DEP T1 2.14-1 Hydrogen Recombiner Requirements Elimination

This design change removes the hydrogen recombiners.

- STD DEP T1 3.4-1 Safety-Related I&C Architecture

This design change revises the safety-related instrumentation and control (I&C) architecture.

Tier 2 Departure Requiring Prior NRC Approval

- STD DEP 8.3-1 — Plant Medium Voltage Electrical System Design

This departure changes the plant's medium voltage electrical system from a single 6.9 kilovolt (kV) system to a dual voltage system consisting of 13.8 kV and 4.16 kV and affects the TS related to the design change.

Tier 2 Departures Not Requiring Prior NRC Approval

- STP DEP 1.1-2 — Dual Units at STP 3 & 4

This departure recognizes that the ABWR DCD is for a single unit, while the COL application is for two units.

- STD DEP 1.2-1 — Control Building Annex

This design change relocates the reactor internal pump motor generator sets from the control building to a non-seismic control building annex.

- STP DEP 1.2-2 — Turbine Building

This departure changes the design of the turbine building.

- STD DEP 3.8-1 — Resizing the Radwaste Building

This design change resizes and makes other changes to the layout of the Radwaste Building (RW/B).

- STD DEP 9.1-1 — Update of Fuel Storage and Handling Equipment

This departure updates the description of the fuel storage and handling equipment.

- STD DEP 9.4-3 — Service Building HVAC System

This departure changes the design of the service building heating, ventilation, and air conditioning (HVAC) system.

- STD DEP 9.4-4 — Turbine Island HVAC System

This design change revises the turbine island HVAC system.

- STP DEP 10.2-1 — Turbine Design

This departure changes the design of the turbine.

- STP DEP 10.4-2 — Main Condenser

This departure changes the design of the main condenser.

- STD DEP 10.4-6 Load Rejection Capability

This departure changes the load rejection capability of STP Units 3 and 4.

- STD DEP 11.4-1 Radioactive Solid Waste Update

This departure modifies the solid waste management system.

- STD DEP Admin

This administrative departure recognizes that the size of the site is 49.5 square kilometers ($km^2$) (12,220 acres) rather than 49.4 $km^2$ (12,200 acres).

<u>COL License Information Items</u>

- COL License Information Item 1.1a Plant Design and Aging Management

The application contains a supplemental description of the applicant's plan for plant design and aging management.

### 1.2.3 Regulatory Basis

The regulatory basis of the information incorporated by reference is in NUREG–1503. The regulatory basis of the AIA Amendment information incorporated by reference is in NUREG–1948 dated October 2010. In addition, the relevant requirements of the Commission regulations for the general plant description, and the associated acceptance criteria, are in Section 1.0, of NUREG–0800.

In accordance with Section VIII of Appendix A to Part 52, the applicant identified Tier 1, and Tier 2 departures. Tier 1 departures require prior NRC approval and are subject to requirements of 10 CFR Part 52 Appendix A, Section VIII.A.4. Tier 2 departures that affect TS require prior NRC approval and are subject to the requirements of 10 CFR Part 52 Appendix A, Section VIII.C.4. Tier 2 departures not requiring prior NRC approval are subject to the requirements of 10 CFR Part 52 Appendix A Section VIII.B.5, which are similar to the requirements in 10 CFR 50.59.

### 1.2.4 Technical Evaluation

As documented in NUREG–1503 and NUREG–1948, NRC staff reviewed and approved Section 1.2 of the certified ABWR DCD and AIA Amendment. The staff reviewed Section 1.2 of the STP Units 3 and 4 COL FSAR and checked the referenced ABWR DCD and AIA Amendment to ensure that the combination of the information in the COL FSAR and the information in the ABWR DCD and AIA Amendment appropriately represents the complete scope of information relating to this review topic.[2] The staff's review confirmed that the information in the application and the information incorporated by reference address the required information relating to general plant description.

The staff reviewed the following in the COL FSAR:

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[2] See *"Finality of Referenced NRC Approvals"* in SER Section 1.1.3, for a discussion on the staff's review related to verification of the scope of information to be included in a COL application that references a design certification.

Tier 1 Departures

The following Tier 1 departures identified by the applicant in this section require prior NRC approval in the form of an exemption and the full scope of their technical impact may be evaluated in the other sections of this SER. For more information, refer to COL application Part 7, Section 5.0 for a listing of all FSAR sections affected by these Tier 1 departures. Exemption evaluations were tracked as **Open Item 01-1** in the SER with open items. Compliance with 10 CFR Part 52 Appendix A, Section VIII.A.4 for these Tier 1 departures is addressed by the staff in Section 1.11S.1 of this chapter of the SER. Because the exemption evaluations have been completed, Open Item 01-1 is closed.

- STD DEP T1 2.3-1 Deletion of MSIV Closure and Scram on High Radiation

With respect to this section of the FSAR, the applicant has identified that Departure STD DEP T1 2.3-1 results in a necessary editorial revision to ABWR DCD Subsection 1.2.2.2.3.1. Within the review scope of this section, the staff considered this departure editorial in nature. However, ABWR DCD Subsection 1.2.2.2.3.1 does not exist, and it appears that the applicant should be referring to ABWR DCD Subsection 1.2.2.2.2.1 instead. The applicant was asked to address this discrepancy in RAI 01-17. This RAI was tracked as Open Item 01-2 in the SER with open items. The applicant's response to this RAI dated February 1, 2010 (ML100350222), addresses this typographical error and adds that FSAR Section 1.2 will be revised to correct the discrepancy. The staff reviewed Revision 4 of the FSAR and verified that the FSAR was revised as stated in the response to RAI 01-17. Therefore, Open Item 01-2 is closed and RAI 01-2 is resolved and closed. Within the review scope of this section, the staff finds the Tier 1 departure to be acceptable.

- STD DEP T1 2.4-3 RCIC Turbine/Pump

With respect to this section of the FSAR, the applicant has identified that Departure STD DEP T1 2.4-3 results in necessary editorial revisions to ABWR DCD Subsections 1.2.2.5.4 and 1.2.2.5.5. Within the review scope of this section, the staff considered this departure editorial in nature. However, ABWR DCD Subsection 1.2.2.2.5.5 does not exist. The applicant was asked to address this discrepancy in RAI 01-17. This RAI was tracked as Open Item 01-2 in the SER with open items. The applicant's response to this RAI dated February 1, 2010 (ML100350222), addresses this typographical error, and adds that FSAR Section 1.2 will be revised to correct the discrepancy. The staff reviewed Revision 4 of the FSAR and verified that the FSAR was revised as stated in the response to RAI 01-17. Therefore, Open Item 01-2 is closed and RAI 01-17 is resolved and closed. Within the review scope of this section, the staff finds the Tier 1 departure to be acceptable.

- STP DEP T1 2.5-1 Elimination of New Fuel Storage Racks from the New Fuel Vault

With respect to this section of the FSAR, the applicant has identified that Departure STP DEP T1 2.5-1 results in necessary editorial revisions to ABWR DCD Subsections 1.2.2.6.5 and 1.2.2.6.6 to delete the description of fuel handling and storage in the new fuel vault in the reactor building. Within the review scope of this section, the staff considered this departure editorial in nature and finds it acceptable. The technical evaluation allowing the storage of new fuel in the spent fuel pool is documented in Section 9.1.2, “Spent Fuel Storage”, of the SER.

- STD DEP T1 2.14-1 — Hydrogen Recombiner Requirements Elimination

With respect to this section of the FSAR, the applicant has identified that Departure STD DEP T1 2.14-1 results in necessary editorial revisions to ABWR DCD Subsections 1.2.4.3 and 1.2.5.3 and removal of Subsection 1.2.2.15.8. Within the review scope of this section, the staff considered this departure editorial in nature and finds it acceptable.

- STD DEP T1 3.4-1 — Safety-Related I&C Architecture

With respect to this section of the FSAR, the applicant has identified that Departure STD DEP T1 3.4-1 results in necessary editorial revisions to ABWR DCD Subsections 1.2.2.3.11. Within the review scope of this section, the staff considered this departure editorial in nature and finds it acceptable.

<u>Tier 2 Departure Requiring Prior NRC Approval</u>

The following Tier 2 departure identified by the applicant in this section requires prior NRC approval, and the full scope of its technical impact may be evaluated in the other sections of this SER. For more information, refer to COL application Part 7, Section 5.0 for a listing of all FSAR sections affected by this departure.

- STD DEP 8.3-1 — Plant Medium Voltage Electrical System Design

With respect to this section of the FSAR, the applicant has identified that Departure STD DEP 8.3-1 results in necessary editorial revisions to ABWR DCD Subsections 1.2.2.13.2 - 1.2.2.13.5, 1.2.2.13.13, 1.2.2.13.17, and 1.2.2.14.1. Within the review scope of this section, the staff considered this departure editorial in nature and finds it acceptable.

<u>Tier 2 Departures Not Requiring Prior NRC Approval</u>

The following Tier 2 departures not requiring NRC approval identified by the applicant in this section may also be addressed in other sections of this SER. For more information, refer to COL application Part 07, Section 5.0 for a listing of all FSAR sections affected by these departures.

- STP DEP 1.1-2 — Dual Units at STP 3 & 4
- STD DEP 1.2-1 — Control Building Annex
- STP DEP 1.2-2 — Turbine Building
- STD DEP 3.8-1 — Resizing the RW/B
- STD DEP 9.1-1 — Update of Fuel Storage and Handling Equipment
- STD DEP 9.4-3 — Service Building HVAC System

- STD DEP 9.4-4 Turbine Island HVAC System
- STP DEP 10.2-1 Turbine Design
- STP DEP 10.4-2 Main Condenser
- STD DEP 10.4-6 Load Rejection Capability
- STD DEP 11.4-1 Radioactive Solid Waste Update

The applicant's evaluation determined that these departures do not require prior NRC approval in accordance with 10 CFR Part 52 Appendix A, Section VIII.B.5. Within the review scope of this section, the staff found it reasonable that these departures do not require prior NRC approval. The applicant's process for evaluating departures and other changes to the DCD is subject to NRC inspections.

- STD DEP Admin

The applicant defines administrative departures as minor corrections, such as editorial or administrative errors in the referenced ABWR DCD (e.g., misspellings, incorrect references, table headings, etc.). The applicant identifies that this administrative departure recognizes that the size of the site is 49.5 $km^2$ (12,220 acres) rather than 49.4 $km^2$ (12,200 acres). NRC staff determined that this administrative departure does not affect the presentation of any design discussion or qualification of design margin. Therefore, this departure is acceptable.

The applicant’s evaluation in accordance with 10 CFR Part 52 Appendix A Section VIII.B.5, determined that this departure does not require prior NRC approval. Within the review scope of this section, the staff found it reasonable that this departure does not require prior NRC approval. In addition, the applicant’s process for evaluating departures and other changes to the DCD is subject to NRC inspections.

<u>COL License Information Items</u>

- COL License Information Item 1.1a Plant Design and Aging Management

This COL License Information Item directs the applicant to initiate life-cycle management early in the design process and to consider the design life requirements as outlined in Subsection 1.2.1.3 of the DCD. It also specifies that the aging management program shall cover the structures and components, and consider the potential corrosion causes, outlined in Subsection 1.2.1.3 of the DCD. This was tracked as Open Item 01-3 in the SER with open items.

The applicant describes the Design and Aging Management Program and breaks it down into the areas of Design Life, Design Life Maintenance, and Aging Management. The Design and Aging Management Program is broad and considers a variety of issues such as design margins, water quality, material selection, and environmental conditions. Detailed technical reviews of such programs are normally conducted as part of a license renewal process. The applicant is committed to following the programs described in NUREG–1801, “Generic Aging Lessons Learned (GALL) Report,” to support license renewal. The GALL Report summarizes the staff’s approved aging management programs (AMPs) to manage or monitor the aging of structures and components that are subject to an AMP. The GALL Report also serves as a quick reference for applicants and staff reviewers to AMPs and activities that the staff determined will adequately manage or monitor the plant during the period of operation. The time-limited aging analysis programs or acceptable alternatives will be monitored and trended by the applicant to ensure that the component or structure does not exceed the design limits.

The staff finds that the applicant's response to COL License Information Item 1.1a is acceptable and Open Item 01-3 is closed. If the applicant chooses to apply for license renewal, the requirements of 10 CFR Part 54 will apply.

### 1.2.5 Post Combined License Activities

There are no post COL activities related to this section.

### 1.2.6 Conclusion

The NRC staff's finding related to information incorporated by reference is in NUREG–1503 and NUREG–1948. NRC staff reviewed the application and checked the referenced DCD and AIA Amendment. The staff's review confirmed that the applicant has addressed the required information, and no outstanding information is expected to be addressed in the COL FSAR related to this section. Pursuant to 10 CFR 52.63(a)(5) and 10 CFR Part 52 Appendix A Section VI.B.1, all nuclear safety issues relating to the general plant description that were incorporated by reference have been resolved.

In addition, the staff concluded that the relevant information in the COL application is acceptable, satisfies NRC regulations, and meets the requirements defined in the ABWR DCD, and 10 CFR Part 52, Appendix A. The staff's conclusion is based on the following:

- The staff reviewed the proposed Tier 1 departures with respect to Commission rules and regulations. For the purpose of the staff's Section 1.2 review, the staff determined that these departures are consistent with Commission rules and regulations and has no adverse impact on public health and safety.

- For the purposes of the staff's Section 1.2 review, the staff found that the "Tier 2 Departure Requiring Prior NRC Approval" identified by the applicant has no adverse impact on public health and safety and is consistent with NRC rules and regulations.

- For the purposes of the staff's Section 1.2 review, the staff found that, for all of the "Tier 2 Departures Not Requiring Prior NRC Approval" identified by the applicant, it is reasonable that they do not require prior NRC approval per 10 CFR Part 52, Appendix A, Section VIII.B.5.

- Within the review scope of this section, the staff's review confirmed that the applicant has adequately addressed COL License Information Item 1.1a in accordance with Section 1.0 of NUREG–0800.

## 1.3 Comparison Tables (Related to RG 1.206, Section C.I.1.3, "Comparison with Other Facilities")

This section of the FSAR highlights the principal design features of the plant and compares its major features with those of other boiling-water reactor (BWR) facilities.

Section 1.3 of the STP COL FSAR Revision 12 incorporates by reference Section 1.3, "Comparison Tables," of the certified ABWR DCD Revision 4, referenced in 10 CFR Part 52, Appendix A, with no departures or supplements. NRC staff reviewed the application and checked the referenced DCD to ensure that no issue relating to this section remains for review.[3] The staff's review confirmed that there is no outstanding information outside of the DCD related to this section. Pursuant to 10 CFR 52.63(a)(5) and 10 CFR Part 52 Appendix A Section VI.B.1, all nuclear safety issues relating to the "Comparison Tables" have been resolved.

## 1.4 Identification of Agents and Contractors

### 1.4.1 Introduction

This FSAR Revision 12 section identifies the primary agents and contractors for STP Units 3 and 4.

### 1.4.2 Summary of Application

Section 1.4 of the STP Units 3 and 4 COL FSAR Revision 12 incorporates by reference Section 1.4 of the certified ABWR DCD Revision 4, with no departures. Section 1.4 also incorporates by reference Section 1.4 of the AIA Amendment.

In addition, in FSAR Section 1.4, the applicant provides the following:

Supplemental Information

In Section 1.4.4, "Identification of Agents and Contractors – STP 3 & 4," Part 2, Revision 5 of the STP Units 3 and 4 COL application, the applicant identifies NINA as the licensee responsible for the design and construction of STP Units 3 and 4. The applicant identifies STPNOC as the licensee responsible for the operation and maintenance of STP Units 3 and 4. This information remains in Revision 12 of the FSAR.

In Subsection 1.4.4.3, "Toshiba Power Systems Company," Part 2, Revision 12 of the STP Units 3 and 4 COL application, the applicant identifies Toshiba Power Systems Company (Toshiba) as responsible for the engineering, procurement, and construction (EPC) of STP Units 3 and 4. Toshiba also has overall responsibility for the design and construction of the facility and support of the COL application.

The applicant identifies Westinghouse Electric Corporation (Westinghouse or WEC) as a subcontractor with significant experience in the design, construction, inspection, and maintenance of nuclear power plants.

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[3] See *"Finality of Referenced NRC Approvals"* in SER Section 1.1.3, for a discussion on the staff's review related to verification of the scope of information to be included in a COL application that references a design certification.

The applicant identifies Sargent & Lundy as a subcontractor providing engineering services, specifically for the design of the nuclear island but also for the reactor building, control building, radwaste buildings, and ultimate heat sink.

The applicant identifies the following specialized consultants:

- Tetra Tech NUS, Inc., prepared sections of the FSAR and the Environmental Report (ER) including socioeconomics, demographics, ecology, impacts of construction and operation, impacts of radioactive waste generation and transportation, and environmental impacts of postulated accidents.
- MACTEC Engineering and Consulting, Inc., performed geotechnical field and laboratory tests.
- William Lettis & Associates, Inc. performed geologic mapping and characterization of seismic sources.
- Risk Engineering, Inc., performed probabilistic seismic hazard assessments.
- Bechtel Corporation provided support with regard to the ER and site characterization.

### 1.4.3 Regulatory Basis

The regulatory basis for the information incorporated by reference is in NUREG–1503. The regulatory basis of the AIA Amendment information incorporated by reference is in NUREG–1948. In addition, the relevant requirements of the Commission regulations for the identification of agents and contractors, and the associated acceptance criteria, are in RG 1.206, Regulatory Position C.I.1.4.

### 1.4.4 Technical Evaluation

As documented in NUREG–1503 and NUREG–1948, NRC staff reviewed and approved Section 1.4 of the certified ABWR DCD and AIA Amendment. The staff reviewed Section 1.4 of the STP Units 3 and 4 COL FSAR and checked the referenced ABWR DCD and AIA Amendment to ensure that the combination of the information in the COL FSAR and the information in the ABWR DCD and AIA Amendment appropriately represents the complete scope of information relating to this review topic.[4] The staff's review confirmed that the information in the application and the information incorporated by reference address the required information relating to identification of agents and contractors.

The staff reviewed the following information in the COL FSAR:

[4] See *"Finality of Referenced NRC Approvals"* in SER Section 1.1.3, for a discussion on the staff's review related to verification of the scope of information to be included in a COL application that references a design certification.

Supplemental Information

In accordance with RG 1.206, Regulatory Position C.I.1.4, “Identification of Agents and Contractors,” the applicant has provided supplemental information that identifies the primary agents for the design, construction, and operation of the proposed facility. The applicant delineates the division of responsibility among the contractors. For each subcontractor and specialized consultant contractor, the applicant provides a history of nuclear-related work experience. Each contractor, subcontractor, and specialized consultant is known and is acceptable to the staff for providing expertise in the technical area or in areas specified in the application. The staff found that the applicant has adequately addressed this supplemental information in accordance with RG 1.206, Regulatory Position C.1.I.4.

### 1.4.5 Post Combined License Activities

There are no post COL activities related to this section.

### 1.4.6 Conclusion

The NRC staff’s finding related to information incorporated by reference is in NUREG–1503 and NUREG–1948. NRC staff reviewed the application and checked the referenced DCD and AIA Amendment. The staff’s review confirmed that the applicant has addressed the required information, and no outstanding information is expected to be addressed in the COL FSAR related to this section. Pursuant to 10 CFR 52.63(a)(5) and 10 CFR Part 52 Appendix A Section VI.B.1, all nuclear safety issues relating to identification of agents and contractors that were incorporated by reference have been resolved.

In addition, the staff concluded that the relevant information in the COL application is acceptable and satisfies NRC regulations. The staff’s conclusion is based on the following:

- The NRC staff’s review confirmed that the applicant has adequately addressed the supplemental information in accordance with RG 1.206, Regulatory Position C.I.1.4.

## 1.4S Qualifications of Alternate Vendor

This section does not exist in either the ABWR DCD or COL FSAR. The staff has added this section to the SER in order to address issues regarding the applicant’s alternate vendor qualifications.

### 1.4S.1 Introduction

NINA is the applicant for the COL. The EPC contract was awarded to a consortium led by Toshiba. As the Holder of the EPC contract, Toshiba will assume the duties normally assigned to the plant vendor and the entity that originally obtained the design certification. Because Toshiba is not the entity that originally obtained the design certification, it is referred to as an “alternate vendor.”

Worldwide, Toshiba has been in the nuclear field since the late 1950s. Toshiba’s experience as a subcontractor for nuclear power plant construction dates back to the

1960s and experience as a prime contractor in nuclear power plant construction dates back to the early 1970s. Toshiba supplied the nuclear steam supply system for both the Kashiwazaki-Kariwa Nuclear Power Station Unit No. 6 and Hamaoka Nuclear Power Station Unit No. 5 and supplied the balance of the plant (without the turbine and generator) for Kashiwazaki-Kariwa Nuclear Power Station Unit No. 7. Although these three plants are also ABWRs, their designs are not identical to the U.S. certified ABWR design. However, Toshiba was also an associate of GE in the development of the U.S. ABWR design.

The U.S. ABWR design certification FSER (NUREG–1503) describes the relationship between GE and its associates (including Toshiba) in support of the U.S. certified ABWR design. Recognizing Toshiba's contributions to the ABWR certified design, NRC staff proposed two activities for conducting the alternate vendor qualification review:

(1) a review of the STPNOC due diligence summary report

(2) audits or inspections, as necessary, conducted during Phase 1 of the COL application review to support the review of the STPNOC due diligence summary report

This section of the SER documents the review and findings of the associated audits and inspections. In preparing the safety evaluation, the staff addressed these fundamental questions:

- Since Toshiba is not the entity that obtained the design certification, what information needed to support the COL process may not be available to the applicant (e.g., proprietary topical reports or computer codes)? How does the applicant intend to fill the design-basis gaps caused by the unavailability of this information?

- Has the applicant adequately assessed the ability of Toshiba (and other contractors) to provide the information that must be reconstituted?

- Do we have a reasonable assurance that the process employed by the applicant was adequate to identify all design-basis information that must be reconstituted?

- Do we have a reasonable assurance that Toshiba and its contractors will be able to assume the duties normally assigned to the plant vendor and to the entity that originally obtained the design certification? Do they have the expertise and technical competence to adequately manage and control design changes and support the licensing process?

- What are the differences between the ABWR designs that Toshiba has already developed and the U.S. certified ABWR design? Is there a reasonable assurance that Toshiba can address these differences and provide a U.S. certified ABWR design?

### 1.4S.2 Summary of Due Diligence Outline

In a letter dated August 19, 2008, STPNOC submitted on the STP Unit 3 and 4 Dockets (ML082350161 [proprietary] and ML082350160 [non-proprietary]) outlines of the due diligence assessment of Toshiba's qualifications to provide the ABWR design for STP

Units 3 and 4. The due diligence effort was intended to assess areas where, in the applicant's opinion, Toshiba may not have the direct experience necessary to support the U.S. certified ABWR design. The applicant evaluated, in detail, the areas of design documentation, ongoing technical development, licensing support, and the development and implementation of a supply chain.

In conducting the due diligence evaluation, the applicant divided the scope of work into the following nine basic tasks:

(1) Design Documentation – This task identifies the references in licensing documents that must be reestablished or reconstituted in order to support the licensing process.

(2) Unique Issues – This task identifies unique issues and develops an understanding of how these issues affect the plant's design.

(3) Design-Basis Information – This task identifies the design-basis information required from Toshiba, including the ability to estimate the level of effort needed to provide that information.

(4) Americanization – This task determines the impact of issues such as the conversion to U.S. units of measure (e.g., metric to English units); the use of U.S. Codes and Standards; and the shift from foreign to U.S. suppliers.

(5) Engineering Schedule/Resources – This task updates the schedule and resource requirements identified in the results of the other tasks.

(6) USNRC Interface – This task determines how to implement 10 CFR Part 52 with an alternate vendor and how to develop COL application revisions without the participation of the ABWR design certification applicant.

(7) Specific Engineering Disciplines – This task develops action plans for addressing issues of seismic and structural design, safety-related I&C, the oscillation power range monitor (OPRM) system, human factors engineering, fuel analyses, probabilistic risk assessments, severe accident mitigation, and hydrodynamic loads.

(8) Supply Chain – This task demonstrates that the engineering, procurement, and construction teams are able to deliver the required materials and equipment.

(9) Mitigation Management Assessment – This task presents and summarizes mitigation management methods for uncertainties.

In a letter dated December 18, 2008, STPNOC submitted proprietary (ML083660245) and non-proprietary (ML083660244) revisions to the outline of the due diligence effort. These revisions update STPNOC's decision on the disposition of various documents associated with the ABWR design.

## 1.4S.3 Regulatory Basis

The application for certification of the U.S. ABWR design was filed by GE Nuclear Energy. As the Holder of the EPC contract, Toshiba will provide the design for STP Units 3 and 4. The regulations in 10 CFR 52.73(a) allow an alternate vendor to supply a certified design; however, the regulations require the alternate vendor to be demonstrated as qualified to supply that design.

## 1.4S.4 Technical Evaluation

### 1.4S.4.1 Design-Basis Documentation

In order to supply a design for the U.S. certified ABWR, Toshiba will have to translate the design descriptions in the DCD into a workable design and support that design throughout the licensing process. Some information in the DCD or in its references may not be publically available, either because it is proprietary to the design certification applicant or for other reasons. The unavailability of information could result in gaps in the design-basis documentation, which could make it necessary for the applicant to reconstitute certain information.

The applicant has performed a thorough review of the DCD, the NRC staff's FSER for the DCD (NUREG–1503), and the applicant's COL application. The applicant has identified the references cited in these documents and grouped those references into three categories: direct references (i.e., documents cited directly); embedded references (i.e., documents cited in a direct reference); and indirect references (i.e., technical statements that are not associated with a direct reference).

The result of the applicant's review is a proprietary Direct Reference Master List with 162 references that the applicant provided in the December 18, 2008, revised due diligence submittal. The applicant grouped these references into eight major categories (the second category has three subcategories). Each category is associated with a proposed method of disposition. The categories and proposed dispositions for the references are as follows:

Category 1 Reference was replaced with a report that changed the licensing basis.

Category 2A New reports were needed to support the STP COL application.

Category 2B New reports were written for closing the ITAAC.

Category 2C New reports were needed at the time of COL issuance.

Category 3 Reference was replaced as part of the license fuel amendment.

Category 4 No replacement was necessary (e.g., the applicant is authorized to use the reference).

Category 5 Reference was replaced by a new report (NRC staff approval is not necessary).

Category 6 Superseded documents are not required for STP Units 3 and 4.

Category 7 Document is no longer valid; the information is in the COL application.

Category 8 Documents are not applicable to STP Units 3 and 4.

The staff reviewed the applicant's reference list and the proposed methods of disposition for both completeness and acceptability, taking into account the experience and abilities of the applicant; Toshiba; and the other contractors and subcontractors identified in this section of the SER. The staff determined that the following areas warranted additional inspection, audit, or other information before a conclusion on vendor qualifications could be reached.

Pressure-Temperature Limits

Approved pressure-temperature (P/T) limits or an approved pressure-temperature limits report (PTLR) is required to support the issuance of a COL. The P/T limits in the ABWR DCD are representative curves only; they are not approved plant-specific curves that are appropriate for incorporation by reference. GE's methodology for developing P/T limits is in proprietary documents.

In response to a request for this documentation, the applicant submitted a PTLR in July 2009 (ML092080079) for NRC staff to review. This PTLR review included the methodology for developing acceptable P/T limits. The staff's review is in Chapter 5 of this SER. The staff concluded that the proposed STP Units 3 and 4 PTLR meets the Generic Letter 96-03 guidance for implementation and, therefore, is approved as part of the STP Units 3 and 4 licensing.

Neutron Fluence Projection

The impact of radiation embrittlement of the reactor vessel must be evaluated to support COL issuance. GE's staff-approved methodology for determining radiation embrittlement is in a proprietary document.

In addition to the PTLR, the applicant submitted a methodology for determining the impact of radiation embrittlement on the reactor vessel. The NRC staff's review of this methodology is in Chapter 5 of this SER. The staff found the applicant's methodology acceptable.

Containment Analytical Model

The ABWR containment combines design features of Mark II and Mark III containments. The vent system is a combination of vertical (Mark II design) and horizontal (Mark III design) drywell-to-wetwell vent systems, and the wetwell (suppression pool and air space) is similar to a Mark II. The referenced NEDO–20533 report "The General Electric Mark III Pressure Suppression Containment System Analytical Model," dated June 1974, and its supplement were originally written for predicting Mark III transients. Adapting these models to simulate the ABWR design is possible but was not straightforward, as discussed in the NRC staff's evaluation of ABWR DCD Subsection 6.2.1.2, NUREG–1503, dated July 1994. It was only after receiving a letter dated May 22, 1992, which provided additional justification and documented a May 6, 1992, meeting where GE clarified assumptions, that the NRC staff concluded that the use of NEDO-20533 for the ABWR is acceptable.

The applicant states in Section 4.1 of Revision 0 of the Due Diligence Report that Toshiba has access and shares ownership rights to the ABWR common engineering documents, and Toshiba has either already acquired the required design documentation for STP Units 3 and 4 or has the capability to develop or reconstitute the necessary documentation, which the staff confirmed during an inspection of Toshiba's facilities in Japan in July 2009.

Based on this review of the information in the application, the staff determined that inspection efforts were necessary in the area of containment analysis. The staff needed to confirm that the models and analytical assumptions described in NEDO–20533 and its supplements have been correctly implemented into the GOTHIC code, so that the calculated containment peak pressures are bounded by the approved DCD containment analysis. In addition, the staff needed to confirm that the GOTHIC analysis is bounded by the GE analysis and has been benchmarked against applicable empirical test data. The results of the staff's efforts in this area are detailed in Chapter 6, "Engineering Safety Features," of this SER. The staff concluded that the applicant's analyses were conservative.

<u>Containment Hydrodynamic Loads</u>

The evaluation of containment hydrodynamic loads is closely related to the implementation of NEDO–20533 models and assumptions in the STP GOTHIC analysis (WCAP-17058-P, "Implementation of GE NEDO-20533 Methodology with GOTHIC for ABWR Containment Design Analysis," dated June 2009 [ML092740183 as public and ML091870333 as non-public]), as discussed below in Subsection 1.4S.4.2, "Specific Inspection Findings."

The NRC staff's evaluation of the original ABWR design certification application is included in Subsection 6.2.1.6 of NUREG-1503. The staff noted that direct application of the Mark II methodology (PISCM Code) to the ABWR design is inappropriate due to the differences in vent configurations. GE had to develop a special correlation to account for the uneven pool slug rise observed in the Mark III Pressure Suppression Test Facility (PSTF) tests. In addition, the staff noted that the Mark II pool swell model (PSAM Code) is unacceptable, and the ultimate acceptance is based on comparisons with the database. The staff further stated that "as a result, the use of the program for configurations other than those encompassed by the test data would not be accepted without further comparisons with applicable test data."

The applicant acknowledges in the due diligence report that (1) there is a lack of explicit benchmark data for the horizontal vent design, (2) further benchmarking is planned, and (3) Toshiba has access to and permission to use the data collected from a Mark III test. A separate technical report was submitted for the NRC to review and approve in parallel with the COL application review. The results of the staff's efforts in this area are in Section 6.2 of this SER. The staff found the applicant's analysis to be acceptable.

Based on the review of the information in the application, the staff determined that inspection efforts were necessary in the area of vent clearing and pool swell analytical models, including the available database and computer benchmarking, if any. The results of the staff's inspection efforts are in Subsection 1.4S.4.2 of this SER.

Instrumentation and Control

NRC staff reviewed the outline of the applicant's due diligence efforts and determined that a high-level inspection is appropriate of the EPC team's qualifications to design and implement I&C systems for STP Units 3 and 4. The staff specifically wanted to evaluate the EPC team's technical capabilities and qualifications to specify, manufacture, test, and implement a field programmable gate array (FPGA) based nuclear monitoring system that includes an OPRM, a startup range nuclear monitoring system, a power range nuclear monitoring system, and other non-safety-related components. The staff focused on the development of the OPRM, which is a first-of-a-kind product for Toshiba, and on the use of FPGA technology, which is a first-of-a-kind technology for safety-related applications in the U.S. nuclear industry.

The staff also determined the need to inspect the EPC team's abilities to specify, manufacture, test, and implement an FPGA-based reactor trip isolation system, which is a first-of-a-kind product for both Toshiba and the U.S. nuclear industry. The staff also determined the need to inspect the EPC team's abilities to design and integrate several different digital I&C platforms for both safety-related and non-safety-related systems. The staff conducted these inspections at Toshiba's Yokohama and Fuchu facilities in Japan in July 2009. The results of the staff's inspections are in Subsection 1.4S.4.2 of this SER.

Quality Assurance

To justify the independent assessment of Toshiba's qualifications as an alternate vendor, the staff verified that Toshiba had implemented a quality assurance (QA) Program that complies with the requirements of 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," Appendix B, "Quality Assurance Program Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," (Appendix B) and a program for reporting defects and non-conformances consistent with the requirements of 10 CFR Part 21, "Reporting of Defects and Noncompliance," in a manner that provides reasonable assurance that Toshiba is capable of supplying the design of the ABWRs for STP Units 3 and 4. Specific areas of the staff's inspection included the following:

- *Alternate Vendor Qualification* – NRC inspectors reviewed ABWR engineering documents, licensing technical reports referenced in the ABWR DCD, and applicable test data to independently confirm that Toshiba has access to the ABWR engineering documents that form the design-basis documents for the certified U.S. ABWR design.

- *10 CFR Part 21 Program* – NRC inspectors reviewed Toshiba's policies and implementation procedures that govern the 10 CFR Part 21 Program to verify compliance with the requirements of 10 CFR Part 21.

- *Quality Assurance Program* – NRC inspectors reviewed Toshiba's QA policies and implementing procedures that govern the QA Program to verify compliance with the requirements of Criterion II, "Quality Assurance Program," of Appendix B.

- *Design Control* – NRC inspectors reviewed Toshiba's QA policies and implementation procedures that govern the design control process to verify compliance with the requirements of Criterion III, “Design Control,” of Appendix B.

- *Procurement Document Control* – NRC inspectors reviewed Toshiba’s QA policies and implementation procedures that govern the procurement document control process to verify compliance with the requirements of Criterion IV, “Procurement Document Control,” of Appendix B.

- *Document Control* – NRC inspectors reviewed Toshiba’s QA policies and implementation procedures that govern the document control process to verify compliance with the requirements of Criterion VI, “Document Control,” of Appendix B.

- *Control of Purchased Materials, Equipment, and Services* – NRC inspectors reviewed Toshiba’s QA policies and implementation procedures that govern the control of purchased materials, equipment, and services to verify compliance with the requirements of Criterion VII, “Control of Purchased Material, Equipment, and Services,” of Appendix B.

- *Non-Conforming Materials, Parts, or Components* – NRC inspectors reviewed Toshiba’s QA policies and implementation procedures that govern the nonconforming materials, parts, or components to verify compliance with the requirements of Criterion XV, “Nonconforming Materials, Parts or Components,” of Appendix B.

- *Corrective Action* – NRC inspectors reviewed Toshiba’s QA policies and implementation procedures that govern the corrective action process to verify compliance with the requirements of Criterion XVI, “Corrective Action,” of Appendix B.

- *Training and Qualifications* – NRC inspectors reviewed Toshiba’s QA policies and implementation procedures that govern the control of training and qualifying personnel performing activities affecting quality to verify compliance with the requirements of Criterion II, “Quality Assurance Program,” of Appendix B.

- *Initial Test Program (ITP)* – NRC inspectors reviewed Toshiba’s QA policies and implementation procedures that govern the process used to develop and implement the STP Units 3 and 4 Initial Plant Test Program.

The staff conducted these reviews during inspections of Toshiba’s Yokohama and Fuchu engineering facilities in Japan in July 2009. During the inspections, staff had access to translated documentation. The staff’s conclusions as a result of these inspections are in Subsection 1.4S.4.2 of this SER.

### 1.4S.4.2 Specific Inspection Findings

Containment Analytical Model

The P/T calculation was performed by Westinghouse using the GOTHIC computer code. Toshiba did not provide any specific test data as a basis for the GOTHIC qualification. However, the selected Horizontal Vent Tests (HVTs) were used for code verification.

The NRC inspector confirmed that Toshiba has access to the HVT test data to be used to verify the GOTHIC code for the P/T calculation.

<u>Containment Hydrodynamic Loads</u>

A pool swell analysis was performed by Toshiba using the GOTHIC code. The code was benchmarked against the GE PSTF test data (5800 series). Toshiba provided the test data in the form of a "derivative document" based on the GE data. Toshiba presented a first revision of this document during the July 2009 inspection. The NRC inspector confirmed that Toshiba has access to the GE PSTF test data and that the process being used to develop the Toshiba derivative document is acceptable.

Hydrodynamic loads were defined by Toshiba and provided to the STP for use in a licensing structural analysis. The definition of the pressure-forcing functions for the condensation oscillation (CO) and chugging (CH) loads will be based on the HVT test data (full-scale and subscale), as defined in the internal derivative document. The Toshiba derivative document for CO and CH loads was not yet complete at the time of the inspection and verification of the document was tracked as Open Item 01-4 in the SER with open items. On March 16, 2010 and June 17, 2010, the staff performed an audit of the STP and Toshiba documentation for hydrodynamic loads to support the staff's evaluation of Toshiba as an EPC alternate vendor for the STP. Based on this audit and review, the staff concluded that STPNOC has demonstrated that Toshiba is qualified to provide the certified design information associated with hydrodynamic loads (ML101820358). Therefore, Open Item 01-4 is closed. The hydrodynamic loads are addressed in Section 3.8, "Seismic Category I Structures," and in Section 6.2, "Containment System," of this SER.

For the safety/relief valve (SRV) loads, Toshiba will use the GE empirical correlation developed for the X-quenchers that are to be used in the STP ABWR. This correlation was previously approved by the NRC for BWR licensing applications. The NRC inspector confirmed that Toshiba has access to the GE data developed for the X-quenchers.

<u>Instrumentation and Control</u>

Based on GE's publically available algorithms and logic for the OPRM system, Toshiba has already developed an OPRM prototype using the FPGA technology. Toshiba is essentially following the software QA process suitable for developing safety–related, central processing unit-based digital I&C systems, in accordance with the EPRI Topical Report–107330, "Generic Requirements Specification for Qualifying a Commercial PLC for Safety-Related Applications in Nuclear Power Plants."

NRC inspectors concluded that Toshiba has the experience and capability to supply the OPRM system for STP Units 3 and 4. Toshiba also demonstrated through its past experience in Japan and its ongoing efforts with STP Units 3 and 4 that it has the ability to integrate the various I&C safety and non-safety platforms for the entire plant. A more detailed presentation of the staff's findings is in the NRC Inspection Report (IR 05200012/2009-202 and 05200013/2009-202 dated August 28, 2009 [ML092370709]).

Quality Assurance

*Alternate Vendor Qualifications* – Based on the areas reviewed during the inspection, NRC inspectors independently confirmed STPNOC's due diligence review of Toshiba. The inspectors concluded that STPNOC's due diligence review adequately demonstrates that Toshiba is qualified to supply the ABWR certified design, as required by 10 CFR 52.73(a). The staff also found a reasonable assurance that Toshiba has the capabilities and technical competence necessary to assume the duties normally assigned to the design vendor. A more detailed presentation of the staff's findings is in the NRC Inspection Report (IR 05200012/2009-202 and 05200013/2009-202 dated August 28, 2009 [ML092370709]).

*10 CFR Part 21 Program* – NRC inspectors concluded that Toshiba's program requirements for 10 CFR Part 21 are consistent with the regulatory requirements of 10 CFR Part 21 and are being effectively implemented. A more detailed presentation of the staff's findings is in the NRC Inspection Report (IR 05200012/2009-202 and 05200013/2009-202 dated August 28, 2009 [ML092370709]).

*Appendix B Program* – NRC inspectors concluded that Toshiba's requirements for the QA Program are consistent with the regulatory requirements of Criterion II of Appendix B. Based on the limited sample of documents reviewed, the inspectors also determined that Toshiba's Quality Assurance Manual (QAM) and associated procedures related to the QA Program are being effectively implemented. A more detailed presentation of the staff's findings is in the NRC Inspection Report (IR 05200012/2009-202 and 05200013/2009-202 dated August 28, 2009 [ML092370709]).

*Design Control* – NRC inspectors concluded that Toshiba's program requirements for design control are consistent with the regulatory requirements of Criterion III of Appendix B. Based on the limited sample of design documentation reviewed, the inspectors also determined that Toshiba's QAM and associated design control procedures are being effectively implemented. A more detailed presentation of the staff's findings is in the NRC Inspection Report (IR 05200012/2009-202 and 05200013/2009-202 dated August 28, 2009 [ML092370709]).

*Procurement Document Control* – NRC inspectors concluded that Toshiba's program requirements for procurement document control are consistent with the regulatory requirements of Criterion IV of Appendix B. Based on the limited sample of documents reviewed, the NRC inspectors also determined that Toshiba's QAM and associated procedures for procurement document control are being effectively implemented. A more detailed presentation of the staff's findings is in the NRC Inspection Report (IR 05200012/2009-202 and 05200013/2009-202 dated August 28, 2009 [ML092370709]).

*Document Control* – NRC inspectors concluded that Toshiba's program requirements for document control are consistent with the regulatory requirements of Criterion VI of Appendix B. Based on the limited sample of documents reviewed, the inspectors also determined that Toshiba's QAM and associated document control procedures are being effectively implemented. A more detailed presentation of the staff's findings is in the NRC Inspection Report (IR 05200012/2009-202 and 05200013/2009-202 dated August 28, 2009 [ML092370709]).

*Control of Purchased Materials, Equipment, and Services* – The NRC inspectors made a finding relative to the use of an external audit checklist in performing internal audits;

Toshiba took the action to allow for the use of more appropriate checklists. The inspectors concluded that Toshiba's program requirements for the control of purchased materials, services, and equipment are consistent with the regulatory requirements of Criterion VII of Appendix B. Based on the limited sample of documents reviewed, the inspectors also determined that Toshiba's QAM and associated procedures for the control of purchased materials, equipment, and services are being effectively implemented. A more detailed presentation of the staff's findings is in the NRC Inspection Report (IR 05200012/2009-202 and 05200013/2009-202 dated August 28, 2009 [ML092370709]).

*Nonconforming Materials, Parts, or Components* – NRC inspectors concluded that Toshiba's program requirements for the control of nonconforming materials, parts, or components are consistent with the regulatory requirements of Criterion XV of Appendix B. Based on the limited sample of documents reviewed, the inspectors also determined that Toshiba's QAM and associated procedures for the control of nonconforming materials, parts, or components are being effectively implemented. A more detailed presentation of the staff's findings is in the NRC Inspection Report (IR 05200012/2009-202 and 05200013/2009-202 dated August 28, 2009 [ML092370709]).

*Corrective Action* – The NRC inspectors made a finding relative to the timeliness of some corrective actions; Toshiba revised its procedures to improve in this area. The inspectors concluded that Toshiba's program requirements for corrective actions are consistent with the regulatory requirements of Criterion XVI of Appendix B. Based on the limited sample of documents reviewed, the inspectors also determined that Toshiba's QAM and associated corrective action procedures are being effectively implemented. A more detailed presentation of the staff's findings is in the NRC Inspection Report (IR 05200012/2009-202 and 05200013/2009-202 dated August 28, 2009 [ML092370709]).

*Training and Qualification* – The NRC inspectors found that there was no implementing procedure for the new training database; nevertheless, Toshiba QA staff were knowledgeable on how the database works. Toshiba initiated a corrective action to address the lack of procedural guidance. The inspectors found that Toshiba's program requirements for training and qualifying personnel performing activities affecting quality are consistent with the regulatory requirements of Criterion II of Appendix B. Based on the limited sample of training and qualification records reviewed, the inspectors also determined that Toshiba's QAM and associated training and qualification procedures are being effectively implemented. A more detailed presentation of the staff's findings is available in the NRC Inspection Report (IR 05200012/2009-202 and 05200013/2009-202 dated August 28, 2009 [ML092370709]).

*Initial Test Program* – NRC inspectors concluded that STPNOC and Toshiba have adequate design and change controls for documenting STP Units 3 and 4 ITP changes and/or Tier 2 departures. The inspectors also concluded that STPNOC and Toshiba have provided adequate procedures to document overlapping activities between the ITP and the ITAAC. A more detailed presentation of the staff's findings is in the NRC Inspection Report (IR 05200012/2009-202 and 05200013/2009-202 dated August 28, 2009 [ML092370709]).

### 1.4S.5 Post Combined License Activities

There are no post COL activities related to this section.

### 1.4S.6 Conclusion

NRC staff reviewed the information in the application and performed audits to determine the qualification of Toshiba as an alternate vendor. The staff's review concluded that Toshiba is qualified to supply the design in accordance with 10 CFR 52.73(a).

## 1.5 Requirements for Further Technical Information

This section of the FSAR identifies requirements for further technical information related to those portions of the facility that are not certified, including an estimated schedule for providing the additional technical information that was not included with the initial COL application submittal and which may be necessary for issuance of a COL.

Section 1.5 of the STP Units 3 and 4 COL FSAR Revision 12 incorporates by reference Section 1.5, "Requirements for Further Technical Information," of the certified ABWR DCD Revision 4 with no departures or supplements. NRC staff reviewed the application and checked the referenced DCD to ensure that no issue relating to this section remains for review.[5] The staff's review confirmed that there is no outstanding issue related to this subsection. Pursuant to 10 CFR 52.63(a)(5) and 10 CFR Part 52 Appendix A Section VI.B.1, all nuclear safety issues relating to the "Requirements for Further Technical Information" have been resolved.

## 1.5S Other Regulatory Considerations

This section does not exist in either the ABWR DCD or COL FSAR. NRC staff has added this section to the SER in order to address issues regarding other regulatory considerations for the applicant.

### 1.5S.1 Applicant Technical Qualifications

Since the submission of Revision 5 of the FSAR, as described in Section 1.4.4, NINA assumed the responsibility for licensing, design, and construction of STP Units 3 and 4, and STPNOC will be the operator of these two ABWR units. Since November 17, 1997, STPNOC has operated the STP Units 1 and 2 nuclear power plants. Based on STPNOC's experience and demonstrated performance related to the operation of these existing nuclear units, the staff concluded that STPNOC is technically qualified to engage in the activities associated with the operation of STP Units 3 and 4 in accordance with the provisions of 10 CFR 52.97(a)(1)(iv). In assuming responsibility for the design and construction of STP Units 3 and 4, NINA organized itself by transitioning the previously existing STPNOC organization responsible for the development of STP Units 3 and 4 from STPNOC to NINA. Since then, NINA has demonstrated the ability to choose and manage the oversight of nuclear steam supply system vendors, architect-engineers, and constructors of nuclear-related work. Thus, the NRC staff concludes that

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[5] See *"Finality of Referenced NRC Approvals"* in SER Section 1.1.3, for a discussion on the staff's review related to verification of the scope of information to be included in a COL application that references a design certification.

NINA has the capability to sub-contract, to procure, to schedule, and to manage the work associated with the detailed design (including licensing), procurement, and construction of STP Units 3 and 4. The staff's review of the applicant's organizational structure concluded that its management, technical support, and operating organizations are acceptable. The staff reviewed the applicant's QA program and found it acceptable. This QA program includes requirements that will be implemented by the applicants' EPC contractors. Therefore, the staff concludes that NINA is also technically qualified to engage in the activities associated with a COL for STP Units 3 and 4 in accordance with the provisions of 10 CFR 52.97(a)(1)(iv).

## 1.5S.2 Applicant Financial Review

### 1.5S.2.1 Financial Qualifications

Under 10 CFR 52.77, 10 CFR 50.33(f), and Appendix C to 10 CFR Part 50, "A Guide for the Financial Data and Related Information Required to Establish Financial Qualifications for Construction Permits and Combined Licenses," an applicant for a COL must demonstrate that it possesses or has "reasonable assurance" that it can obtain the funds necessary to construct and operate a nuclear power plant. Under 10 CFR 50.33(f) and Appendix C to 10 CFR Part 50, an applicant must identify the sources of its funding in the license application.

To establish their financial qualifications for construction, electric utility (utility) applicants have historically relied on state regulation of utility rates to recover the costs of reactor construction. For operation, 10 CFR 50.33(f) exempts utility applicants from having to address operational financial qualifications; this exemption is based on the utility's ability to recover costs through utility rates. Widespread deregulation of electricity markets in the past two decades, however, has resulted in a new class of nuclear "non-electric utility" license applicants for facilities known as "merchant plants" that sell the power they generate on the open market at unregulated prices. Unlike utilities, developers of merchant plants must rely on alternative forms of financing such as their own internal resources or third-party project finance investors. A "merchant applicant" is a non-regulated entity (i.e., non-regulated power producer) that engages in the business of producing, manufacturing, generating, buying, aggregating, marketing, or brokering electricity for sale at wholesale or retail rates to the public. A non-regulated power producer is not subject to regulation as is a public utility (e.g., regulated electric utility), except as specifically provided in the general laws.

Texas is a largely deregulated market, but there are some power providers (such as the City of San Antonio, Texas, acting by and through the City Public Service Board (CPS Energy)) that recover costs through utility rates set by a rate regulator. For STP Units 3 and 4, an electric utility, CPS Energy, owns 7.625 percent of the proposed units, while the other 92.375 percent is owned by merchant applicants.

Earlier in the STP Units 3 and 4 review, NINA attempted to meet the NRC's current financial qualifications requirements based on the following: (1) CPS Energy is an electric utility exempt from operational financial qualification requirements for the portion of the proposed units that it owns; (2) For the merchant applicants, which are responsible for the entirety of construction financial qualifications and are responsible for operational financial qualifications for the portion of the proposed units that they own, NINA proposed license conditions to demonstrate that the NRC's requirements are met.

As explained below, the NRC staff has concluded that CPS Energy is exempt from operational financial qualifications for the portion of the proposed units that it owns. However, the NRC staff was unable to conclude that NINA's proposed approach for the merchant applicants met the current financial qualification requirements, primarily due to an absence of specifically identified sources of funds.

By letters dated May 31, 2012, and November 13, 2012 (ADAMS Accession Nos. ML12173A416 and ML12334A187, respectively), NINA and the Nuclear Energy Institute (NEI), respectively, raised concerns regarding the financial qualification requirements for merchant plants. NEI and NINA stated that it is difficult if not impossible for merchant plant COL applicants to secure project funding to meet financial qualification requirements in advance of the initial license issuance, particularly when project construction will not begin immediately. Developers using project finance generally must demonstrate to lenders at financial closing that they have received all necessary regulatory approvals to begin construction, including, in the case of a new nuclear plant, a COL. Therefore, financial institutions are hesitant to commit the amounts of money required to construct a power plant before the COL is issued. The failure of an applicant to meet financial qualification requirements would preclude the applicant from obtaining the COL.

In response to the concerns raised by NEI and NINA, the staff provided the Commission with SECY-13-0124, "Policy Options for Merchant (Non-Electric Utility) Plant Financial Qualifications" (ML13093A158) in November 2013. SECY-13-0124 recommended that the Commission engage in rulemaking to modify the financial qualification requirements in 10 CFR Part 50. In April 2014, the Commission issued a Staff Requirements Memorandum (SRM) for SECY-13-0124 (ML14114A358) that accepted the staff's recommendation to engage in rulemaking and directed staff to make the financial qualifications requirements for reactors similar to the financial qualification requirements of 10 CFR Part 70 "Domestic Licensing of Special Nuclear Material." In the SRM, the Commission stated that applicants would be allowed to propose license conditions to address financial qualifications. In this SRM, the Commission also directed the staff to "consider utilizing an exemption process to address existing and emergent cases, as appropriate and necessary, during the pendency of the rulemaking process and that anticipates the outcome of the proposed changes to the current financial qualification regulations."

In response to that SRM, the staff has developed a draft regulatory basis entitled, "Proposed Financial Qualifications Requirements Included in the Draft Regulatory Basis for the Rulemaking on Financial Qualifications for Reactor Licensing," (ML15111A270) (Draft Regulatory Basis). As described in the Draft Regulatory Basis, the contemplated rulemaking would allow the NRC to issue a reactor license for an applicant with 50 percent or less of construction funding at the time of the application, and to include a license condition that would ensure that funding is available before beginning reactor construction rather than at the time of licensing. License conditions could also be used by applicants to address financial qualifications for reactor operations. The Draft Regulatory Basis is explained in more detail below.

On June 19, 2014 (ML14175A142), NINA requested an exemption from the current financial qualification requirements in 10 CFR 52.77, 50.33(f), and Part 50, Appendix C. On May 18, 2015 (ML15140A077), NINA submitted an updated exemption request that supersedes the June 19, 2014 request. The updated exemption request seeks to use a financial qualification standard similar to that in 10 CFR Part 70 and is based on the newly proposed standards in the Draft Regulatory Basis. This section of the SER evaluates the applicant's exemption request against the standards articulated in the Draft Regulatory Basis. Section 1.11S.5 of this SER documents the NRC staff's review of the exemption request against the exemption standards in 10 CFR 52.7 and 50.12.

<u>Compliance with the New Proposed Financial Qualifications Requirements</u>

On April 29, 2015, the staff held a public meeting entitled, "Meeting to Discuss the Proposed Financial Qualifications Requirements Included in the Draft Regulatory Basis for the Rulemaking on Financial Qualifications for Reactor Licensing" (ML15113A031). Before the meeting, the staff released the draft financial qualification standards that it intended to include in the Draft Regulatory Basis. At that meeting, the staff discussed these draft standards and received feedback from meeting attendees.

Staff explained that the current "reasonable assurance" review standard would be replaced with one that approximates, but does not reduce below, the financial qualification standard for 10 CFR Part 70 applications; that standard is "appears to be financially qualified." Staff also discussed requirements for classes of applicants identified through the staff's regulatory basis development efforts. One class included merchant applicants with 50 percent or less of construction financing at the time of application. NINA meets the definition of that applicant class, and representatives from NINA participated in the meeting.

Subsequently, NINA's updated exemption request of May 18, 2015 addressed the draft standards discussed at the meeting. These draft standards were ultimately included in the Draft Regulatory Basis with only editorial changes and corrections. The staff reviewed NINA's updated exemption request against the standards in the Draft Regulatory Basis.

The Draft Regulatory Basis was published in the *Federal Register* for comment on June 17, 2015 (80 FR 34559). The comment period closed on August 3, 2015, and three sets of comments were received (ML15190A386, ML15217A059, ML15222A298). The comments supported the NRC undertaking a rulemaking to amend the financial qualification requirements for nuclear reactors. Some comments advocated extending the proposed new requirements to non-power reactors, and eliminating financial qualification requirements for renewal of non-power reactor licenses. Some commenters also took positions on the standards articulated in the Draft Regulatory Basis. These commenters either supported the standards or proposed that the requirements be further reduced or even entirely rescinded. The public comments do not undermine the basis for the COL applicant's request for an exemption from the NRC's financial qualification requirements because they do not suggest imposing a stricter standard than the one applied to the review of STP Units 3 and 4.

For demonstrating financial qualifications for reactor construction, the applicant will provide information that demonstrates its financial capacity. A cost estimate will ensure that the applicant understands the size and scope of the project. The cost estimate should provide enough detail to provide the NRC staff with a good understanding of the costs and cost assumptions associated with construction. The applicant's Financial Capacity Plan (FCP) will further demonstrate the applicant's capacity, and in combination with the cost estimate, should provide the NRC with adequate information for it to conclude that the applicant appears to be financially qualified. An applicant's financial capacity reflects the applicant's level of understanding of the size and scope of the project including the level of capital necessary to undertake the project, and it reflects the organizational and human resources, experience, skills, and expertise required to obtain proper financing and ultimately finance the project, when appropriate. Additionally, as relevant to STP Units 3 and 4, "[f]or those applicants with 50 percent or less committed funding sources at the time of application, the NRC expects that the applicant will provide" proposed license condition(s) that will ensure that funding is available before beginning reactor construction.

For demonstrating financial qualifications for reactor operations, the staff's newly proposed standards in the Draft Regulatory Basis anticipate that:

> "…the applicant will provide:
>
> • Estimate for total annual operating cost for each of the first 5 years of operations and
>
> • Documentation of sources of funds to cover each of the first 5 years of operations. "

Additionally, as relevant to STP Units 3 and 4, "[i]f an applicant does not have finalized sources of funds for operations, the applicant could propose a license condition for operations. The applicant will submit an estimate for total annual operating cost for each of the first 5 years of operations…" along with a license condition that will ensure that adequate funds are available prior to initial fuel loading.

As presented in Section 6 (Basis for Proceeding with Rulemaking Alternative to Conform Power Reactor Financial Qualifications Requirements to 10 CFR Part 70 Standard) of the Draft Regulatory Basis, staff evaluated the basis for, and provided its analysis of why, the revised financial qualification standard is acceptable. In summary, the staff concluded that:

- The NRC has not found a direct correlation between licensees' pre-licensing financial reviews and later safe construction or operating performance and that, historically, the NRC has declared the correlation to be indirect. During construction of the current operating fleet, multiple entities experienced substantial cost overruns, with the cost of construction vastly exceeding the construction cost estimates that were used to determine their financial qualification (FQ). Due to rising costs, as well as other factors, multiple entities chose to suspend or cancel construction. However, there is no evidence that cost overruns led to safety problems during construction. For operations, one would expect to see regulated utilities, which are not subject to the same type of financial pressures as non-regulated utilities, operating more safely. NRC's experience to date has demonstrated this is not true.

- The revised review standard would not compromise public health and safety because the NRC maintains a number of programs and processes that more directly ensure safe construction and operation. These include a detailed technical licensing review, the construction reactor oversight process (cROP), the reactor oversight process (ROP), the resident inspector program, the operating experience (OpE) program, the vendor inspection program (VIP), and quality assurance (QA) inspections. These direct programs and processes have evolved over the last 40 years, reducing the need to rely on financial qualifications as a possible indirect measure of safety. In summary:

- o NRC's detailed technical licensing review for COL applications requires resolution of technical and safety issues before the beginning of reactor construction. Before initial operation, a newly-constructed nuclear plant must complete a series of tests and undergo NRC inspections to ensure consistency with the COL, which contains requirements for inspections, testing, analyses, and acceptance criteria. In part because it authorizes both construction and operation in a single license, the approval of a COL involves a much more detailed approval process than the approval of a construction permit; accordingly, it is easier for an inspector to determine whether construction is deviating from the approved plan as compared to the construction permit process wherein the construction permit holder has considerably more flexibility in how it constructs the units.

- o The cROP helps provide reasonable assurance that the facility has been constructed and will operate in conformance with the license. Resident inspectors oversee day-to-day licensee and contractor activities throughout construction, and other NRC specialists conduct periodic onsite inspections to ensure that the facilities are being constructed in accordance with the approved design. This oversight process provides a more risk-informed robust oversight regime than that used by the NRC during construction of the current operating fleet.

- o The ROP was implemented with the goal of providing an objective, risk-informed, understandable, and predictable approach to the oversight of nuclear power plant performance. Once a new reactor begins operating, and throughout its operating life, the ROP verifies that the plant is operating in accordance with the license and NRC regulations. Under the ROP, the NRC expects licensees to address effectively all issues that arise, whether of low or high safety significance. As the number of safety significant issues at a plant increases, the frequency of NRC inspections increases. NRC's supplemental inspections and other actions, if needed, ensure that significant performance issues are addressed promptly. The NRC has found that this is a more effective oversight process than its predecessor programs.

- o NRC's resident inspector program was initiated in order to increase the agency's knowledge of conditions at plants, improve the NRC's ability to independently verify the performance of plant personnel and equipment, and enhance the NRC's incident response capability. On a daily basis, NRC's resident inspectors observe activities at the plants and evaluate adherence to federal safety requirements. Resident inspector activities include visiting the control room and reviewing operator logbook entries, watching operators conduct plant operations, performing visual assessments of conditions in one or more areas of the plant, observing tests of or repairs to important systems or components, talking to plant employees regarding any safety concerns they may have, and checking corrective action documents to ensure that problems have been identified and appropriate fixes have been implemented. The resident inspectors serve as the agency's initial evaluators of plant events or incidents and as the first point of contact for plant employees' allegations of safety violations. Resident inspectors also bring identified safety-significant issues to the attention of plant management and communicate them, if necessary, to NRC management.

- The OpE serves to collect, evaluate, communicate, and apply operating experience information to help ensure safety. The program reviews information from a variety of sources related to domestic and international reactor operating experience and evaluates its relevance for the safe operation of U.S. reactor plants. Operating experience program evaluations provide insights that improve NRC safety assessments and inform decisions on how to improve licensing, inspection, and other regulatory programs. The use of information collected under this program allows the staff to provide accurate and timely information to the public and other interested parties on actual or potential hazards to health and safety.

- The VIP allows the staff to verify that reactor applicants and licensees are fulfilling their regulatory obligations to provide effective oversight of the supply chain. To accomplish this, the program includes targeted inspections of safety-related activities performed under vendors' quality assurance programs; identification and selection of vendors to sample the effectiveness of their domestic and international supply chains, both for the current fleet and new reactor construction; and assurance that vendor inspectors obtain the knowledge and skills necessary to perform effective inspections.

- Under the current NRC inspection program, the staff performs quality assurance (QA) inspections specifically to determine whether or not licensees and their contractors are meeting the Appendix B to 10 CFR Part 50 requirements. These inspections ensure that licensee and contractor QA plans, instructions, and procedures for specific safety-related activities conform to the applicable QA program and are implemented as prescribed in the QA program description. The NRC has established QA inspection procedures specifically for new reactor applications, and conducts inspections for early site permit and COL applications. The agency also conducts QA audits for pre-design certification and pre-COL reviews.

The NRC programs detailed above have proven to be effective in ensuring public health and safety during both construction and operation of nuclear reactors for many years; furthermore, these programs are subject to continuous review and improvement. The staff has determined that the standards set forth in the Draft Regulatory Basis are sufficient since these programs have or will be implemented at the appropriate time; the staff will have available for inspection, before the beginning of construction, a revised cost estimate and documentation that the licensee has obtained financing to fund the project; and staff will have available for inspection, before initial fuel load, an updated cost estimate for each of the first five years of operation and documentation of the sources of funds to cover these costs.

Based on information in the application and as supplemented in its May 18, 2015 exemption request, NINA believes that it meets the staff's proposed standard of "appears to be financially qualified" for construction and operation. Specifically, NINA presented a construction cost estimate as contained in its earlier application, and has provided both an applicant FCP and proposed license condition to verify sufficient construction funding. NINA has also presented an operational cost estimate and proposed license condition to verify sufficient operational funding.

Based on the information provided by the applicant and the staff analysis to follow, the staff has determined that NINA's COL application meets the proposed new financial qualification standard. As explained in Section 1.11S.5 of this SER, NINA also satisfies the exemption criteria in 10 CFR 52.7 and 50.12. NINA submitted proposed license conditions to address NRC financial qualifications. The conditions presented below will be imposed.

Applicant's Construction Financial Qualifications

NINA's approach to meeting the proposed construction financial qualification standards is to provide a construction cost estimate for the project, an FCP, and license conditions (as part of the FCP) to ensure sufficiency of funds before construction begins.

To be acceptable, NINA's FCP and cost estimate must provide the NRC with adequate information for it to conclude that the applicant appears to be financially qualified. NINA's financial capacity is not a predictive finding of the likelihood of an applicant ultimately obtaining financing. Rather, it reflects NINA's level of understanding of the size and scope of the project including the level of capital necessary to undertake the project, and it reflects the organizational and human resources, experience, skills, and expertise required to obtain proper financing and ultimately finance the project.

The NRC expects that the proposed license conditions will ensure that sufficient funding is available before beginning reactor construction. The NRC will rely on NINA's license conditions in order to find that the applicant has financial capacity when funding is not otherwise committed. As described below, the staff approves of NINA's approach to meeting NRC's new proposed financial qualification standard for construction. Moreover, NINA meets the requirements for an exemption from the current financial qualification requirements for construction (see exemption request evaluation in Subsection 1.11S.5 in this safety evaluation).

Construction Cost Estimate

Revision 12, Part 1, Table 1.3-1 of the COL application provided a construction cost estimate with breakdown as to engineering, procurement, and construction costs. In addition, NINA also provided estimates of initial nuclear fuel costs. Cost data presented in NINA's application is also provided in the February 2011 U.S. Department of Energy Loan Guarantee Draft Term Sheet for this project. The following are NINA's projected costs of construction for both units:

| Cost Components for STP Units 3 and 4 | Millions in 2011 U.S. $ |
|---|---|
| Engineering, Procurement, and Construction | [ ] |

| | |
|---|---|
| - Owner's Execution Cost and Other Such Costs* <br><br> - Owner's Cost - Contingency <br><br> - Initial Nuclear Fuel | [ ] <br><br><br> [ ] <br><br> [ ] |
| Owner's Cost Subtotal | [ ] |
| Interest During Construction, Reserves, and Financing Fees | [ ] |
| Total Project Costs | [ ] |

* Includes property taxes, sales taxes, spare parts, banking fees, legal fees, common facility purchases and insurance.

NRC staff evaluated the construction cost data provided in NINA's application against construction cost data and estimates developed by independent sources, as well from one other recent review of power plant construction data performed by staff, for comparison and to determine the reasonableness of NINA's estimate. Staff consulted data generated in the 2004 examination of nuclear power plant costs by the Energy Information Agency (EIA) of the U.S. Department of Energy (DOE) as part of its "2004 Annual Energy Outlook," and a 2009 Massachusetts Institute of Technology (MIT) study.[6] Staff also reviewed staff's analysis of the Detroit Edison Company Fermi 3 (Fermi) application construction cost data, a power plant expected to operate at an estimated gross electrical power output of approximately 1,535 megawatts electric (MWe).

In Part 2, Subsection 1.1.10, "Core Thermal Power Levels," of the ABWR Design Certification Document, the ABWR design thermal output is 3,926 Mega-Watt thermal (MWt), and the net electric output is approximately 1,300 MWe. Accordingly, STP Units 3 and 4 are expected to operate at this power level.

In the DOE report, EIA assumes that construction of nuclear plants will cost about $1,719 per Kilo-Watt electric (kWe) (inclusive of all contingencies) as a result of learning, by 2019. Even if no nuclear plants were built in the United States (i.e,, no efficiencies are gained as a result of learning from previous construction), EIA assumes that costs would be about $1,752 per kWe by 2019. In the most recent MIT study, costs of construction for nuclear facilities were estimated at $4,000 per kWe, appreciably more than estimated in the EIA report. Finally, as part of the Detroit Edison Company Fermi 3's application review, staff determined that the cost of constructing a plant comparable to Fermi 3, at 1,535 MWe, is in the range of $3,222/kWe to $5,072/kWe installed.

NINA's total cost estimate of both units of [ ], or approximately [ ] exceeds both the EIA and MIT cost estimates of $1,752 and $4,000 per kWe, respectively, as well as the $3,222/kWe to $5,072/kWe range of cost reflected in the Fermi 3 application review.

[6] "The Future of Nuclear Power," (Massachusetts Institute of Technology, updated 2009).

Accordingly, based on a review of available nuclear power reactor construction cost information by independent sources, and reliance on a review of a recent cost analysis performed by staff, the staff concluded that the construction cost estimate presented by NINA in its application for both STP Units 3 and 4 appears reasonable.

Financial Capacity Plan (FCP)

In its May 18, 2015, amended exemption request, NINA included the document entitled, "NINA Financial Capacity Plan for Construction of STP Units 3 & 4," (NINA's FCP). This document demonstrates NINA's level of understanding of the size and scope of construction of STP Units 3 and 4, including the level of capital necessary to undertake the project. It also addresses the financial capacity of both NRG Energy, Inc. (NRG) and Toshiba Corporation (Toshiba), majority and minority owners, respectively, of NINA. The plan also discusses the organizational and human resources, experience, skills, and expertise required to finance the project. The plan includes a description of the management team as it pertains to financing, and the team's experience and expertise in the areas of finance, capital sourcing, and large build projects. As 92.375% indirect owners of STP Units 3 and 4, NRG and Toshiba appear to be financially capable and knowledgeable investors, as does NINA in total.

Financial Capacity of NRG, Toshiba, and NINA

Per NINA's FCP, NRG has substantial experience in developing large energy infrastructure projects, and as of its 2014 Annual Report, had more than $15 billion in total operating revenues and more than $20 billion in long term debt. NRG owns and operates more than 52,000 MW of installed electrical capacity, and as of end-of-year 2014, had committed approximately $1 billion in capital for more than ten major power projects that were then underway. Additionally, Toshiba has substantial experience in developing large infrastructure projects around the globe. Toshiba is a world leading energy and infrastructure company. Per its 2014 annual report, Toshiba's Energy and Infrastructure business segment generated more than $16.5 billion in revenues in FY 2013. Toshiba states that it has "delivered approximately two dozen nuclear power reactors," including acting as the prime contractor for 17 units. Toshiba has participated in the development of three Advanced Boiling Water Reactor units that have achieved commercial operation in Japan (Kashiwazaki-Kariwa Unit Nos. 6 and 7, and Hamaoka Unit No. 5.) Toshiba also is a leading supplier of thermal power plants. In total, NINA states that Toshiba has supplied "combined power generation capacity" of 174 GW at 1,914 units in 42 countries.

NINA itself has had significant experience in arranging the financing for the construction and operation of STP Units 3 and 4. NINA negotiated a detailed loan guarantee term sheet and conditional loan commitment with the U.S Department of Energy (DOE) Loan Programs Office. NINA states that the DOE term sheet was reviewed and approved by several stakeholders and was at a very advanced stage just prior to the March 11, 2011, Great Tohoku Earthquake and Tsunami. NINA states that that event occurred two business days before the scheduled final approval by the last Intra-Governmental Committee required for issuance of the conditional loan guarantee. NINA has also had experience negotiating with the Japan Bank for International Cooperation (JBIC) and with Nippon Export and Insurance (NEXI) to provide loans and insurance for STP Units 3 and 4. NINA previously received support letters from both JBIC and NEXI, providing further evidence with regard to its financial capacity. NINA has also been managing the engineering, procurement, and construction contract and procurement of long lead items for STP Units 3 and 4, and has spent hundreds of millions of dollars to date on services associated with STP Units 3 and 4.

Consultants and Consultant Services

With regard to expert and experienced consultants, NINA reports that it uses many expert consultants to support various aspects of project development and will continue to do so as needed and appropriate for STP Units 3 and 4. NINA identified Deloitte as one of its current contractors for business development. Deloitte is a large consulting firm that provides numerous financial services including assisting clients in the development of strategies and plans for financing projects. NINA cites Deloitte's Power and Utilities practice as servicing all of the top 10 and 96% of the Fortune 1000 power and utilities companies, and audits six of the top 10 Fortune 1000 power and utilities companies. In addition, Deloitte provides accounting and enterprise risk services to 79% of the Fortune 1000 power and utilities companies, provides consulting services to 83% of the Fortune 1000 power and utilities companies, and provides financial advisory services to 68% of the Fortune 1000 power and utilities companies.

Anticipated Funding Strategy and Funding Sources

NINA anticipates obtaining funding for STP Units 3 and 4 through a project financing model that likely will involve loans issued under the DOE and JBIC, and other loans backed by insurance issued by NEXI. NINA's management team has had substantial experience negotiating with these organizations and successfully obtaining financing in the past. Specifically, NINA negotiated a detailed loan guarantee term sheet and conditional loan commitment with the DOE Loan Programs Office, and has had experience negotiating with the JBIC and NEXI to provide loans and insurance for STP Units 3 and 4; NINA states that it previously received support letters from both JBIC and NEXI for this project. Furthermore, the NINA FCP states that NRG has successfully financed three major solar projects with loans issued under the DOE Loan Guarantee Program. NINA states that NRG has also obtained a $167 million DOE grant, a loan from JBIC, and a loan backed by NEXI, for a $1 billion carbon capture project (WA Parish Carbon Dioxide Capture Project, Thompsons, TX) that NRG is developing with JX Nippon Oil & Gas Exploration Corporation.

Based on the information provided in NINA's FCP, the staff concludes that, as stated by NINA, "NINA's management team has an understanding of the complexities of financing a large nuclear power plant, the challenges in raising capital, and the need for ensuring financing before beginning reactor construction." Further, NINA appears to have a good understanding of the funding requirements for the STP Units 3 and 4 project, as well as experience in finding financial backers and securing required capital.

License Conditions

NINA proposes the following license condition in connection with the requested exemption from the financial qualification requirements in 10 CFR 52.77, 50.33(f), and Part 50, Appendix C:

> The licensee will notify the NRC at least 60 days prior to its anticipated date of construction that the license condition has been fulfilled and that the following are available for inspection:

- An updated cost estimate;
- Documentation identifying any material variances from the original cost estimate provided in the application; and
- Documentation demonstrating that the licensee has secured financing to fund the updated cost estimate for the project. This documentation will include operative closing documents, and may include documented proof of parent and affiliate assurances, or capital from other sources (as required to close the financing) that reflect financing for the project.

This license condition is nearly identical to the staff's proposed license condition in the Draft Regulatory Basis, with one notable exception. In its proposed license condition, NINA replaces the word "justifying" with "identifying" when considering variances from the original cost estimate. Staff considers this change significant, and does not find that change acceptable. Staff believes that justification of identified variances in the construction cost estimate provides additional supporting confirmation of the applicant's understanding of the costs and funding needs of the project, including changes in cost and financing requirements. The condition that the licensee not only identify variances, but also justify and explain them, provides further evidence of NINA's financial capacity, and ensures that any material cost variances are well understood and justified by the applicant prior to construction. Accordingly, the proposed license condition above is acceptable, with the exception that "justifying" shall replace "identifying" in the second bullet.

NINA also included the modifier "material" before "variances" in the second bullet. The staff has determined that the adjective "material" in describing "variances" is an acceptable addition to the proposed license condition, and should be included. The identification and justification of "any" and all cost variances within the multi-million dollar project cost data estimate, from the time of the original estimate, would require an exhaustive list detailing a significant number of minor or immaterial variances. Such documentation would provide little benefit to NRC reviewers, would not serve NRC's public health and safety mission, and would provide little insight into the total project or the applicant's ability to meet construction cost requirements. There are also other minor wording differences between the applicant's proposed license condition and the one in the Draft Regulatory Basis, but these differences are not material.

An updated cost estimate is the basis for determining the applicant's capital requirements for undertaking the project, and forms the basis for determining whether the licensee will have the funds necessary to begin reactor construction. The documentation demonstrating that the licensee has secured financing ensures the availability of funds to begin reactor construction. The purpose of meeting this license condition is to confirm the licensee's financial capacity in its understanding of the financial requirements of the project, and in its ability to initiate and complete construction activities for the licensed site.

Based on this information, the following will be made a condition of the license:

NINA shall notify the NRC at least 60 days prior to its anticipated date of construction that the license condition has been fulfilled and that the following are available for inspection:

- An updated cost estimate;
- Documentation justifying any material variances from the original cost estimate provided in the application; and
- Documentation demonstrating that the licensee has secured financing to fund the updated cost estimate for the project. This documentation will include operative closing documents, and may include documented proof of parent and affiliate assurances, or capital from other sources (as required to close the financing) that reflect financing for the project.

The original cost estimate of record reflected in this license condition is provided in Table 1.3-1 of Part 1 of the COL application, Revision 12.

<u>Conclusion - Construction Financial Assurance Qualifications</u>

Staff has evaluated NINA's construction cost estimate, its financial capacity, and its proposed license condition. Staff concludes that NINA's construction cost estimate for the project is reasonable. Based on NINA's financial capacity as presented in its FCP, staff concludes that NINA has an understanding of the complexities of financing a large nuclear power plant, the challenges in raising capital, and the need for ensuring financing before beginning reactor construction. NINA appears to have a good understanding of the funding requirements for the STP Units 3 and 4 project, and it and its parents and consultants have experience in finding financial backers and securing required capital.

Finally, the license condition proposed by NINA and as revised by NRC staff, ensures that adequate construction funds will be available to NINA before it begins reactor construction of STP Units 3 and 4.

For the above reasons, the staff concludes that NINA, and by extension the other STP 3 and 4 applicants on whose behalf NINA is acting, appear to be financially qualified for construction.

<u>Applicant's Operational Financial Qualifications</u>

Staff evaluated CPS Energy's operating financial qualifications pursuant to 10 CFR 50.33(f)(3):

> If the application is for a combined license under Subpart C of Part 52 of this chapter, the applicant shall submit the information described in paragraphs (f)(1) and (f)(2) of this section.

Pursuant to 10 CFR 50.33(f):

> Except for an electric utility applicant for a license to operate a utilization facility of the type described in 10 CFR 50.21(b) or 50.22, information

> sufficient to demonstrate to the Commission the financial qualification of the applicant to carry out, in accordance with the regulations in this chapter, the activities for which the permit or license is sought.

10 CFR 50.2, "Definitions" states, in part, what an electric utility is:

> [A]ny entity that generates or distributes electricity and which recovers the cost of this electricity, either directly or indirectly, through rates established by the entity itself or by a separate regulatory authority.

According to the COL application, CPS Energy is the trademarked name through which the City of San Antonio, acting by and through the City Public Service Board, does business. CPS Energy is a Texas municipal utility and an independent Board of the City of San Antonio. CPS Energy generates and distributes electricity and recovers the cost of this electricity through rates approved by its rate regulator, the City of San Antonio, thus meeting the definition of an "electric utility" in 10 CFR 50.2.

Based on the above information, the NRC staff finds that the applicant, CPS Energy, which will own 7.625% of STP Units 3 and 4, is an electric utility and its share of operational costs is not subject to operational financial qualification requirements pursuant to 10 CFR 50.33(f).

NINA requested an exemption from the FQ requirements in 10 CFR 52.77 and 50.33(f) and 10 CFR Part 50, Appendix C, to allow use of a standard similar to that contained in 10 CFR Part 70 for operation of STP Units 3 & 4, including use of license conditions. Like construction, that approach is similarly supported by the Commission in its April 24, 2014, SRM and by the Draft Regulatory Basis.

NINA's approach to meeting financial qualification requirements for operations reflects the staff's position in the Draft Regulatory Basis for merchant applicants without finalized sources of funds. In that document, the following are identified by staff as necessary for ascertaining the financial qualifications for such applicants:

> If an applicant does not have finalized sources of funds for operations, the applicant could propose a license condition for operations. The applicant will submit an estimate for total annual operating cost for each of the first 5 years of operations along with the following license condition:
>
> - The licensee will notify the NRC at least 60 days prior to initial loading of fuel that the license condition has been fulfilled and that the following are available for inspection:
>     - An updated cost estimate for each of the first 5 years of operations;
>     - Documentation justifying any variance from the original cost estimate provided in the application; and
>     - Documentation of sources of funds to cover each of the first 5 years of operations. Such funds could come from, but are not limited to, power purchase agreements, parent

assurances, and/or revenues from the anticipated sale of power.

If the applicant does not have finalized sources of funding for operations at the time of application, this condition will ensure that adequate funds are available prior to initial fuel loading.

The following Projected Income Statement provided by NINA estimates revenue, cost (expense), and income data for each of the first 5 years of operations for its share (92.375%) of operations (data provided in letter dated January 17, 2012, ADAMS Accession No. ML12025A025):

STP UNITS 3 AND 4
(SUMMARY OF) PROJECTED INCOME STATEMENT
(First 5 full years of operations - In $millions)

| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
|---|---|---|---|---|---|
| Total Revenue | [ ] | [ ] | [ ] | [ ] | [ ] |
| Expenses | [ ] | [ ] | [ ] | [ ] | [ ] |
| Income Before Taxes | [ ] | [ ] | [ ] | [ ] | [ ] |
| Net Income | [ ] | [ ] | [ ] | [ ] | [ ] |

Expenses include fixed and variable operations and maintenance costs. The projected data provided above were prepared by two companies, Blackstone Advisory Partners LLC and SAIC, with input from NINA.

Nuclear plant production costs from 2012 through 2014, including operations and maintenance costs and fuel costs, but not including capital and indirect costs, ranged from 1.93 to 3.13 cents per kilowatt-hr., based upon nuclear industry cost data compiled by the Nuclear Energy Institute per Federal Energy Regulatory Commission Form 1 filings data. Based on this information and the anticipated Unit 3 and Unit 4 plant capacity of 1,300 MWe each, the staff concluded that NINA's projected share of operational costs reflected above was reasonable.

License Conditions

NINA proposes the following license condition in connection with requested exemptions from the financial qualification requirements in 10 CFR 52.77 and 50.33(f), as applied to operations:

> The licensee will notify the NRC at least 60 days prior to initial loading of fuel that the license condition has been fulfilled and that the following are available for inspection:
>
> - An updated cost estimate for each of the first 5 years of operations;
> - Documentation identifying any variance from the original cost estimate provided in the application; and
> - Documentation of sources of funds to cover each of the first 5 years of operations. Such funds may come from, but are not limited to, power purchase agreements, parent assurances, and/or revenues from the anticipated sale of power.

With one notable exception, explained below, this proposed license condition is materially identical to the license condition in the Draft Regulatory Basis. This proposed license condition will ensure that adequate funds are available prior to initial fuel load. An updated cost estimate establishes the basis for determining that the licensee has adequate funds necessary to cover operating and maintenance expenses and ensures that the licensee can operate and maintain the plant after completion of construction. NINA's estimates for total annual operating costs for each of the first 5 years of operations, and license conditions requiring documentation prior to initial fuel load that cost variances are understood and that funding to meet operational costs will be available, ensure that NINA has a realistic understanding of the costs associated with operations, and the financial capacity to provide coverage of those costs. The NRC will rely on NINA's license condition to verify that the applicant has sufficient funds to operate the facility. Staff approves of NINA's approach to meeting NRC's new proposed standard of financial qualification requirement for operations. Moreover, NINA meets the requirements for an exemption to the current financial qualification requirements for construction (see Subsection 1.11S.5 in the safety evaluation report for the exemption request evaluation).

However, NINA indicated in its proposed license condition that it would provide documentation "identifying" variances from the original cost estimate, not "justifying" any variances as staff recommended in the Draft Regulatory Basis. For reasons similar to those cited for the construction license condition, this change is not acceptable to the staff. The staff relies on both the identification of, and the justification for, such changes. The condition that the licensee not only identify variances, but justify and explain them, provides further confirmation of NINA's financial capacity, and ensures that any material cost variances are well understood and justified by the applicant prior to fuel load.

In addition, although not proposed by the applicant for the operational financial qualifications license condition, the staff has determined that the adjective "material" in describing "variances" is an acceptable addition to the proposed license condition, and should be included. The identification and justification of "any" and all cost variances within the multi-million dollar project cost data estimate, from the time of the original estimate, would require an exhaustive list detailing a significant number of minor or immaterial variances. Such documentation would provide little benefit to NRC reviewers, would not serve NRC's public health and safety mission, and would provide little insight into the total project or the applicant's ability to meet operations cost requirements.

Therefore, the staff is adopting NINA's proposed license condition, with the exception that it is changing "identifying" to "justifying," and including the adjective "material" immediately before the word "variances."

Based on this information, the following will be made a condition of the license:

> NINA shall notify the NRC at least 60 days prior to initial loading of fuel that the license condition has been fulfilled and that the following are available for inspection:
>
> - An updated cost estimate for each of the first 5 years of operations;
> - Documentation justifying any material variance from the original cost estimate provided in the application; and
> - Documentation of sources of funds to cover each of the first 5 years of operations. Such funds may come from, but are not

limited to, power purchase agreements, parent assurances, and/or revenues from the anticipated sale of power.

The original cost estimate of record reflected in this license condition is provided in a January 17, 2012, letter from NINA (ADAMS Accession No. ML12025A025).

Conclusion – Operations Financial Assurance Qualifications

In view of NINA's seeking an exemption to current financial qualification requirements, NINA provided cost estimates for each of the first 5 years of operations and proposed license conditions reflecting staff's regulatory basis development efforts cited earlier. The license condition proposed by NINA, as modified by the staff, ensures that, as a merchant applicant that does not have finalized sources of funds for operations, NINA will have the funds necessary to cover operating and maintenance expenses, and ensures that the licensee can operate and maintain the plant after completion of construction.

For the reasons given above, the staff concludes that CPS Energy is exempt from operational financial qualification requirements for its share of operational costs. The staff also concludes that NINA meets the standards in the Draft Regulatory Basis for construction financial qualifications and for its portion of operational financial qualifications. Therefore, the staff concludes that NINA, and by extension the other STP 3 and 4 applicants on whose behalf NINA is acting, appear to be financially qualified. Section 1.11S.5 of this SER contains the staff's evaluation of the exemption criteria in 10 CFR 52.7 and 50.12.

### 1.5S.2.2 Decommissioning Funding

This safety evaluation addresses the applicants' plan for decommissioning funding assurance as required under 10 CFR 52.77, 10 CFR 50.33(k)(1), and 10 CFR 50.75, "Reporting and recordkeeping for decommissioning planning."

Pursuant to 10 CFR 52.77, COL applicants are required to provide information required under 10 CFR 50.33. Specifically, in accordance with 10 CFR 50.33(k)(1), NINA's application must provide "… information in the form of a report, as described in § 50.75, indicating how reasonable assurance will be provided that funds will be available to decommission the facility." In accordance with 10 CFR 50.75(b)(1), the report cited in § 50.33(k)(1), "…must contain a certification that financial assurance for decommissioning will be provided no later than 30 days after the Commission publishes notice in the *Federal Register* under § 52.103(a), in an amount which may be more, but not less, than the amount stated in" § 50.75(c)(1), known as the NRC minimum formula amount. That amount must be adjusted using a rate at least equal to the adjustment factor in § 50.75(c)(2), known as the minimum formula adjustment factor.

In accordance with 10 CFR 50.75(b)(3), the adjusted minimum formula amount must be covered by one or more of the methods described in 10 CFR 50.75(e) "as acceptable to the NRC." Under 10 CFR 50.75(b)(4), a COL applicant need not obtain the financial instrument used to satisfy 10 CFR 50.75(e) or submit a copy of the instrument to the Commission. However, after issuance of the COL, 10 CFR 50.75(e)(3) requires the holder of the COL to submit an update to the certification provided in its COL application, including a copy of the financial instrument to be used for providing financial assurance. This information must be submitted two years before and one year before scheduled fuel load.  In addition, 10 CFR 50.75(e)(3) requires the COL holder to submit, no later than 30 days after the Commission publishes notice in the *Federal Register* under 10 CFR 52.103(a), a report containing a certification that financial assurance for decommissioning is being provided in an amount specified in the licensee's most recent updated certification, including a copy of the financial instrument obtained to satisfy 10 CFR 50.75(e).

The NRC staff applied the guidance in NUREG-1577, Revision 1, "Standard Review Plan on Power Reactor License Financial Qualifications and Decommissioning Funding Assurance," issued March 1999, to evaluate the applicants' plan for decommissioning funding assurance.

The applicants who are responsible for decommissioning funding are the facility owners CPS Energy, and NINA's subsidiaries, NINA Texas 3 LLC (NINA 3) and NINA Texas 4 LLC (NINA 4).

As proposed facility owners, applicants CPS Energy, NINA 3, and NINA 4 must meet the NRC's decommissioning funding assurance requirements per 10 CFR 50.75.  The application states that each owner will provide decommissioning funding assurance for its proportionate obligation for decommissioning based upon its ownership percentage interests.  CPS Energy proposes to fund each unit using the external sinking fund method as provided for in 10 CFR 50.75(e)(1)(ii).  CPS Energy qualifies to use this as its exclusive mechanism under the provisions of 10 CFR 50.75(e)(1)(ii)(A), because it is a municipality that establishes its own rates and is able to recover its cost of service allocable to decommissioning.

In Revision 12, Part 2, Subsection 1.4 of the application, NINA states:

> In accordance with the terms of 10 CFR 50.75(e)(1)(vi), NINA 3 and NINA 4 will provide decommissioning funding assurance for their proportionate obligations for decommissioning based upon their percentage interests of 92.375% … using the external sinking fund method consistent with the provisions of 10 CFR 50.75(e)(1)(ii), except that NINA 3 and NINA 4 will not ordinarily collect funding from ratepayers.  In accordance with the requirements of 10 CFR 50.75(e)(1)(ii), NINA 3 and NINA 4 will set aside funds periodically, no less frequently than annually, in a trust fund account segregated from their assets and outside of their administrative control and in which the total amount of funds will be sufficient to fund decommissioning at the time permanent cessation of operations is expected. However, the funds periodically set aside are expected to be generated from sales of power.

Based on information provided in the application, NINA 3 and NINA 4 will not qualify as electric utilities and thus will be unable to collect estimated decommissioning costs through rates established by "cost of service."  However, NINA goes on to say that:

> Although NINA 3 and NINA 4 will not ordinarily collect funds from ratepayers as required by 10 CFR 50.75(e)(1)(ii)(A), exclusive reliance on this mechanism should be acceptable, because Texas Law provides a mechanism whereby NINA 3 and NINA 4 can elect to set aside funds under the jurisdiction and oversight of the PUCT [Public Utility Commission of Texas], and pursuant to this mechanism, Texas law

> provides that ratepayers would be obligated to fund the total cost of decommissioning in the event that NINA 3 and NINA 4 fail to periodically set aside funds as planned…. Thus, if NINA 3 and NINA 4 do not provide periodic funding from their own revenues, Texas Law would provide for a mechanism for funding decommissioning that does meet the requirements of 10 CFR 50.75(e)(1)(ii)(A).

Based on its status as a non-electric utility, methods available to NINA 3 and NINA 4 to meet decommissioning funding assurance requirements as listed in § 50.75(e)(1) include: § 50.75(e)(1)(i) prepayment; § 50.75(e)(1)(iii) surety method, insurance, or other guarantee method; § 50.75(e)(1)(v) contractual obligation(s) on the part of a licensee's customer(s); or § 50.75(e)(1)(vi) other funding mechanism or combination of mechanisms that provides assurance of decommissioning funding equivalent to the mechanisms in § 50.75(e)(1)(i) through (v), as determined by the NRC. NINA 3 and NINA 4 have chosen to provide decommissioning funding assurance through use of another funding mechanism or combination of mechanisms per § 50.75(e)(1)(vi). In developing this safety evaluation, the staff evaluated information provided by NINA in its application and in response to staff questions provided by letter dated August 4, 2015 (ML15222A155).

<u>Decommissioning Funding Estimate</u>

The applicant stated that NINA 3 will own 92.375% of Unit 3, NINA 4 will own 92.375% of Unit 4, and CPS Energy will own 7.625% of both units, and that they will provide decommissioning funding assurance in an amount not less than the NRC minimum formula amount calculated pursuant to 10 CFR 50.75(c). NINA identified in its application the minimum formula amount in 2009 dollars, and indicated that each owner of a share in each unit will provide its pro rata share of the decommissioning funding assurance based upon the ratio of its percentage ownership share to the total formula amount for such unit. NINA applied the appropriate minimum formula amount of $135,000,000 (1986 dollars) and adjustment factor, both prescribed in 10 CFR 50.75(c). The NRC staff calculated the minimum acceptable funding under 10 CFR 50.75(c) and finds the applicant's calculated amount per unit of $559,906,800, which covers 100% of the NRC minimum formula amount, to be correct. CPS Energy, NINA 3, and NINA 4 will be responsible for providing funding to meet their respective shares of decommissioning funding for the units.

<u>Funding Method per 10 CFR 50.75(e)(1) for CPS Energy</u>

CPS Energy qualifies to use the sinking fund method as its exclusive mechanism under the provisions of 10 CFR 50.75(e)(1)(ii)(A), because it is a municipality that establishes its own rates and is able to recover its cost of service allocable to decommissioning. In accordance with the requirements of 10 CFR 50.75(e)(1)(ii), the application states that CPS Energy will set aside funds periodically, at least annually, in a trust fund account segregated from its assets and outside its administrative control. The application further states that the total amount of funds will be sufficient to fund decommissioning at the time permanent cessation of operations is expected.

The NRC staff finds this funding method acceptable for CPS Energy, and concludes that CPS Energy satisfies the funding method requirement in 10 CFR 50.75 for decommissioning funding assurance.

Funding Method per 10 CFR 50.75(e)(1) as Proposed by NINA for NINA 3 and NINA 4

NINA 3 and NINA 4 propose to use an external sinking fund method consistent with the provisions of 10 CFR 50.75(e)(1)(ii), with the exception that NINA 3 and NINA 4 will not ordinarily collect funding from ratepayers in accordance with 10 CFR 50.75(e)(1)(ii)(A). NINA indicates that funds periodically set aside for NINA 3 and NINA 4's portion of decommissioning STP Units 3 and 4 are expected to be generated from sales of power. NINA states that additional assurances exist from the State of Texas (citing Texas Utility Code § 39.206 and Public Utility Commission (PUC) Substantive Regulation 25.304) that should allow it to rely on the sinking fund as a funding mechanism. Specifically, NINA states that Texas Law provides a mechanism whereby NINA 3 and NINA 4 can elect to set aside funds under the jurisdiction and oversight of the Public Utility Commission of Texas. Texas regulations (PUC Substantive Regulation 25.304(m)(1)) further state that:

If the PGC [Power Generation Company] fails to meet its annual funding requirements and if the state assurance obligations are insufficient to meet the annual funding obligations or are otherwise not honored, the [Texas Public Utility] commission shall determine the manner in which any shortfall in the cost of decommissioning a nuclear generating unit shall be recovered from retail electric customers in the state.On this basis, NINA states that NINA 3 and NINA 4 will provide decommissioning assurance in accordance with 10 CFR 50.75(e)(1)(vi), which allows for the use of any other mechanism, or combination of mechanisms, that provides, as determined by the NRC upon its evaluation of the specific circumstances, assurance of decommissioning funding "…equivalent to that provided by the mechanisms specified…" in 10 CFR 50.75(e)(1)(i) through (v).

Staff evaluated the method per 10 CFR 50.75(e)(1)(vi) as proposed by NINA. Specifically, staff considered the Texas code and regulations associated with nuclear decommissioning, and sought greater clarification about the Texas law on these issues. Staff analyzed whether NINA 3 and NINA 4 could reasonably assure that funding will be available for decommissioning if NRC approved of its proposed funding method that relies on (1) the use of the external sinking fund method consistent with the provisions of 10 CFR 50.75(e)(1)(ii), and (2) assurance based upon State of Texas nuclear decommissioning regulations.

Staff first evaluated whether NINA's reliance on the Texas decommissioning funding regulations, coupled with its use of the sinking fund method, would provide per 10 CFR 50.75(e)(1)(vi), equivalent decommissioning funding assurance provided by the funding methods in 10 CFR 50.75(e)(1)(i) through (v). As cited earlier, in accordance with the terms of 10 CFR 50.75(e)(1)(vi), NINA 3 and NINA 4 will provide decommissioning funding assurance for their proportionate obligations for decommissioning based upon their percentage interests of 92.375% in Unit 3 and Unit 4, respectively, using the external sinking fund method consistent with the provisions of 10 CFR 50.75(e)(1)(ii), except that NINA 3 and NINA 4 will not ordinarily collect funding from ratepayers. In accordance with the requirements of 10 CFR 50.75(e)(1)(ii), NINA 3 and NINA 4 will set aside funds periodically, no less frequently than annually, in a trust fund account segregated from their assets and outside of their administrative control and in which the total amount of funds will be sufficient to fund decommissioning at the time permanent cessation of operations is expected. This approach as proposed by NINA meets the requirements for use of the sinking fund method per 10 CFR 50.75(e)(ii) with the exception that NINA 3 and NINA 4 will not ordinarily collect funding from ratepayers.

The only issue remaining is whether the Texas method provides assurance of decommissioning funding equivalent to that provided by the ratepayer method described in 50.75(e)(1)(ii)(A).

NINA states that, "Texas Law provides a mechanism whereby NINA 3 and NINA 4 can elect to set aside funds under the jurisdiction and oversight of the PUCT, and pursuant to this mechanism, Texas law provides that ratepayers would be obligated to fund the total cost of decommissioning in the event that NINA 3 and NINA 4 fail to periodically set aside funds as planned. … [I]f NINA 3 and NINA 4 do not provide periodic funding from their own revenues, Texas Law would provide for a mechanism for funding decommissioning that does meet the requirements of 10 CFR 50.75(e)(1)(ii)(A)."

Specifically, State of Texas PUC Substantive Regulation 25.304(l) provides assurance that, should the PGC be in default of its annual funding obligation, payments into the fund will be authorized by the PUC from Texas state assurance obligations until the PGC is not in default, or until the assurance obligation is depleted. Furthermore, the state assurance obligation, which serves as an important source of funding should NINA 3 and NINA 4 be unable to meet their annual funding obligations, must be funded by NINA 3 and NINA 4, per PUC Substantive Regulation 25.304(k), in an amount that satisfies "…16 years of annual decommissioning funding." Additionally, should the state assurance obligation be depleted, State of Texas PUC Substantive Regulation 25.304(m) provides that the PUC "shall determine the manner in which any shortfall in the cost of decommissioning a nuclear generating unit shall be recovered from retail electric customers in the state."

Based upon this information, staff determined that NINA's use of a sinking fund coupled with reliance upon State of Texas nuclear decommissioning law, provides decommissioning funding assurance that is equivalent to the mechanisms set forth in 10 CFR 50.75(e)(1)(i) through (v). Under this mechanism, in the event NINA 3 and NINA 4 are unable to fund their decommissioning fund obligations through use of the sinking fund, State of Texas law authorizes annual decommissioning fund payments into the decommissioning trusts committed to NINA 3 and NINA 4 decommissioning activities, with ultimate recourse to Texas ratepayers.

Following its determination that NINA's proposed approach provided assurance equivalent to other NRC decommissioning funding assurance mechanisms per 10 CFR 50.75(e)(1)(vi), staff evaluated whether NINA 3 and NINA 4 could in fact meet the Texas nuclear decommissioning funding requirements. Staff had questions regarding NINA 3 and NINA 4's ability to: 1) comply with the state funding assurance obligation requirements in Texas PUC Substantive Rule 25.304(k), and 2) confirm, as required by PUC Substantive Rule 25.304(h)(2), that there has been an NRC finding of "reasonable assurance" of NINA 3 and NINA 4's financial qualifications.

With regard to the state funding assurance obligation, NINA 3 and NINA 4 are required by PUC Substantive Regulation 25.304(k) to:

> …provide additional financial assurances that funds will be available to satisfy 16 years of annual decommissioning funding, based on the most recent annual decommissioning funding amount approved by the commission (the state assurance obligation amount). The state assurance obligation amount will be the discounted value of annual decommissioning funding for the relevant period up to 16 years.

To meet this Texas requirement, NINA 3 and NINA 4 would need to satisfy the state assurance obligation by one or more of the following assurance methods (stated in abbreviated fashion):

1) Deposit the required amount of funds into an escrow account, a government fund, or other similar account (i.e., prepayment);

2) Show that the PGC, or a parent or supporting corporation (as applicable), is financially qualified to provide the state assurance obligation in the required amount;

3) Provide an adequate surety, insurance, or other guarantee method, with a minimum credit agency rating; or

4) Use "any other method" acceptable to the Texas PUC.

Staff wanted to know how NINA 3 and NINA 4 would meet this state assurance obligation funding requirement.

With regard to the NRC "reasonable assurance" finding required by Texas PUC Substantive Rule 25.304(h)(2): NINA 3 and NINA 4 must provide, among other things, "[c]onfirmation that the federal Nuclear Regulatory Commission either has made, or will make, a finding that there is reasonable assurance of the financial qualifications of the PGC, as required by federal regulations." There is some uncertainty regarding NINA's ability to meet this Texas requirement; NINA is pursuing an exemption to NRC's current "reasonable assurance" financial qualification requirements, and seeks to be qualified under the NRC's standard of "appears to be financially qualified," as directed by the Commission in its April 24, 2014, Staff Requirements Memorandum for SECY-13-0124, "Staff Requirements —SECY-13-0124—Policy Options for Merchant (Non-Electric Utility) Plant Financial Qualifications."[7]

Because of the several questions cited above, staff requested additional information from the applicant. Staff sought clarifying information about decommissioning fund cash sources cited in its application and its ability to meet Texas state assurance obligation and financial qualification requirements, and requested NINA to identify alternative approaches it would use to satisfy NRC's decommissioning funding requirements should NINA 3 and NINA 4 not meet the Texas nuclear decommissioning fund requirements.

In its August 4, 2015, response to the staff's Request for Additional Information (RAI) 01-27, 01-28, 01-29, and 01-30 (ML15222A125), NINA provided additional information regarding its plans to address decommissioning funding requirements. With regard to its ability to meet Texas state assurance obligation requirements, NINA explained that it will satisfy the state assurance obligation by depositing the required amount of funds in accordance with the prepayment method described in Texas PUC Substantive Rule 25.304(k)(1). It further clarified that, through the project financing structure proposed by NINA to fund Units 3 and 4, a cash amount referred to as "Decommissioning Fund Collateral" in the COL application, would be secured and used to address the state assurance obligation. NINA had also reported in its application, that it would provide annual sinking fund amounts "in the range of $12,000,000 per unit." This funding

[7] ADAMS Accession No. ML14114A358

amount would reasonably provide the necessary funding to meet the NRC's minimum decommissioning formula amount.

Based on information in its application and supplemented by its RAI responses, NINA's plan to satisfy the state assurance obligation requirements in Texas PUC Substantive Rule 25.304(k) and to make annual sinking fund payments is feasible. NINA appears able to adequately fund its annual decommissioning funding requirements based upon this plan, and has plans in place to satisfy Texas state assurance obligations. As previously discussed, decommissioning funding requirements in 10 CFR 50.75(a)(1) require an applicant to certify that it will provide, at a future date closer to the loading of fuel, actual proof both of financial assurance funding and of the financial instrument, or mechanism, to be used. However, at the time of application, no actual proof of funding or financial instrument is required.

NINA also provided information to address the issue of whether, in the eyes of the State of Texas, NINA 3 and NINA 4 would meet Texas PUC requirements that the NRC make a reasonable assurance finding of financial qualifications with regard to NINA 3 and NINA 4. NINA stated that it believes that the Texas PUC "…will have adequate foundation to conclude that…" all of its requirements will be met, inclusive of the "reasonable assurance" finding. Staff have not communicated with Texas PUC staff or commissioners to ascertain the likely outcome of future determinations by the State of Texas regarding "reasonable assurance" of financial qualifications for NINA 3 and NINA 4. Accordingly, staff concludes that there remains some uncertainty as to whether NINA 3 and NINA 4 would meet this Texas requirement, and hence, NINA 3 and NINA 4 may not be able to rely on the Texas nuclear decommissioning funding laws to justify use of the external sinking fund method.

To address this concern, NINA provided an alternative plan to provide decommissioning funding, should reliance on the State of Texas decommissioning law not be feasible at the time of funding. NINA indicated that NINA 3 and NINA 4 "…likely will use the 'prepayment' method of assurance set forth in 10 CFR 50.75(e)(1)(i)."

Per NINA,

> NINA 3 and NINA 4 would deposit an amount of cash in a nuclear trust fund for each unit, and each trust fund would be segregated from NINA's assets and outside the administrative control of NINA 3, NINA 4 and their affiliates. … [The] prepayment method would require an initial deposit of cash in the trust fund for each unit in the amount of approximately $236.6 million. The required cash for each unit would be generated through either loans or equity contributions, or a combination thereof, in the planned project financing. It is also possible that NINA may be able to use one of the other financial assurance methods authorized by 10 CFR 50.75(e).

NRC staff concluded that, should NINA be unable to meet the State of Texas requirements cited above, thus preventing NINA 3 and NINA 4 from relying on State of Texas nuclear decommissioning regulations to use the external sinking fund mechanism, NINA 3 and NINA 4 would qualify to use the prepayment method identified in 10 CFR 50.75(e)(1)(i). Moreover, the cash amount identified above would adequately fund the required prepayment sinking fund amount.

In summary, NINA has proposed meeting the decommissioning funding requirements using the “other mechanism, or combination of mechanisms” to provide assurance of decommissioning funding as allowed under 10 CFR 50.75(e)(1)(vi). NINA’s proposal relies on its meeting State of Texas decommissioning funding regulations and use of annual sinking fund contributions as cited above. Based on its analysis, this approach represents an acceptable decommissioning funding method assuming that NINA 3 and NINA 4 satisfy the Texas decommissioning funding regulations. Moreover, the annual funding amounts identified by NINA to meet the sinking fund requirements provide reasonable assurance for decommissioning based on the NRC’s minimum decommissioning formula.

Moreover, should NINA be unable to meet the State of Texas nuclear decommissioning funding regulations, it states that it would likely use the prepayment method as described in 10 CFR 50.75(e)(1)(i) to satisfy the NRC decommissioning funding mechanism requirements. Based upon NINA’s reliance on project finance and its assertion that such up-front funding would be generated from loans or equity contributions contemplated for the project finance funding model for STP Units 3 and 4, NRC staff concludes that it is feasible and reasonable that the applicant can assure the decommissioning funding amounts cited above ($236.6 million per unit). Staff further concludes that the initial funding amount of $236.6 million per unit as proposed by NINA does meet NRC prepayment financial requirements based upon a 40 year operating life, a 2% real rate of return, and growth in the fund during the 7 years following termination of operations as allowed for in NRC guidance. NINA’s identification of, and details regarding, NINA 3 and NINA 4’s use of the prepayment method should it be necessary, provides the applicant with another decommissioning funding mechanism by which NINA 3 and NINA 4 can assure decommissioning funding.

Therefore, the NRC staff concludes that the applicants have satisfied the decommissioning requirements for COL applicants by: (1) certifying that CPS Energy, NINA 3, and NINA 4 will provide financial assurance for decommissioning no later than 30 days after the Commission publishes notice in the Federal Register under § 52.103(a), in an amount which may be more, but not less, than the amount determined through 10 CFR 50.75(c); (2) accurately determining the amount required by 10 CFR 50.75(c); and (3) identifying acceptable and feasible decommissioning funding assurance methods under 10 CFR 50.75(e)(1). After the license is issued and as described above, 10 CFR 50.75(e)(3) requires the COL holders to provide actual proof of financial assurance for decommissioning before operation.

### 1.5S.2.3 Nuclear Insurance and Indemnity

For the purposes of nuclear insurance and indemnity, and consistent with the COL application, the applicants for STP Unit 3 are STPNOC, CPS Energy, NINA, and NINA 3 (hereafter, “the applicants for STP 3”). The applicants for STP Unit 4 are STPNOC, CPS Energy, NINA, and NINA 4 (hereafter, “the applicants for STP 4”). Effective January 24, 2011, NINA became the lead applicant with the overall responsibility for the COL application, including design and quality activities conducted before the issuance of the requested COLs.

The provisions of the Price-Anderson Act (Section 170 of the AEA) and the Commission's regulations in 10 CFR Part 140, "Financial Protection Requirements and Indemnity Agreements," require each holder of a license issued pursuant to 10 CFR Part 50, 10 CFR Part 52, or 10 CFR Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," to have and maintain nuclear energy liability insurance (also known as financial protection).

Specifically, as required by 10 CFR 140.11(a)(4), each licensee for a reactor designed to produce electrical energy and with a rated capacity of 100,000 kilowatts or more (hereafter, "large reactor") must have and maintain financial protection in an amount equal to the sum of primary financial protection ($375,000,000) and the amount available as secondary financial protection (in the form of private liability insurance) to satisfy the Price-Anderson requirements. The secondary financial protection consists of the licensees for large operating reactors paying a "deferred premium" to cover liability costs in excess of the amount of primary financial protection. This deferred premium is not paid until after the nuclear incident occurs, which is why NRC regulations require evidence that operating reactor licensees maintain a guarantee of payment of deferred premiums pursuant to 10 CFR 140.21, "Licensee guarantees of payment of deferred premiums." The primary and secondary financial protection required by 10 CFR 140.11(a)(4) would apply to STP Units 3 and 4 only upon the making of the 10 CFR 52.103(g) finding. However, under 10 CFR 140.13 "Amount of financial protection required of certain holders of construction permits and combined licenses under 10 CFR part 52," holders of COLs who also hold licenses under 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material," for possession and storage of reactor fuel must maintain $1,000,000 in financial protection until the 10 CFR 52.103(g) finding. Because this Part 70 license will be issued with the COL, STP Units 3 and 4 must have and maintain $1,000,000 in financial protection from issuance of the COL to the 10 CFR 52.103(g) finding. In consideration of this requirement and as the lead applicant for STP Units 3 and 4, NINA submitted a letter of intent on July 2, 2015, from the American Nuclear Insurers (ANI) documenting ANI's commitment to amend the nuclear liability insurance policy for STP Units 1 and 2 to include the primary financial protection coverage of $375,000,000 for STP 3 and 4 (ML15189A023). This coverage will be effective concurrent with the NRC's issuance of a COL to the applicants of STP Units 3 and 4. Therefore, the staff finds that the $375,000,000 coverage satisfies the $1,000,000 requirement in 10 CFR 140.13 and will satisfy the primary financial protection requirements in 10 CFR 140.11(a)(4).

Under the requirements in 10 CFR 140.11(a)(4) and 10 CFR 140.21, the NRC staff notes that coverage for secondary financial protection and the guarantee of deferred premium payments are only required for reactors authorized to load fuel and operate and therefore these will be deferred for STP Units 3 and 4 until the date of the 10 CFR 52.103(g) finding. This time period is consistent with the time period for operating licenses under 10 CFR Part 50, in which the 10 CFR 140.11(a)(4) requirements apply when an operating license has been granted. In consideration of the ANI's letter dated July 2, 2015, and the commitment to provide private liability insurance, the staff finds that the applicants for STP Units 3 and 4 will satisfy the requirements in 10 CFR 140.11(a)(4).

Although licensees for large reactors under Parts 50 and 52 must have and maintain secondary financial protection upon the NRC action authorizing operation, the timing provisions for reporting under 10 CFR 140.21 are not the same for Part 50 and 52 reactors because 10 CFR 140.21 does not specifically address the Part 52 process. To address this difference, NINA proposed in a letter dated August 10, 2015 (ML15225A200), a license condition to address the requirement in 10 CFR 140.21 for the guaranteed payment of deferred premiums. The staff finds the applicant's approach reasonable. Based on the NINA proposal, the staff will include the following license condition:

> Prior to the scheduled date of initial fuel load, and within ninety (90) days after the NRC publishes the notice of intended operation in the *Federal Register*, the licensees shall provide evidence to the Director of NRO, or the Director's designee, that they would have the ability to pay into the industry self-insurance program in the event of a nuclear incident and in the amount specified in 10 CFR 140.11(a)(4) for one calendar year using one of the following methods:
>
> (a) Surety bond,
>
> (b) Letter of credit,
>
> (c) Revolving credit/term loan arrangement,
>
> (d) Maintenance of escrow deposits of government securities, or
>
> (e) Annual certified financial statement showing either that a cash flow (i.e., cash available to a company after all operating expenses, taxes, interest charges, and dividends have been paid) can be generated and would be available for payment of retrospective premiums within three (3) months after submission of the statement, or a cash reserve or a combination of cash flow and cash reserve.

Thereafter, the licensees shall provide evidence of such guarantee in accordance with the provisions in 10 CFR 140.21.

With the license condition described above, the staff concludes that the STP Units 3 and 4 applicants will submit the evidence required by 10 CFR 140.21 for the guaranteed payment of deferred premiums in a timely fashion.

NRC has an indemnity agreement with the licensees of STP Units 1 and 2 and will amend the existing agreement to include STP Units 3 and 4 concurrent with the issuance of the COL.

Power reactor licensees are also required to maintain onsite property insurance per 10 CFR 50.54(w) after the 10 CFR 52.103(g) finding is made. Section 50.54(w) is a license condition with prescriptive requirements for the onsite property insurance to be obtained, and the COL application is not required to address the 10 CFR 50.54(w) requirements for onsite insurance. The staff will impose the following license condition to require the submission of documentation that 10 CFR 50.54(w) has been satisfied:

> Upon the date of initial fuel load, the licensees shall provide satisfactory documentary evidence to the Director of the Office of Nuclear Reactor Regulation or the Director's designee, that they have obtained the

appropriate amount of insurance required of licensees pursuant to 10 CFR 50.54(w).

With the license condition described above, the staff concludes that the applicants for STP Units 3 and 4 will timely provide documentary evidence that they satisfy the requirements of 10 CFR 50.54(w) for onsite insurance.

*Conclusion*

In consideration of the staff's evaluation and license conditions described above, the staff finds that the applicants for STP Units 3 and 4 have adequately addressed the provisions of the Price-Anderson Act (Section 170 of the AEA) and the applicable Commission regulations in 10 CFR Part 140. The provisions of 10 CFR 50.54(w) must be satisfied after the 10 CFR 52.103(g) finding is made, and the staff is including a license condition to require the timely submission of documentation that 10 CFR 50.54(w) has been met.

#### 1.5S.2.4 Antitrust

The Energy Policy Act of 2005 (EPAct) removed the antitrust review authority in Section 105c. of the AEA regarding license applications for production or utilization of facilities under Sections 103 or 104b. of the AEA that are submitted after the date of enactment of the EPAct. Accordingly, the NRC is not authorized to conduct an antitrust review in connection with this COL application.

### 1.5S.3 Nuclear Waste Policy Act

Section 302(b) of the *Nuclear Waste Policy Act* of 1982, as amended, requires, as a precondition to the issuance or renewal of a license to a person to use a utilization or production facility under Section 103 or Section 104 of the AEA [42 U.S.C. 2133, 2134], that the applicant for such license shall have entered into a contract under Section 302 with the Secretary or that the Secretary affirms in writing that the applicant is actively and in good faith negotiating with the Secretary for a contract under this section. The COL application did not contain information regarding a contract for the disposal of high-level radioactive waste.

NRC staff issued RAI 01-16 requesting the applicant to identify the Department of Energy (DOE) contract number applicable to STP Units 3 and 4 for the disposal of high-level radioactive waste and spent nuclear fuel. The applicant's response to RAI 01-16 dated December 8, 2009 (ML093450355), identifies the requested DOE contract numbers as DE-CR01-09RW09007 (for STP Unit 3) and DE-CR01-09RW09008 (for STP Unit 4). The staff found this response to be acceptable, and RAI 01-16 is resolved and closed. Accordingly, the staff concluded that the applicant has satisfied the requirements of Section 302(b) of the *Nuclear Waste Policy Act*.

### 1.5S.4 Consultation with Department of Homeland Security

In accordance with Section 657 of the Energy Policy Act of 2005, the NRC consulted with the Department of Homeland Security (DHS) with respect to STPNOC's COL application for the STP Units 3 and 4. Between January 30, 2008, and February 1, 2008, DHS conducted a site visit and was accompanied by NRC staff (ML080520367). On September 5, 2008, NRC issued the DHS consultation report regarding the DHS site visit with the applicant (ML082340558). The DHS report concludes that the applicant and the NRC staff have satisfied the requirements of Section 657 of the Energy Policy Act of 2005.

## 1.5S.5 Receipt, Possession, and Use of Source, Byproduct and Special Nuclear Material Authorized by 10 CFR Part 52 Combined Licenses

### 1.5S.5.1 Introduction

In Part 1 of Revision 12 of the COL application (ML15121A052), NINA and STPNOC requested other licenses that would be required to receive, possess, and use source, byproduct, and special nuclear materials (SNM) in connection with the construction and operation of Units 3 and 4. Such licenses would be granted in accordance with Commission regulations in 10 CFR Part 30, “Rules of General Applicability to Domestic Licensing of Byproduct Material”; Part 40, “Domestic Licensing of Source Material”; and Part 70 “Domestic Licensing of Special Nuclear Material.” The reviews conducted for compliance with the applicable requirements of 10 CFR Part 52 to support the issuance of the COLs encompass those requirements necessary to support granting 10 CFR Parts 30, 40, and 70 licenses. As a result, the 10 CFR Part 52 COLs for STP Units 3 and 4 will be consistent with the licensing requirements in 10 CFR Parts 30, 40, and 70 for nuclear power plant licenses in accordance with 10 CFR Part 50.

In SECY-00-0092, “Combined License Review Process,” dated April 20, 2000, the Commission approved generic license conditions for 10 CFR Parts 30, 40, and 70. In addition, per the memorandum dated December 9, 2008, from the Director of the Division of New Reactor Licensing in the Office of New Reactors (ADAMS Accession No. ML083030065); holders of a COL under 10 CFR Part 52 will also be authorized to receive, possess, and use source, byproduct, and SNM in accordance with Commission regulations in 10 CFR Parts 30, 40, and 70 including 10 CFR 30.33 and 40.32 of the same title, “General requirements for issuance of specific licenses,” 70.23, “Requirements for the approval of applications,” and 70.31, “Issuance of licenses,” under their 10 CFR Part 52 COL. Licensees will be required to comply with all applicable regulations in 10 CFR Parts 30, 40, and 70, as well as the regulations in 10 CFR Parts 20, “Standards for Protection Against Radiation,” 50, and 52.

In order to meet these requirements, the applicant needed to supplement the COL application with a request to receive, possess, and use source, byproduct, and SNM accordingly and provide sufficient information to support compliance with the applicable portions of 10 CFR Parts 30, 40, and 70. The staff reviewed this information and detailed the privileges to be granted under 10 CFR Parts 30, 40 and 70 licenses in the sections below.

### 1.5S.5.2 Parts 30, 40, and 70 License Requests

Pursuant to 10 CFR 52.8, “Combining licenses; elimination of repetition,” in Part 1, “General and Financial Information”, Section 1.1, “License Actions Required,” of the STP 3 and 4 COL application, NINA and STPNOC requested additional Parts 30, 40 and 70 licenses to be incorporated into the COL to receive, possess, and use source, special nuclear, and byproduct material in connection with the construction and operation of STP Units 3 and 4. Specific information regarding the types and quantities of the byproduct, source, and special nuclear material requested by the applicant and the applicant's limitations on certain types of material can be found in Part 1, Section 1.1 of the COL application.

### 1.5S.5.3 Parts 30, 40, 70 License Request Clarifications

In order to support the staff's review of the sources required for construction and operation, the staff issued RAI 12.02-6 on July 9, 2009 (ML091900764). In this RAI, the staff requested the applicant to describe any required radiation sources greater than 3.7E+9 becquerels (100 millicuries) as discussed in RG 1.206, Regulatory Position C.I.12.2.1. The applicant's response, dated August 20, 2009 (ML092360170) stated that the application incorporates by reference Subsection 12.2.1.2.9 of the certified ABWR DCD with no additional sources. The staff determined that the response did not reference or include information on calibration sources as expected. The RAI was unresolved pending a follow-up RAI.

On November 19, 2009, the staff issued follow-up RAI 12.02-13 (ML093230686), which requested the applicant to provide the required information regarding any planned sources for radiation detection instrumentation calibration that would exceed 3.7E+9 becquerels (100 millicuries). The applicant was also instructed to revise the FSAR to include this information. In the response dated December 21, 2009 (ML093580194), STPNOC stated that it had not yet determined any need for calibration sources exceeding the stated threshold and had therefore not mentioned any in the FSAR or as part of the license request. The applicant further stated that calibration of general dosimetry and portable radiation monitoring equipment would be performed by the Metrology Laboratory for STP Units 1 and 2. The response also stated that large sources used for radiography at STP Units 3 and 4 will be under a license granted "to" (which was later corrected to "by" in COL application Revision 11) the State of Texas. The response referenced the response to RAI 01-15 for additional details regarding the applicant's radiation protection (RP) Program (see RAI 01-15 discussion below). In order to resolve the RAI, the applicant revised the FSAR by adding Subsection 12.2.1.2.9.6, "Other Contained Sources," to clarify the information in this RAI response. The staff found the response acceptable and confirmed that this information is incorporated into Revision 4 of the FSAR. The RAI is resolved and closed.

In order to support the staff's review of the additional 10 CFR Parts 30, 40 and 70 license requests, the staff issued RAI 01-15 on November 16, 2009 (ML093200367). In this RAI, the staff acknowledged that the additional license requests specified above would be in accordance with Commission regulations in 10 CFR Parts 30, 40, and 70. The staff thus requested the applicant to (1) determine whether the proposed standard license conditions outlined in the RAI for 10 CFR Parts 30, 40, and 70 are appropriate for the STP Units 3 and 4 COL application; and (2) address program elements ensuring that the applicant will have in place the necessary controls to allow the receipt of byproduct and source materials before the 10 CFR 52.103(g) finding.

In the applicant's response RAI 01-15 dated December 8, 2009 (ML093450355), the applicant agreed that the proposed 10 CFR Parts 30, 40, and 70 license conditions were appropriate; with a modification to allow STP Units 3 and 4 to possess but not separate such byproduct and SNM as may be produced by the operation of the facility (STP Units 3 and 4) or any of the other units at the STP site. This modification would enable Unit 3, for example, to take low-level waste (LLW) or contaminated tools from Unit 1. The response provided additional information identifying where and how the FSAR demonstrated compliance with the regulations.  The full sets of applicable license conditions in Parts 30, 40, and 70 proposed by the staff for STP Units 3 and 4 are listed below in Subsection 1.5S.5.6, “Parts 30, 40, and 70 License Conditions.”  The staff finds this information acceptable, and RAI 01-15 is resolved.

In a letter dated April 6, 2011 (ML110980614), the applicant withdrew the requests for licenses under 10 CFR Parts 30 and 40.  The applicant stated that this was necessary based on the inability to determine quantities and source forms of the radioactive materials required at the time.  The letter included revisions to the COL application in Part 1 Section 1.1, “License Actions Requested.”  These revisions, in a slightly different form, appeared in COL application Revision 6 submitted in August 2011, which showed the words “…Parts 30, 40, and 70…” were modified to “…Part 70 (including Reporting Criteria of 10 CFR 70)…”

On August 18, 2014, the staff issued RAI 01-26 (ML14226A989), which provided the regulatory background and clarifying information regarding the necessity of a COL licensee to also be licensed to possess and use material that will be needed to construct and operate the reactor.  This RAI requested the applicant to update Part 1 Section 1.1 of the COL application to restore the requests for licenses under 10 CFR Parts 30 and 40, as well as to supply additional information regarding the potential for possessing radioactive material under Parts 30 and 40.  The RAI requested the applicant to clarify the specific types of byproduct material/sources (Part 30), source material (Part 40), and SNM (Part 70); the chemical or physical forms; and the maximum amount at any one time of the requested material licenses under 10 CFR Parts 30, 40, and 70.  The RAI included a table summarizing the types of information required to be submitted and the applicable guidance for the requested information.

In the response to RAI 01-26 dated September 24, 2014 (ML14272A155), NINA provided the requested additional information and planned revision to the COL application to restore Parts 30 and 40 license requests.  However, the response incorrectly referenced 10 CFR 50.75(c) rather than 10 CFR 30.35, “Financial assurance and recordkeeping for decommissioning,” when discussing financial assurance and recordkeeping for decommissioning related to radioactive material possessed under 10 CFR Part 30 and before a Commission finding under 10 CFR 52.103(g).  Two other errors were also identified —a curie content limit and the atomic number range.  The corrections were discussed in a conference call on September 30, 2014 (see meeting summary in ML14275A080), and NINA agreed to correct the RAI response.

The staff also had a question concerning when and how NINA would apply the emergency plan (EP) and security program if in possession of quantities in excess of the applicable Parts 30,40, and 70 thresholds triggering such programs.  The applicant confirmed a commitment to establish the EP and security programs when required by applicable regulations, so as to ensure that coverage for such materials would always be in effect.  The applicant referenced the response to RAI 01-15 and FSAR Chapter 13, “Conduct of Operations.”  The applicant agreed to add additional statements in the COL application clarifying and agreeing not to possess certain materials before the implementation of the EP.  A revised response to RAI 01-26 was submitted on October 1, 2014 (ML14280A541).  This response did not include the wording stating that the applicant would not receive, possess, or use certain materials before the implementation of the EP.

The final corrected response to RAI 01-26 dated October 9, 2014 (ML14294A463), provided the additional wording and planned revision to the COL application to restore the Parts 30 and 40 license requests. However, during the review of the final response, the staff noted that all of the proposed revisions would be in Part 1 of the COL application and not in the FSAR. Once the COL was issued, there would be no need to maintain Part 1. Commitments not in the FSAR would be unenforceable once the COL was issued. The staff considered requesting NINA to move some of the additional wording to either Chapter 1, "Introduction," or Chapter 12, "Radiation Protection," of the FSAR. The basis for moving these revisions was discussed in a conference call on October 14, 2014, (meeting summary ML14288A161). During the call, the staff agreed that the proposed revisions could remain in Part 1, but the staff would ensure that license conditions LC-1-1 and LC-1-2 would be included in the COL when issued. The staff confirmed that the proposed revisions to the application were incorporated into Revision 11 of the application, including corrections to the errors in the responses to RAI 01-26 and references to 10 CFR 30.72, "Schedule C–Quantities of radioactive materials requiring consideration of the need for an emergency plan for responding to a release," that were discussed in the September 24, 2015, meeting.

#### 1.5S.5.4 Exemptions from Part 70 License Request

In a letter dated October 27, 2011 (ML11307A239), the applicant requested an exemption from the requirements of 10 CFR 70.22(b), 70.32(c), 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." The applicant provided a full explanation for the exemption request and a description of the Material Control and Accounting (MC&A) Program to be used if the exemption is granted. A license granted under Part 70 to possess SNM requires an MC&A Program, which is identified in the FSAR, Tier 2 Chapter 13, "Conduct of Operations," Subsection 13.5.3.4.1, "Administrative Procedures"; and listed in 13.4S-1, "Operational Programs Required by NRC Regulation and Program Implementation," Item 21. The existence and acceptability of an MC&A Program is assumed in the evaluation of the Part 70 license request, with the actual review of the MC&A Program (and the exemption request) in Section 1.11S.3 of this SER.

#### 1.5S.5.5 Parts 30, 40, and 70 Materials and Use Clarifications

See Subsection 1.5S.5.3 above for details regarding the RAIs issued and responses submitted with respect to the receipt, possession and use of materials under Parts 30, 40, and 70.

<u>10 CFR Part 30 Materials</u>

With respect to the amount of Part 30 materials specified by the applicant between the issuance of the COL and before the 10 CFR 52.103(g) finding, the applicant stated in Revision 11 of the application (Part 1, Section 1.1) that the quantity of any sealed calibration and referenced sources of byproduct material with the atomic numbers 1 through 95 would not exceed 100 millicuries for a single source and would not exceed 5 curies total. The applicant also specified five californium startup sources with 0.749 mg per source (0.40 curies) for a total of 3.745 mg (2.01 curies). The applicant stated that this information includes calibration and reference sources.

Additionally, the applicant stated that no byproduct material will be received, possessed, or used in a physical form that is "in unsealed form, on foils or plated sources, or sealed in glass," that exceeds the quantities in Schedule C in 10 CFR 30.72, "Schedule C – Quantities of radioactive materials requiring consideration of the need for an emergency plan for responding to a release." Further clarifications of the licensing for the receipt, possession, and use of Part 30 materials are outlined below in Subsection 1.5S.5.6, "Parts 30, 40, and 70 License Conditions."

<u>10 CFR Part 40 Materials</u>

The applicant stated that no 10 CFR Part 40 specifically licensed material—including natural uranium, depleted uranium, and uranium hexafluoride—will be received, possessed, or used during the period between the issuance of the COL and the 10 CFR 52.103(g) finding. Accordingly, the license conditions described below apply only to the handling of Parts 30 and 70 materials between the issuance of the COL and the 10 CFR 52.103(g) finding. Further clarifications of the licensing for the receipt, possession, and use of Part 40 materials after a 10 CFR 52.103(g) finding are also outlined below in Subsection 1.5S.5.6, "Parts 30, 40, and 70 License Conditions."

<u>10 CFR Part 70 Special Nuclear Material (non-fuel)</u>

To specify these materials, the applicant stated that the radioactive materials identified in the table below represent nominal values of known non-fuel SNM specifically required for use in STP Units 3 and 4 fission chambers.

Table 1.5S-1 Non-Fuel Special Nuclear Material for Use

| **Element and Mass Number** | **Chemical or Physical Form** | **Amount** |
|---|---|---|
| Uranium-234 and -235 in Start-up Range Neutron Monitor (SRNM) | Uranium oxide in SRNM detector-fission chamber | Approximately 5.6 mg of UO2 (U-235:U-234 = 1:4) per SRNM detector assembly |
| Uranium-234 and -235 in the Local Power Range Monitor (LPRM) | Uranium oxide in LPRM detector-fission chamber | Approximately 13 mg of UO2 (U-235:U-234 = 1:4) per LPRM detector assembly,<br><br>52 LPRM detector assemblies – Total amount = approximately 676 mg. |
| Uranium-235 in the Traversing In-core Probe (TIP) detector | Uranium oxide in TIP detector – fission chamber | Approximately 1 mg of the UO2 per TIP detector<br><br>3 TIP detectors - Total amount = approximately 3 mg. |

The above information is in the COL application Part 1, Section 1.1. Additional clarifications of licensing for the receipt, possession, and use of Part 70 materials as a non-fuel are outlined below in Subsection 1.5S.5.6, "Parts 30, 40, and 70 License Conditions."

<u>10 CFR Part 70 Special Nuclear Material (Fuel)</u>

The receipt, possession, and use of Part 70 SNM as fuel are fully described in the applicant's FSAR in accordance with the limitations for storage and in the amounts necessary for reactor operation, as supplemented and amended. Additional clarifications of licensing for the receipt, possession, and use of Part 70 materials as fuel are outlined below in the license conditions. The applicant has been advised that although all design, erection, and training activities associated with the development of a 10 CFR 73.55 program may proceed during construction, the program is not considered operational until the 10 CFR 52.103(g) finding, which allows fuel load, has been made by the Commission. Therefore, since the applicant has not presented a separate 10 CFR 73.67 security plan for the possession of fuel onsite prior to the 10 CFR 52.103(g) finding, the applicant will not be allowed to possess reactor fuel until after the 10 CFR 52.103(g) finding, when its 10 CFR 73.55 security program is operational.

### 1.5S.5.6 Parts 30, 40, and 70 License Conditions

Based on the discussions above and the reviews outlined below, the staff proposes to include the following license conditions for the STP Units 3 and 4 COL as they relate to authorization pursuant to the regulations in 10 CFR Parts 30, 40, and 70. The "Act" refers to the Atomic Energy Act of 1954, as amended.

- License Condition (1-1) – Subject to the conditions and requirements incorporated herein, the Commission hereby licenses NINA/STPNOC:

  (a) NINA, pursuant to the Act and 10 CFR Parts 30 and 70, to receive, possess, and use, at any time before a Commission finding under 10 CFR 52.103(g), such byproduct and special nuclear material (but not uranium hexafluoride) as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts not exceeding those specified in 10 CFR 30.35(d) and 10 CFR 70.25(d) for establishing decommissioning financial assurance, and not exceeding those specified in 10 CFR 30.72 and 10 CFR 70.22(i)(1);

  (b) STPNOC, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use, after a Commission finding under 10 CFR 52.103(g), any byproduct, source, and special nuclear material (but not uranium hexafluoride) as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts, as necessary;

  (c) NINA, pursuant to the Act and 10 CFR Parts 30 and 70, to receive, possess, and use, before a Commission finding under 10 CFR 52.103(g), any byproduct or special nuclear material (but not uranium hexafluoride) that is (1) in unsealed form, (2) on foils or plated surfaces, or (3) sealed in glass, for sample analysis or instrument calibration or other activity associated with radioactive apparatus or components, in amounts not exceeding those specified in 10 CFR 30.35(d) and 10 CFR 70.25(d) for establishing decommissioning financial assurance, and not exceeding those specified in 10 CFR 30.72 and 10 CFR 70.22(i)(1);

  (d) STPNOC, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use, after a Commission finding under 10 CFR 52.103(g), in amounts as necessary, any byproduct, source, or special nuclear material (but not uranium hexafluoride) without restriction as to chemical or physical form, for sample analysis or instrument calibration or other activity associated with radioactive apparatus or components;

- License Condition (1-2) – Before the initial receipt of SNM onsite, the licensee shall implement the SNM Material Control and Accounting Program. No later than 12 months after issuance of the COL, the licensee shall submit to the Director of NRO a schedule that supports planning for and conduct of NRC inspections of the SNM Material Control and Accounting Program. The schedule shall be updated every 6 months until 12 months before scheduled fuel loading, and every month thereafter until the SNM Material Control and Accounting Program has been fully implemented.

- License Condition (1-3) – NINA shall implement the fire protection measures for designated storage building areas (including adjacent fire areas that could affect the storage area) before initial receipt of byproduct or SNMs that are not fuel (excluding exempt quantities as described in 10 CFR 30.18).

- License Condition (1-4) – STPNOC shall implement the fire protection measures for new fuel storage areas (including all adjacent fire areas that could affect the new fuel storage area) before receipt of fuel onsite.

- License Condition (1-5) – Prior to the receipt of fuel onsite, a formal letter of agreement shall be in place with the local fire department specifying the nature of arrangements in support of the Fire Protection Program.

- License Condition (1-6) – All Fire Protection Program features shall be implemented before initial fuel load.

- License Condition (1-7) – Three months before fuel is transported onsite (protected area), the transportation Physical Security Plan shall be implemented.

- License Condition (1-8) – In the first required update of the FSAR in accordance with 10 CFR 50.71(e), FSAR Section 13.6.4, "Transportation Physical Security Plan," shall be updated to include requirements to inspect the integrity of the fuel's containers and tamper seals upon receipt of shipments of nuclear power reactor fuel and to notify the shipper of receipt of the material in accordance with 10 CFR 74.15, "Nuclear material transaction reports".

#### 1.5S.5.7 Operational Programs to Support 10 CFR Parts 30, 40, and 70

The staff notes that STP Units 3 and 4 COL application FSAR Table 13.4S-1, "Operational Programs Required by NRC Regulations and Program Implementation," provides milestones and commitments for the implementation of various operational programs. Important milestones for the portions of operational programs applicable to radioactive materials that support the issuance of licenses and requirements relative to 10 CFR Parts 30, 40, and 70 are included in the following programs:

- Item 8: Fire Protection Program

- Item 10: Radiation Protection Program

- Item 11: Non-Licensed Plant Staff Training Program

- Item 14: Emergency Planning

- Item 15: Security Program [all programs related to security]

- Item 21: SNM Material and Accounting Program

#### 1.5S.5.8 Part 70 License Staff Review

The applicant's compliance with several applicable 10 CFR Part 70 requirements regarding radiation protection, nuclear criticality safety, and environmental protection are already encompassed by the design information incorporated by reference from the ABWR DCD. Other applicable 10 CFR Part 70 requirements to be addressed by the COL applicant are outlined below. In order to satisfy NRC regulations and requirements for licensing under 10 CFR Part 70 so as to receive, possess, and use SNM as fuel and non-fuel, the applicant addressed the following areas for review per the guidance in NUREG–1520 and NUREG–0800:

- General Information – Applicant identification, location, licenses sought, financial qualifications, exemption requests, site layout, population, geography, nearby facilities, meteorology, hydrology, geology, and seismicity
- Organization and Administration – Structure, management, functions, qualifications, experience, communications, and turnover of the construction to operation
- Radiation Protection
- Criticality Safety
- Fire Safety
- Emergency Preparedness
- Environmental Protection
- SNM Material Control & Accounting Review (Exemptions, MC&A, and Fixed Site Security)
- Physical Protection Program

<u>General Information</u>

The legal identities of the applicant and the site location are described in Part 1, Section 1. The license action types requested by the applicant are described in Part 1, Section 1.1. However, the staff has further clarified the 10 CFR Parts 30, 40, and 70 licenses to be granted in the license conditions listed above and throughout this review. Financial qualifications are in Part 1, Section 1.3, "Financial Qualifications," which the staff reviewed in SER Sections 1.5S.2.1 and 1.11S.5. The exemption requests for Part 70 licensing were submitted on October 27, 2011 (ML11307A239), which the staff reviewed in Section 1.5S.4 of this SER. The facility layout, property boundaries, geography, and population are described in FSAR Section 2.1. Locations of nearby facilities are described in FSAR Section 2.2. Meteorology is described in FSAR Section 2.3, and site hydrology is described in FSAR Section 2.4. Site geology and seismicity are described in FSAR Section 2.5. Based on the above information, the staff finds that the applicant has satisfactorily addressed general information.

<u>Organization and Administration</u>

The applicant's organizational structure and charts are in FSAR Section 13.1, "Organization Structure of Applicant." This information includes functional descriptions of the organizational groups—including those responsible for managing the design, construction, operations, and modifications of the facility; in addition to responsibilities, reporting hierarchy, and communications. FSAR Section 13.1.3 discusses the qualifications requirements for STP plant personnel. Based on the above information, the staff finds that the applicant has satisfactorily addressed organizational information.

Radiation Protection

The staff's safety review under 10 CFR Part 52 for radiation protection (RP) programs and systems for the construction and operation of STP Units 3 and 4 is in SER Chapter 12. The staff finds the applicant's RP programs and systems acceptable for construction and operation.

In FSAR Table 13.4S-1, "Operational Programs Required by NRC Regulation and Program Implementation," Item 10, the applicant states that the RP Program at STP Units 3 and 4 will be implemented in the following milestones:

- Initial receipt of byproduct, source, or SNM (excluding exempt quantities described in 10 CFR 30.18)
- Receipt of fuel on site
- Fuel load
- First shipment of radioactive waste

Implementation of the RP Program according to the milestones described above is set forth in license condition under Chapter 12. This corresponds to the four milestones for the RP Program that are specified in Nuclear Energy Institute (NEI) Template 07-03A, "Generic FSAR Template Guidance for Radiation Protection Program Description, Revision 0." NEI 07-03A is incorporated by reference in Chapter 12, Section 12.05S, of the STP Units 3 and 4 FSAR. By letter dated March 18, 2009 (ML090510379), the staff determined that NEI 07-03 provides an acceptable template for assuring that the RP Program meets the applicable NRC regulations and guidance. Therefore, the staff finds these commitments acceptable.

The staff also performed additional RP reviews for the 10 CFR Part 70 license. The regulatory basis for the RP Program applicable to the receipt and storage of new fuel assemblies before the commencement of reactor operation is in 10 CFR Parts 19, 20, and 70. The purpose of this review is to determine whether the proposed STP Units 3 and 4 RP Program is adequate to protect the radiological health and safety of workers, the public, and the environment during new fuel handling and storage operations under 10 CFR Part 70.

The applicable acceptance criteria for the staff's Part 70 review of the STP Units 3 and 4 RP Program are in Section 4.4 of NUREG–1520 Revision 1, "Standard Review Plan for the Review of a License Application for a Fuel Cycle Facility." Although some portions of the acceptance criteria in Section 4.4 of NUREG–1520 are relevant to this incremental review, other portions are not. For example, certain RGs and other documents referenced in Section 4.4 of NUREG–1520 are specific to fuel cycle facilities and are not applicable to reactor reviews. Also, reactors are not one of the engagements requiring an integrated safety analysis per 10 CFR 70.60.

Operations pertaining to Part 70 include uncrating and inspecting fuel assemblies and storing them in the spent fuel storage pool before loading them into the reactor. As the fuel assemblies are effectively contained/sealed material with little associated external radiation, the radiological risks associated with this operation are considered minimal.

In general, the NUREG–1520 acceptance criteria require descriptions to ensure that the following topics will be adequately addressed at the facility: RP Program implementation; radiation exposures as low as reasonably achievable (ALARA); RP organization and qualifications; written procedures; training; ventilation and respiratory protection programs; radiation survey and monitoring programs; radiological risks associated with accidents; and additional programs that normally impact the RP functions. In the applicant's FSAR, Section 12.5S describes the operational RP Program. The program incorporates by reference NEI Template 07-03A (ML091490684), with site-specific supplements or substitutions included elsewhere in the FSAR as the operational RP Program description. NEI 07-03A is the final accepted version of the NRC-reviewed NEI-07-03, Revision 7 (ML083380347). Table 13.4S-1 in the applicant's FSAR indicates that all necessary aspects of the STP Units 3 and 4 RP Program will be implemented before the receipt of any byproduct, source, SNM (except as described in 10 CFR 30.18), or fuel.

The generic RP Program template commits an applicant to NRC regulatory requirements and guidance; the acceptance criteria listed in RG 1.206; and Section 12.5 of NUREG–0800. Although NUREG–0800 is not as prescriptive regarding the required information for an RP Program as NUREG–1520 is, the staff understands that a program established to address Part 52 operations will adequately address Part 70 operations as well. The staff reviewed NEI 07-03A and the modifications and supplements to that information described in the FSAR. The staff finds that the information adequately addresses the topics evaluated in Section 4 of the NUREG–1520 with the exceptions of ALARA, ventilation, and radiological risks associated with accidents.

With respect to ALARA, the applicant states in Section 12.5S of the FSAR that NEI 07-08A (ML093220178), "Generic FSAR Template Guidance for Ensuring That Occupational Radiation Exposures are As Low As Is Reasonably Achievable (ALARA), Revision 0," is incorporated with modifications or supplements as noted in the aforementioned appendices. Similar to NEI 07-03A, NRC staff previously reviewed NEI 07-08 Revision 3 and found it acceptable as documented via a letter dated October 15, 2009 (ML091130034). The template, in conjunction with template NEI 07-03A, generally describes operational policies; regulatory compliance; and operational considerations applicable to the ALARA Program. Compliance with the template, when considering the minimal risks associated with the storage and handling of new fuel under Part 70, is adequate to ensure that operations will be ALARA. The applicant's RP Program to achieve occupational doses ALARA also addresses regulatory requirements for RP found in 10 CFR Part 20.

Regarding ventilation, as mentioned previously, the materials of interest for this license are expected to be contained and pose little airborne potential for or risk of internal exposure. For this reason, the staff did not find it necessary to evaluate the facility's ventilation systems.

The Integrated Safety Analysis requirements for controlling the radiological risks discussed in Section 4.4.8 of NUREG–1520 are not applicable to STP Units 3 and 4, because the proposed operations are excluded from the list of activities defined in 10 CFR 70.60, "Applicability," to which 10 CFR Part 70, Subpart H applies. The applicant did submit an EP (Part 5 of the application) that addresses responses to accident situations involving potential radiological exposures. As stated previously, the expectation is that the unirradiated uranium contained in the fuel will pose little radiological risk to the operations under Part 70.

The staff finds that STPNOC will establish and maintain an acceptable RP Program for STP Units 3 and 4, which addresses operations under 10 CFR Part 70 and includes the following:

- An effective documented program to ensure that occupational radiological exposures are ALARA.
- An organization with adequate qualification requirements for RP personnel.
- Approved and written RP procedures and radiation work permits for RP activities.
- RP training for all personnel who have access to restricted areas.
- A program to control airborne concentrations of radioactive material with engineering controls and respiratory protections.
- A radiation survey and monitoring program that includes requirements for controlling radiological contamination within the facility; and requirements for monitoring external and internal radiation exposures.
- Other programs to correct upsets at the facility, maintain records, and generate reports in accordance with 10 CFR Parts 20 and 70.

The staff concludes that the applicant's RP Program for STP Units 3 and 4—with respect to the initial new fuel elements for the first reactor core as described in its License Application—complies with regulatory requirements in 10 CFR Parts 19, 20, and 70; and adequately addresses the applicable acceptance criteria in Section 4.4 of NUREG–1520, Revision 1. The staff finds that the applicant's RP Program for STP Units 3 and 4 is therefore acceptable.

Criticality Safety

With respect to additional nuclear criticality safety reviews of 10 CFR Part 70 licenses, the staff conducted the following review. The regulatory basis for the review of STP Units 3 and 4 nuclear criticality safety (NCS) is in 10 CFR 70.22, "Contents of applications"; 10 CFR 70.23, "Requirements for the approval of applications"; 10 CFR 70.24, "Criticality accident requirements"; and 10 CFR 70.52, "Reports of accidental criticality." The purpose of this review is to determine whether the STP Units 3 and 4 proposed NCS Program is adequate to protect the radiological health and safety of workers, the public, and the environment during new fuel handling and storage operations under 10 CFR Part 70. The applicable acceptance criteria for the staff's Part 70 review of the STP Units 3 and 4 NCS Program are in Section 5.4 of NUREG–1520. However, the staff determined that few of those acceptance criteria are applicable to the proposed STP Units 3 and 4 Part 70 operations. The staff therefore limited the review to what was necessary to assure compliance with the applicable 10 CFR Part 70 requirements noted previously.

NINA submitted a combined construction permit and operating license application for two new ABWRs designated as STP Units 3 and 4. This review focused on criticality safety of the receipt, possession, inspection, and storage of SNM in the form of new fuel assemblies applicable under 10 CFR Part 70. The operations relevant to the Part 70 portion of the license include uncrating and inspecting the fuel assemblies and storing them in the spent fuel storage pool before loading into the reactor (STP Units 3 and 4 will not use the new fuel storage vault as described in Tier 1 departure, STP DEP T1 2.5-1, in Part 7 of the application). FSAR Section 9.1, “Fuel Storage and Handling,” discusses criticality safety of new and spent fuel storage and handling.

The staff reviewed the criticality safety summaries, evaluations, and conclusions in ABWR FSER (NUREG–1503, ML080670592) Sections 9.1.1, and 9.1.2 as well as the same sections of the Advanced Safety Evaluation for the South Texas Project, Units 3 and 4 application. These sections present the staff’s criticality safety reviews of the ABWR fuel storage and handling capabilities for new fuel and spent fuel. Included in the evaluation were seismic considerations, dropped loads, and fuel placement outside of the designated storage locations, as well as the evaluations required to be compliant with 10 CFR 50.68, “Criticality accident requirements.” The evaluations presented encompass criticality safety considerations for new fuel handling and storage under Part 70. Based on the staff’s review of the applicant’s results demonstrating a substantial margin for the regulatory limits, the staff concluded that the acceptance criteria described in General Design Criterion (GDC) 62, “Prevention of criticality in fuel storage and handling,” and 10 CFR 50.68(b) are satisfied. The staff’s general conclusion is that subcriticality will be assured during new fuel handling and storage operations because the applicant meets GDC 62, as it relates to the prevention of criticality by physical systems or processes using geometrically safe configurations that will be compliant with 10 CFR 50.68.

Sections 9.1.1 and 9.1.2 of NUREG–1503 include statements that either verify or satisfy compliance with regulatory requirements under 10 CFR 50.68. This is also adequate for Part 70 operations.

In response to RAI 12.03-12.04-15 dated February 25, 2010 (ML100610277), the applicant stated that in lieu of demonstrating compliance with 10 CFR 70.24, STP Units 3 and 4 will comply with the requirements of 10 CFR 50.68(b), as allowed by 10 CFR 70.24(d)(1) and 10 CFR 50.68(a). As such, the staff concludes that the requirements of 10 CFR 70.24 regarding criticality accident alarms will not apply. In accordance with 10 CFR 50.68(b)(6), radiation monitors will be provided in the storage and associated handling areas when fuel is present.

Finally, the staff determined that reporting compliant with 10 CFR 70.52 would be self-evident because the licensee will comply with 10 CFR 50.68 and 10 CFR 50.72; and no elaboration in the application should be required to assure compliance with those regulations.

The staff reviewed the applicant’s information ensuring that the applicant’s equipment, facilities, and procedures will be adequate to assure subcriticality of the new fuel consistent with 10 CFR 70.23(a)(3) and (4), thus adequately protecting health and minimizing danger to life or property.

Fire Safety

The staff’s safety review under 10 CFR Part 52 for the fire protection programs and systems for the licensing and operation of STP Units 3 and 4 was completed and is in

Section 9.5.1 of this SER. In FSAR Table 13.4S-1 Item 8, a license condition requires the applicant to (1) implement the Fire Protection Program pertaining to new fuel storage before fuel receipt onsite; and (2) implement the Fire Protection Program before fuel load. These requirements provide reasonable assurance that adequate fire protection will be provided and maintained to meet the criteria of 10 CFR 70.23.

With respect to the fire safety review of 10 CFR Part 70 licenses, the staff performed the following review using the applicable guidance in NUREG–1520 Revision 1 and National Fire Protection Association (NFPA) code NFPA 801, "Standard for Fire Protection for Facilities Handling Radioactive Materials."

The purpose of this review is to determine, with reasonable assurance, that STP Units 3 and 4, has (1) designed a facility that provides adequate protection against fires and explosions that could affect the safety of licensed materials and thus present an increased radiological risk; (2) considered the radiological consequences of fires; and (3) instituted suitable safety controls to protect workers, the public, and the environment.

The regulatory basis for the fire safety review includes the general and additional contents of the application, as required by 10 CFR 70.22. In addition, the fire safety review must provide reasonable assurance of compliance with 10 CFR 70.23(a)(3) and 10 CFR 70.23(a)(4). The acceptance criteria that the NRC uses for reviewing the fire safety of licensed materials are outlined in Subsections 7.4.3.1 through 7.4.3.5 of NUREG–1520, Revision 1. The fire protection review was performed relative to the guidance in NUREG–1520.

The information to support this review was obtained from Revision 12 of the COL application submitted by NINA for the construction and operation of two nuclear power generating plants designated as STP Units 3 and 4 and dated April 21, 2015 (ML15124A421). The facility and its original fire protection systems will be designed and constructed to industrial standards identified in DCD Section 9.5.1 and modified by FSAR Section 9.5.1. The applicant commits to meeting the prevailing codes whenever facilities are expanded or modified. Facilities are generally noncombustible masonry or metal construction. Lightning protection is incorporated into the facility design. Fire exit routes will be clearly marked for each fire area. These routes will be designed to comply with applicable life safety codes and standards.

Within the Reactor Building (RB), which is a seismic Category I structure, new fuel bundles are brought in by transport truck via the large Component Entrance Building; unloaded by crane through the RB entry hatch; inspected on the refueling floor; and transferred to the spent fuel pool. The process itself utilizes methods and materials that have no fire safety concerns. The fire protection equipment in the fuel handling area of the RB includes fire detection, portable fire extinguishers, and hose stations for manual firefighting.

Site procedures for the maintenance and surveillance testing of the equipment listed above including the fire pump, fire mains, standpipes, and hoses will be developed and performed as described in the Fire Protection Program. In addition, compensatory measures may be implemented as an interim step to restore operability until final corrective action is complete, if any of the listed fire equipment becomes unavailable. The COL applicant stated that such compensatory measures will be described in the Fire Protection Program and will meet the guidance in RG 1.189.

The staff proposed the following license conditions regarding the Fire Protection Program:

1. NINA shall implement the fire protection measures for designated storage building areas (including adjacent fire areas that could affect the storage area) before initial receipt of byproduct or SNMs that are not fuel (excluding exempt quantities as described in 10 CFR 30.18).

2. STPNOC shall implement the fire protection measures for new fuel storage areas (including all adjacent fire areas that could affect the new fuel storage area) before receipt of fuel onsite.

3. Prior to the receipt of fuel onsite, a formal letter of agreement shall be in place with the local fire department specifying the nature of arrangements in support of the Fire Protection Program.

4. All Fire Protection Program features shall be implemented before initial fuel load.

These license conditions are included in Part 30, 40, and 70 License Conditions section in Subsection 1.5S.5.6 of this SER.

Effective handling of fire emergencies is accomplished by trained and qualified emergency responders. The fire response organization is staffed and equipped for firefighting activities. The fire brigade is composed of a fire brigade leader and four fire brigade members. The fire brigade does not include the Shift Manager or other members of the minimum shift crew necessary for a safe shutdown of the unit, nor any personnel required for other essential functions during a fire emergency. Additional support is available when needed through an agreement with the local fire department. Training ensures that the capability of fire brigades to combat fires is established and maintained. The training program consists of initial (classroom and practical) training and recurrent training that includes periodic instruction, fire drills, and annual fire brigade training.

Firefighting equipment is provided throughout the plant. Fire emergency procedures and pre-fire plans specify actions to be taken by the individual discovering the fire and by the emergency response organization. The COL applicant stated that a specific pre-fire plan, representative of as-built conditions, will be prepared for the fuel receipt area and the fuel storage area. Discussion of this pre-fire plan is included in the periodic classroom instruction training program provided to the emergency response team. Combustibles are controlled to reduce the severity of a fire that might occur in a given area and to minimize the amount and type of material available for combustion. The use and application of combustible materials at STP Units 3 and 4 are controlled with the following methods:

- instructions/guidelines provided during general employee training
- periodic plant housekeeping inspections/tours by management and/or the fire protection organization for the plant
- the design/modification review and installation process
- administrative procedures (e.g., Transient Combustible Control Program)

- the Fire Hazards Analysis (FHA)

- use of industry standards and codes

The use of ignition sources such as welding, flame cutting, brazing, grinding, arc gouging, and open flame soldering are controlled through the approval and issuance of a hot work permit. Hot work permits are reviewed and approved by appropriate plant personnel. The hot work permit is valid for one job and at the start of each shift with a permitted ignition source activity a job area inspection will be performed and documented.

The FHA is part of the Fire Protection Program. FHA results are documented on a fire area basis. They are broken down into separate discussions of classical fire protection features and a safe shutdown analysis for each fire area. The FHA is required to be updated before the receipt of new fuel, as part of the license conditions above. The FHA includes the following:

- a summary of the evaluation performed to determine the adequacy of the fire protection features for each fire area

- a discussion of the ability to achieve a safe shutdown in case of a fire in each fire area

The fire hazards and safe shutdown evaluation are performed by qualified nuclear, mechanical, electrical, and fire protection engineers. FHA and pre-fire plans conform to the applicable guidance in NFPA 801. The staff concluded that the applicant's capabilities meet the criteria in Chapter 7 of NUREG–1520. The staff determined that the applicant's equipment, facilities, and procedures provide reasonable assurance that adequate fire protection will be provided and maintained to meet the criteria of 10 CFR 70.23.

Emergency Preparedness

The staff's evaluation of the applicant's request for a 10 CFR Part 70 license, with regard to emergency planning, is provided below in SER Subsection 1.5S.5.9, "Parts 30 and 40 License Staff Review." In this review, the staff also evaluated the applicant's request for 10 CFR Parts 30 and 40 licenses. The staff found that the applicant has met the emergency planning-related requirements of 10 CFR 70.22(i)(1) for SNMs (fuel and non-fuel), so that before implementing the STP Units 3 and 4 EP[8] (i.e., during the period of time between the issuance of the COL and implementation of the STP Units 3 and 4 EP, which will occur before the Commission's 10 CFR 52.103(g) finding), an EP that meets 10 CFR 70.22(i)(3) is not required.

Environmental Protection

Receipt, inspection, and storage of new fuel before fuel loading is an activity subject to the requirements of 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material." The regulatory basis for the review of STP Units 3 and 4 that is applicable to the fresh

[8] The STP Units 3 and 4 Emergency Plan is included in the COL application, Part 5, "Emergency Plan"; and the staff's evaluation of the Emergency Plan is in SER Section 13.3, "Emergency Planning," of this report.

fuel assemblies for the first reactor core before fuel loading is in 10 CFR 70.22, 70.23, and 10 CFR Part 20 Subpart D. This staff review focused on the incremental impact, if any, on the STP Units 3 and 4 effluent control and monitoring and environmental monitoring programs related to the receipt, inspection, and storage of the SNM in the form of fresh fuel assemblies for the first reactor core loading, as applicable under 10 CFR Part 70.

The acceptance criteria for the NRC Part 70 review of the portion of the effluent control and monitoring and environmental monitoring programs are outlined in Section 9.4 of NUREG–1520. Although most portions of the acceptance criteria in Section 9.4 of NUREG–1520 are directly applicable to this review, other portions are not because of the scope of the proposed activities. For example, a review of an applicant's Integrated Safety Analysis of accidents is conducted for fuel cycle facilities but not for reactors, in accordance with 10 CFR 70.60. In addition, certain regulatory guides and other documents referenced in Section 9.4 of NUREG–1520 are specific to fuel cycle facilities.

Because the new fuel is sealed in fuel rods, there are no releases of radioactive materials from the SNM. Therefore, no effluent or environmental monitoring is required for normal operations involving the receipt, inspection, and storage of new fuel.

In Tier 1 departure STP DEP T1 2.5-1, "Elimination of New Fuel Storage Racks from the New Fuel Vault", the applicant eliminates the new fuel storage racks from the new fuel vault. The STP Units 3 and 4 new fuel will be stored in the spent fuel storage racks following receipt and inspection. The new fuel vault and new fuel storage racks will not be used to store new fuel. Therefore, the spent fuel storage racks will be providing the same level of support and protection to the new fuel as is to the spent fuel. The design and analysis of the spent fuel rack is documented in the Holtec International's report, "Licensing Report for South Texas Project Units 3 and 4 ABWR Spent Fuel racks," (proprietary, ML14199A607 and ML14199A608) and is incorporated by reference into Section 9.1.2, "Spent Fuel Storage," and in various COL information items described in Section 9.1.6, "COL License Information," of the COL FSAR.

NRC staff concluded, with reasonable assurance, that the applicant's conformance to the FSAR is adequate to prevent damage to new fuel that could result in an environmental release of licensed material. The design and associated preventative measures are adequate to protect the environment and public health and safety and to comply with the regulatory requirements imposed by the Commission in 10 CFR Part 20 Subpart D and Part 70.

Special Nuclear Materials Material Control and Accounting Review

The staff conducted a review of the applicant's MC&A Program description to determine whether the applicant had provided a description of an MC&A Program that would be capable of satisfying the regulatory requirements in 10 CFR Part 74, Subpart B, "General Reporting and Recordkeeping Requirements."

In accordance with 10 CFR 70.22(b), current applicants requesting a license to possess SNM must submit a full description of their program for the control and accounting of SNM in the applicant's possession and to show compliance with 10 CFR 74.31, 74.33, 74.41, or 74.51, as applicable. Also in accordance with 10 CFR 70.32(c), applicants requesting a license to possess SNM are subject to a license condition to maintain and follow a program for controlling and accounting for source material and SNM. Decreases in the program's effectiveness will be submitted as an amendment pursuant to 10 CFR 70.34. However, the requirements in 10 CFR 70.22(b) and 70.32(c) contain an exclusion for licensees governed by 10 CFR Part 50, "Domestic Licensing of Production and utilization Facilities"; including existing nuclear power plants. Moreover, the STP Units 3 and 4 COL application was submitted and accepted as a licensing action for a nuclear power plant under 10 CFR Part 52 instead of 10 CFR Part 50.

The 10 CFR Part 70 and 74 exclusions described above do not include 10 CFR Part 52 applicants, even though for purposes of the requirement, the applicants are the same type of facility. For both 10 CFR Parts 50 and 52 applicants, 10 CFR Part 74 Subpart B (excluding 74.17) contains the appropriate MC&A performance requirements. An adequate applicant submittal would describe the licensee program elements that meet the 10 CFR Part 74 requirements. Additionally, because the primary roles of the MC&A Program are to control and account for SNM, the licensee program elements would have to be developed and implemented before receiving SNM and be maintained as long as any SNM is onsite.

RG 5.29, "Nuclear Material Control systems for Nuclear Power Plants," provides American National Standard (ANSI) publication N15.8-2009, "Methods of Nuclear Material Control—Material Control Systems—Special Nuclear Material Control and Accounting Systems for Nuclear Power Plants," as an acceptable approach to the NRC staff for complying with the NRC regulations regarding MC&A requirements in Subpart B of 10 CFR Part 74 at nuclear power plants (Draft Regulatory Guide-DG-5057 was issued May 2015 [ML15015A271]). In this approach, the MC&A description provides assurance that the implemented program will meet the performance requirements of 10 CFR Part 74 Subpart B (excluding 10 CFR 74.17).

<u>Exemption Requests from 70.22(b), 70.32(c), 74.31, 74.41, and 74.51</u>

In order for the applicant to have the same requirements applied to the SNM MC&A Program as are applied to other reactors licensed under 10 CFR Part 50, the applicant submitted requests for exemption from 10 CFR Parts 70.22(b), 70.32(c), 74.31, 74.41, and 74.51 (ML11307A239). The staff finds that these exemptions are justified and should be granted. The staff's reviews of these exemption requests are in SER Section 1.11S.3.

<u>MC&A Review</u>

In a letter dated October 27, 2011 (11307A239), the applicant provided the following items:

- a request for exemptions from 10 CFR 70.22(b), 70.32(c), 74.31, 74.41, and 74.51

- an update to COL application Part 2 FSAR Chapter 13 Section 13.4S, Table 13.4S-1, "Operational Programs Required by NRC Regulations and Program Implementation," including a milestone for implementing Item 21 with respect to the SNM MC&A Program

- an updated COL application Part 2 FSAR Chapter 13 Subsection 13.5.3.4.1 that includes MC&A procedures requirements

- an update that includes a new description of the SNM MC&A Program as Attachment 2

The staff finds the following responses acceptable:

- The SNM MC&A Program will be implemented as an operational program before the receipt of SNM; and the program and its implementation will be fully described in the updated application, which is included as an operational program and commitment in Table 13.4S-1.

- The applicant proposed an update to FSAR Subsection 13.5.3.4.1 that includes procedural requirements for SNM in the applicant's SNM MC&A Program.

As stated above, the staff finds this information acceptable.

The review of the applicant's proposed SNM MC&A Program in Attachment 2 encompassed requirements in 70.22(a)(4); 74.11, "Reports of loss or theft or attempted theft or unauthorized production of special nuclear material"; 74.13, "Material status reports"; 74.15, "Nuclear material transaction reports"; and 74.19, "Recordkeeping." The staff concludes that the programs as described are acceptable and meet the regulatory requirements for:

- notification

- material balance and inventory listing reports

- nuclear material transaction reports

- records retention

- established procedures

- conducting a physical inventory and maintaining associated records

The staff finds that the applicant's changes to the application are acceptable in that the MC&A Program will be an operational program, and the development of MC&A procedures is formally annotated in the FSAR. The staff proposes the following license condition as it relates to the MC&A requirements in Part 74:

> **License Condition** – Before the initial receipt of special nuclear materials (SNM) onsite, the licensee shall implement the SNM Material Control and Accounting Program. No later than 12 months after issuance of the COL, the licensee shall submit to the Director of Office of New Reactors (NRO) a schedule that supports planning for and conduct of NRC inspections of the SNM Material Control and Accounting Program. The schedule shall be update every 6 months until 12 months before scheduled fuel loading, and every month thereafter until the SNM Material Control and Accounting Program has been fully implemented.

This license condition is included in the Subsection 1.5.S.5.6, "Parts 30, 40, and 70 License Conditions."

Fixed Site and Transportation Security for SNM in Regards to the 10 CFR 73.67 Review

This portion of the Part 70 materials review pertains to 10 CFR 73.67, "Licensee fixed site and in-transit requirements for the physical protection of special nuclear material of moderate and low strategic significance." This review considers the guidance in RG 5.59, "Standard Format and Content for a Licensee Physical Security Plan for the Protection of Special Nuclear Material of Moderate or Low Strategic Significance (1983)" and NRC RIS 2005-22, "Requirements for the Physical Protection During Transportation of Special Nuclear Material of Moderate and Low Strategic Significance: 10 CFR Part 73 vs. Regulatory Guide 5.59 (1983)."

For fixed site physical protection, the requirements of 10 CFR 73.67(a) and (f) are applicable because of the low-enrichment (less than 5 percent) in U-235 nuclear power reactor fuel described in Chapter 9.1.2 of the STP FSAR.

As part of the description of operational programs, FSAR Table 13.4S-1 Item 15, "Physical Security Plan," includes a proposed license condition that will allow fuel to be received onsite after the protected area is established. This is in accordance with 10 CFR 73.55, which requires a licensee to establish and maintain a Physical protection program before fuel is permitted to be onsite. The physical protection program requirements in 73.55 are more stringent than the physical protection system requirements of 73.67; as such, a 73.55 Physical Security Plan will automatically meet the requirements in 10 CFR 73.67(a) and (f). As described in the MC&A review in the previous subsection in this SER, in order to satisfy the requirements in 73.67(a)(2)(iii), the NRC will impose a license condition stating that the implementation of the appropriate MC&A program will precede the receipt of new fuel onsite.

Staff reviewed the application and, for the reasons stated above, finds that the requirements of 73.67(a) and (f) for the fixed site physical protection of SNM of low strategic significance will be met.

For in-transit physical protection, the requirements of 10 CFR 73.67(a), (c)(1) and (g) are applicable because of the low-enrichment (less than 5 percent) in U-235 nuclear power reactor fuel described in Section 9.1.2 of the STP FSAR.

As noted above, "MC&A Review," the applicable 10 CFR 74 requirements will be in place during receipt, possession, and removal of SNM at the plant, in accordance with 10 CFR 73.67(a)(2)(iii). In addition, Subsection 13.6.4 of the FSAR, "Transportation Physical Security Plan," states that the applicant and the SNM manufacturer will maintain the responsibility for the appropriate administrative MC&A requirements when acting as the shipper or receiver of the SNM, in accordance with 10 CFR 73.67(f). After reviewing the information provided by the applicant, the staff finds that the requirement of 10 CFR 73.67(a)(2)(iii) will be met.

Additionally, a security plan for transportation of reactor fuel is required under 10 CFR 73.67(c)(1). In FSAR Subsection 13.6.4, applicant stated that an SNM-qualified licensee with its own transportation security plan will be responsible for the offsite transport of reactor fuel. Staff reviewed and confirmed this information, and found it to be consistent with the requirements of 10 CFR 73.67(a), (c)(1) and (g), with the exception of (g)(2)(i) and (ii), discussed below.

The staff reviewed FSAR Section 13.6.4 for SNM-low strategic significance shipments originating from or arriving at the facility. The application did not address the requirements in 10 CFR 73.67(g)(2)(i) and (ii). Therefore, the staff developed a license condition requiring: 1) the implementation of the transportation security plan before fuel is transported onsite, 2) update of the FSAR in the next revision to include the requirements to check the SNM containers and their tamper seals upon receipt, and inform the shipper of the nuclear material received upon delivery.

The proposed license conditions are as follows:

1) Three months before fuel is transported onsite (protected area), the transportation physical security plan shall be implemented.

2) In the first required update of the FSAR in accordance with 10 CFR 50.71(e), FSAR Section 13.6.4, "Transportation Physical Security Plan," shall be updated to include requirements to inspect the integrity of the fuel's containers and tamper seals upon receipt of shipments of nuclear power reactor fuel and to notify the shipper of the receipt of the material in accordance with 10 CFR 74.15.

These license conditions are included in Part 30, 40, and 70 License Conditions section in Subsection 1.5S.5.6 of this SER. Applicant's adherence to this license condition will ensure that the requirements in 10 CFR 73.67(g)(2)(i) and (ii) will be met.

With regard to fixed site physical protection of SNM of low strategic significance, the staff reviewed the application and finds that, because applicant will be implementing and maintaining a 73.55 Physical Security Plan, and an applicable MC&A program prior to the delivery of reactor fuel, the applicant will meet the requirements of 73.67 (a) and (f) for the fixed site physical protection of SNM of low strategic significance, and the associated security orders supplementing these regulatory requirements. Concerning in-transit physical protection for SNM of low strategic significance, NINA's submitted application states that a SNM-licensed shipper with its own transportation security plan will be utilized for the transport of the reactor fuel. In addition, the applicable Part 74 material control and accounting requirements for SNM of low strategic significance will be in place for both NINA and the licensed shipper when in-transit operations involving SNM of low strategic significance commence. Furthermore, a license condition applies that ensures the receiving requirements in 10 CFR 73.67(g)(2)(i) and (ii) will be met. Therefore, all of the 10 CFR 73.67(a), (c)(1) and (g) requirements for in-transit physical protection of SNM of low strategic significance will be met. In summary, the staff finds that the applicable 10 CFR 73.67 requirements for physical protection of SNM of low strategic significance will be met.

<u>Physical Protection Program (in regards to the 10 CFR 73.55 Review)</u>

Part 8 of the application contains the STP Units 3 and 4 security plan that is referenced in Part 2, FSAR Section 13.6. This information includes the Physical Security Plan that contains safeguards information defined by 10 CFR 73.21; its disclosure to unauthorized individuals is prohibited in Section 147 of the Atomic Energy Act. The staff's safety review of this information under 10 CFR Part 52 for the licensing and operation of STP Units 3 and 4 is in SER Section 13.6.

Per 10 CFR 73.55, “Requirements for physical security protection of licensed activities in nuclear power reactors against radiological sabotage,” the staff reviewed the applicant’s proposed security plan in Part 2 of FSAR Chapter 13, Section 13.6 of the application. The staff finds that the applicant has satisfied the regulatory requirements and provided the required information relating to physical security. The staff concludes that the applicant has provided the necessary programmatic elements in the Physical Security Plan, the training and qualification plan, and the safeguards contingency plan which provides a high assurance that activities involving SNM are not inimical to common defense and security and do not constitute an unreasonable risk to public health and safety.

#### 1.5S.5.9 Parts 30 and 40 License Staff Review

In order to satisfy NRC regulations and requirements for the receipt, possession, and use of byproduct and/or source materials, the applicant needed to address the following main areas for review per the guidance in NUREG–1556, “Consolidated Guidance About Materials Licenses,” Volume 7, “Program-Specific Guidance about Academic, Research and Development, and Other Licenses of Limited Scope Including Gas Chromatographs and X-Ray Fluorescence Analyzers,” Section 8:

- General Information – License action type, legal identities, address, points of contact
- Materials to be possessed and used
- Financial assurance and recordkeeping
- Individuals responsible for the Radiation Safety Program and training and experience, etc.
- Training for workers in restricted areas
- Facilities and equipment
- Radiation Safety Program
- Waste management
- Physical security
- Emergency preparedness

<u>General Information</u>

The Part 30 and 40 licenses requested by the applicant are described above in Subsections 1.5S.5.2, “Parts 30, 40, and 70 License Requests,” 1.5S.5.3, “Parts 30, 40 and 70 License Request Clarifications,” and 1.5S.5.6, “Parts 30, 40, and 70 License Conditions.” The legal identities, addresses, and points of contact are described in Part

1 Section 1.2 of the application.  The staff finds that the applicant has adequately addressed this information.

Materials To Be Possessed and Used

The possession and proposed uses of Parts 30 and 40 materials are described above in the Subsection 1.5S.5.5, "Parts 30, 40, and 70 Materials and Use Clarifications"; 1.5S.5.2, "Parts 30, 40, and 70 License Requests", and 1.5S.5.3, "Parts 30, 40, and 70 License Request Clarifications."  The staff finds that the applicant has adequately identified the possession and proposed uses of materials.

Financial Assurance and Recordkeeping for Decommissioning

The applicant describes this information in the Decommissioning Funding Report in Part 1 Section 1.4.  This information is discussed and reviewed in Subsection 1.5S.2.2 of this SER.  The staff finds that the applicant has adequately addressed these items.

Individuals Responsible for the Radiation Safety Program:  Qualifications, Training, and Experience

The RP Program for STP Units 3 and 4 is described in FSAR Sections 12.5 and 12.5S.  In SER Chapter 12, the staff finds the applicant's programs acceptable.  In regard to radiation protection managers, supervisors, and technicians, FSAR Section 13.1 describes the job and function for these positions as well as their qualification and training in conjunction with NEI 07-03A, which is referenced by the applicant in FSAR Section 12.5S.  The staff reviewed this information in SER Chapter 12 and finds it acceptable.

Training for Workers in Restricted Areas

The RP Program for STP Units 3 and 4 is described in FSAR Sections 12.5 and 12.5S.  In SER Chapter 12, the staff finds the applicant's programs acceptable.  The training criteria for workers in restricted areas are described in FSAR Sections 12.5S and 13.1.  In SER Chapter 12, the staff reviews this information and finds it acceptable.

Facilities and Equipment

The design features for radiation protection are described in FSAR Section 12.3.  In addition, FSAR Sections 12.5 and 12.5S describe the facilities, instrumentation, and equipment provided to support the implementation of the RP Program.  The staff reviewed this information in SER Chapter 12 and finds it acceptable.

Radiation Safety Program

The applicant describes the RP Program in FSAR Section 12.5.  In Chapter 12 of this SER, the staff reviews and finds the applicant's RP Program acceptable.  Qualifications, training, and experience for managers, supervisors, and technicians are described in FSAR Section 13.1 and NEI 07-03A, which is referenced in FSAR Section 12.5S.  The staff reviewed this information in SER Chapter 13.  Radiation control procedures and the maintenance of radiation records will be established by the applicant's RP Program.  In addition, FSAR Table 13.4S-1 provides the applicant's commitments to implement the

RP Program. The staff reviewed this information in SER Chapters 12 and 13 and finds it acceptable. The staff finds that the applicant has adequately addressed these items.

Waste Management

The radioactive waste management system includes the liquid waste management system (LWMS, Section 11.2); gaseous waste management system (GWMS, Section 11.3); solid waste management system (SWMS, Section 11.4); and process effluent radiation monitoring and sampling systems (PERMS, Section 11.5) as described in the FSAR. In Chapter 11 of this SER, the staff evaluated these systems and associated programs and information supplied by the applicant. The staff concludes that the information pertaining to the applicant's waste management systems and programs in Chapter 11 is acceptable.

Physical Security

The applicant's Physical Security Program is described in FSAR Section 13.6, "Physical Security." In Section 13.6 of this SER, the staff reviewed the applicant's Physical Security Program and finds it acceptable.

Emergency Preparedness

The following regulations address emergency planning requirements associated with the issuance of licenses to receive, possess, and use byproduct, source, or SNM:

- 10 CFR 30.32(i)(1) requires that each application to possess radioactive materials in an unsealed form, on foils or plated sources, or sealed in glass in excess of the quantities in 10 CFR 30.72, "Schedule C—Quantities of radioactive materials requiring consideration of the need for an emergency plan for responding to a release," must contain either (1) an evaluation showing that the maximum dose to a person offsite from a release of radioactive materials would not exceed 1 rem effective dose equivalent or 5 rems to the thyroid; or (2) an EP for responding to a release of radioactive material that provides the information identified in 10 CFR 30.32(i)(3).

- 10 CFR 40.31(j)(1) requires that each application to possess uranium hexafluoride in excess of 50 kilograms in a single container or 1000 kilograms total must contain either (1) an evaluation showing that the maximum intake of uranium by a member of the public from a release would not exceed 2 milligrams; or (2) an EP for responding to the radiological hazards of an accidental release of source material and to any associated chemical hazards directly incident thereto that provides the information identified in 10 CFR 40.31(j)(3).

- 10 CFR 70.22(i)(1) requires that each application to possess enriched uranium or plutonium for which a criticality accident alarm system is required, uranium hexafluoride in excess of 50 kilograms in a single container or 1000 kilograms total, or in excess of 2 curies of plutonium in an unsealed form or on foils or plated sources must contain either (1) an evaluation showing that the maximum dose to a member of the public offsite from a release of radioactive materials would not exceed 1 rem effective dose equivalent or an intake of 2 milligrams of soluble uranium; or (2) an EP for responding to the radiological hazards of an accidental release of special nuclear material and to any associated chemical hazards directly incident thereto that provides the information identified in 10 CFR 70.22(i)(3).

Pursuant to Section (a) of 10 CFR 52.8, "Combining licenses; elimination of repetition," in Revision 4 of the COL application, Part 1 Section 1.0, "Introduction," the applicant stated that in addition to the COL application, NINA requests special nuclear material licenses, byproduct material licenses, and source material licenses as required for construction and operation.[9] Further, in the COL application Part 1 Section 1.1, "License Actions Requested," NINA stated that "[t]his application is for the necessary licenses issued under 10 CFR Part 30, 10 CFR Part 40, and 10 CFR Part 70 to receive, possess, and use byproduct, source, and special nuclear material."[10]

In the COL application Part 1 Section 1.0, NINA incorporated by reference Appendix A to 10 CFR Part 52. NRC staff previously examined radiation sources associated with the ABWR standard design and discusses these materials in Section 12.2, "Radiation Sources," of NUREG–1503 (ML080710117). ABWR DCD Tier 2 Section 12.2.1, "Contained Sources," describes contained sources of radiation that are used as the basis for designing the radiation protection features (including radiation shielding) and for personnel dose assessment.

DCD Tier 2 Section 12.2.1 does not provide a detailed description of radioactive materials associated with 10 CFR Parts 30, 40, and 70 licenses. In addition, DCD Tier 2 Section 12.2 does not include COL license information (i.e., a COL action item) that requires the COL applicant (referencing the ABWR design) to address any additional radiation sources (e.g., those used for instrument calibration or radiography). Furthermore, the applicant did not provide a detailed description of radioactive materials in the COL application Part 2 (FSAR) Section 12.2, "Radiation Sources."

The applicant did, however, provide a description of radioactive materials associated with 10 CFR Parts 30, 40, and 70 licenses in Part 1 Section 1.1 of the application, which states in part that "[s]pecial nuclear material shall be in the form of reactor fuel and spent fuel, in accordance with limitations for storage and amounts required for reactor operation. Additionally, byproduct, source, and special nuclear material shall be in the form of sealed neutron sources for reactor startup and sealed sources for reactor instrumentation, radiation monitoring equipment, calibration, and fission detectors in amounts as required."

In the July 28, 2010, RAI 13.03-74 (ML102090634), the staff asked the applicant to discuss the implementation of the EP before the receipt of byproduct material and new fuel. In the September 9, 2010, revised response to this RAI (ML102570060), the

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[9] See also 10 CFR 52.77, "Contents of applications; general information," and referenced Section (e) of 10 CFR 50.33, "Contents of applications; general information," which requires the applicant to list other licenses except operator's licenses issued or applied for in connection with the proposed facility.

[10] COL application Part 3, "Environmental Report," Table 1.2-2, "Authorizations/Permits Required for Preconstruction Activities," lists additional licenses and authorizations required for construction and operation of. STP Units 3 and 4. These include activities for the possession of byproduct and SNM associated with 10 CFR Part 30 and Part 70, respectively.

applicant stated that 10 CFR 30.32(i) and 10 CFR 40.31(j) are not applicable to STP Units 3 and 4 before operation, and that the intent is not to implement the EP before the receipt, possession, or use of byproduct or source materials. Furthermore, implementation of the EP before the receipt of new fuel will not be required because an accident involving SNM is not probable based on its storage in high-density fuel racks.

The assessment of fuel criticality safety is discussed in Subsection 1.5S.5.8 of this SER. In addition, the need for a criticality accident alarm system is discussed below in the applicant's October 9, 2014, revised (Revision 2) RAI 01-26 and in the February 25, 2010, response to RAI 12.03-12.04-15 (ML14294A463 and ML100610277, respectively).

Subsequently, in the letter dated April 6, 2011 (ML110980614), the applicant proposed a revision to the COL application Part 1 Section 1.1, withdrawing the request to receive, possess, and use material under 10 CFR Parts 30 and 40 but retaining the request for a license under 10 CFR Part 70. The applicant based these changes on its inability to determine the quantities and source form of the radioactive materials at that time. The applicant stated that as it identified the need to procure radioactive materials for the STP, it would then apply for the appropriate licenses to possess these materials. The staff confirmed that these proposed Section 1.1 changes were incorporated into FSAR Revision 6 (ML112720006) and remained in the FSAR through Revision 10 (ML13310B522).

The applicant submitted the response to RAI 01-26 on August 18, 2014 (ML14226A989). The staff disagreed with NINA's proposed withdrawal of the Parts 30 and 40 license requests, and explained why such licenses are required to support activities conducted under the 10 CFR Part 52 license. The staff asked NINA to update the COL application to include a request for the material licenses necessary to construct and operate the reactor(s); including making any other required COL application changes.

In the October 9, 2014, revised (Revision 2) response to RAI 01-26 (ML14294A463), the applicant stated that COL application Part 1, Section 1.1 will be revised to include a request for 10 CFR Part 30 and Part 40 licenses. The applicant provided the proposed Section 1.1 revised text. In addition, NINA provided a detailed description of the form, quantity, use, and limitations of byproduct, source, and SNM associated with the 10 CFR Parts 30, 40, and 70 (fuel and non-fuel) license requests. The applicant also stated that during the period before the implementation of the STP Units 3 and 4 EP no specific byproduct, source, or SNM related to an EP will be necessary because:

(1) No byproduct material will be received, possessed, or used in a physical form that is "in unsealed form, on foils or plated sources, or sealed in glass" that exceeds the quantities in Schedule C in 10 CFR 30.72

(2) No 10 CFR Part 40 specifically licensed material including natural uranium, depleted uranium, and uranium hexafluoride, will be received, possessed, or used during this period

(3) The special nuclear material to be received, possessed, or used does not involve enriched uranium for which a criticality accident alarm system is required, uranium hexafluoride in excess of 50 kilograms in a single container or 1000 kilograms total, or in excess of 2 curies of plutonium in an unsealed form or on foils or plated sources

For 10 CFR Part 40 materials, the applicant further stated that "[n]o 10 CFR Part 40 specifically licensed material, including natural uranium, depleted uranium, and uranium hexafluoride, will be received, possessed, or used during the period between issuance of the COL and the 10 CFR 52.103(g) finding." On October 21, 2014, the applicant submitted COL application Revision 11. The staff confirmed that the proposed changes to the COL application in Part 1, Section 1.1 were incorporated.

With regard to the requirements in 10 CFR 70.22(i)(1) dealing with enriched uranium or plutonium, in RAI 12.03-12.04-15 dated January 28, 2010 (ML100280568), the staff asked the applicant to provide information demonstrating that STP Units 3 and 4 meet the criticality accident monitoring requirements of 10 CFR 70.24. In the response dated February 25, 2010 (ML100610277), the applicant stated that the information demonstrating that STP Units 3 and 4 meet the criticality accident monitoring requirements of 10 CFR 70.24 will be provided by meeting the requirements of 10 CFR 50.68(b), which is allowed by 10 CFR 70.24(d)(1). The applicant addressed the eight requirements in 10 CFR 50.68(b) and proposed a revision to FSAR Subsection 12.3.7.3, "Requirements of 10 CFR 70.24," to reflect this approach. The staff (1) reviewed the applicant's response against the requirements in 10 CFR 50.68(b); (2) determined that 10 CFR 50.68(b) does not require a criticality accident monitoring system, so the respective EP requirements in 10 CFR 70.22(i)(1) do not apply; and (3) confirmed that the change to FSAR Subsection 12.3.7.3 was made in Revision 4 of the COL application. Therefore, this issue in RAI 12.03-12.04-15 is resolved to the extent that it addresses the requirements for an EP pursuant to 10 CFR 70.22(i)(1).[11]

The staff reviewed the RAI responses and the updated COL application discussed above against the applicable requirements in 10 CFR 30.32(i)(1), 10 CFR 40.31(j)(1), and 10 CFR 70.22(i)(1). The staff concluded that the applicant's identified quantities of byproduct, source, and SNMs do not involve enriched uranium or plutonium for which a criticality accident alarm system is required; and they do not exceed the respective required threshold quantities associated with the need for an EP before the implementation of the STP Unit 3 and 4 EP. The staff finds that the applicant has adequately addressed whether there is a need to implement an EP before the receipt of byproduct, source, and SNM (fuel and non-fuel). The applicant also included in the COL application a request for the necessary material licenses under 10 CFR Parts 30, 40, and 70. The applicant's collective responses to RAI 13.03-74 and RAI 01-26 are thus acceptable, and these RAIs are resolved and closed.

The staff therefore finds that the applicant has met the requirements of 10 CFR 30.32(i)(1), 10 CFR 40.31(j)(1), and 10 CFR 70.22(i)(1). An EP that meets the requirements in 10 CFR 30.32(i)(3), 10 CFR 40.31(j)(3), or 10 CFR 70.22(i)(3) is not required before the implementation of the STP Units 3 and 4 EP.

### 1.5S.5.10 Part 37

On March 19, 2013, a new rule under 10 CFR Part 37," Physical Protection of Category 1 and Category 2 Quantities of Radioactive Material," was published the Federal Register (78FR 16922). The NRC amended its regulations to establish security requirements for the use and transport of Category 1 and Category 2 quantities of

[11] This RAI addresses COL License Information Item 12.8, which is discussed further in Section 12.3, "Radiation Protection Design Features," of this SER.

radioactive material.  The NRC considers these quantities to be risk significant that therefore warrant additional protection.  Category 1 and Category 2 thresholds are based on the quantities established by the International Atomic Energy Agency (IAEA) in its Code of Conduct on the Safety and Security of Radioactive Sources, which the NRC endorses.  The objective of the 10 CFR Part 37 rule is to provide reasonable assurance of preventing the theft or diversion of Category 1 and Category 2 quantities of radioactive material.  The regulations also include security requirements for transporting irradiated reactor fuel that weighs 100 grams or less in net weight of irradiated fuel.  The 10 CFR Part 37 rule affects any licensee possessing an aggregated Category 1 or Category 2 quantity of radioactive material, any licensee transporting these materials using ground transportation, and any licensee transporting small quantities of irradiated reactor fuel.  The 10 CFR Part 37 rule compliance date was March 19, 2014.

However, the regulations of 10 CFR Part 37 do not require COL applicants to address 10 CFR Part 37 as part of the licensing process.  After issuing a COL, the licensee must provide written notification to the NRC regional office at least 90 days before aggregating radioactive material that equals or exceeds the Category 2 threshold.  The COL licensee becomes subject to the requirements of this regulation upon taking possession of an aggregated Category 1 or Category 2 quantity of radioactive material.  The applicant did not address Part 37 in the COL application, and the staff did not perform any review related to Part 37.

### 1.5S.6 Aircraft Impact Assessment 10 CFR Part 50.150

Before the docketing date of the COL application for STP Units 3 and 4, 10 CFR Part 52, Subpart C, “Combined Licenses,” Section 52.79 was revised.  A new paragraph, 52.79(a)(47), was added requiring the applicant’s FSAR to contain the information required by 10 CFR 50.150, “Aircraft Impact Assessment.”  However, the COL application did not address the new requirement.  This issue was tracked as Open Item 01-7 in the SER with open items.

On June 30, 2009, STPNOC submitted an application to amend the DCR for the U.S. ABWR (ML092040048).  On September 23, 2010, STPNOC submitted the revised final application (ML102770376).  The purpose of the application is to amend the design to comply with the requirements of 10 CFR 50.150.  The COL application references the ABWR standard design as modified by the STPNOC application to amend the ABWR design.

As part of the design certification amendment review, NRC staff reviewed the application and found STPNOC’s ABWR amendment acceptable, because the information meets 10 CFR 50.150 and does not adversely affect the previously certified design (ML1027101980).  As part of the COL application review, the staff issued RAI 01-18 requesting the applicant to incorporate by reference the ABWR aircraft impact amendment in the next revision of the FSAR.  In addition, this RAI requested the applicant to identify (1) any site-specific design changes to address the AIA; (2) if any of the Tier 1 or Tier 2 departures had any effect on the key design features credited in the AIA; and (3) any additional Tier 1 and Tier 2 departures to implement the AIA.  In the response to this RAI dated August 4, 2010 (ML 102180178), the applicant stated that Revision 4 of the STP Units 3 and 4 COL application would incorporate by reference the ABWR amendment application for aircraft impact.  The applicant added that no STP Units 3 and 4 site-specific design changes are anticipated to address aircraft impacts.  In addition, the applicant reviewed all Tier 1 and Tier 2 departures, as described in Part 7 of the STP Units 3 and 4 COL application. The applicant determined that none of the departures affects the overall conclusions relative to aircraft impact. Furthermore, no additional departures for STP Units 3 and 4 will be needed to address the requirements of 10 CFR 50.150. The staff confirmed that Revision 4 of the FSAR incorporated the proposed information. Therefore, RAI 01-18 is resolved and closed.

In RAI 01-20, the staff requested that the applicant describe how it came to the conclusion that "none of the departures affects the overall conclusions in Appendix 19S relative to aircraft impact" as stated in the response to RAI 01-18. The staff also requested that the applicant provide a list of departures that were related to key design features credited in the AIA. Finally, the staff requested that the applicant document the conclusions in the Departures Report. In the response to this RAI dated March 1, 2011 (ML110630408), the applicant provided a list and brief description of the departures that relate to key design features that were credited for AIA as described in Appendix 19S.4 of the STPNOC ABWR DCD amendment application. The applicant performed an evaluation of each departure to determine if that departure would have changed the conclusion as stated in Section 19S.5, which states, "This assessment based upon NEI 07-13, concludes that the ABWR can continue to provide adequate protection of the public health and safety in the event of an impact of a large, commercial aircraft, as defined by the NRC. The aircraft impact would not inhibit the ABWR's core cooling capability and spent fuel pool integrity based on best estimate calculations." The results of the applicant's evaluation show that all of the key design features credited in Appendix 19S.4 are either unaffected or enhanced by the identified departures, and therefore, the conclusions in Appendix 19S.5 are unaffected by these departures. These departures do not adversely impact the basic design and physical separation of the emergency core cooling system (ECCS), and do not affect the alternate feedwater injection (AFI) system. These departures do not adversely affect the location and design of the reactor building, control building, turbine building, or the spent fuel pool and its supporting structure that are credited in the assessment to meet the AIA rule. These departures do not affect the ability of the primary containment to protect components inside the containment from a postulated aircraft impact. These departures do not change the design and location of fire barriers (including doors) as described in FSAR Sections 9.5.1 and 9A.4 for the reactor building and control building to limit the effects of internal fires created by a postulated aircraft impact. The applicant stated that the detailed evaluation for each departure is available for NRC review. In addition, the applicant proposed to revise the Departure Report to include the overall conclusion of the evaluations. The staff reviewed the applicant's response to RAI 01-20 and determined that the applicant evaluated the STP Units 3 and 4 departures affecting AIA key design features and considered the effect of the departures on the original assessment as required by 10 CFR 50.150(c). The staff confirmed that the proposed change to the Departure Report (Part 7) has been incorporated in Revision 6 of the application. Therefore, RAI 01-20 is resolved and closed.

The staff reviewed Revision 4 of the STP Units 3 and 4 application and found that the applicant did not adequately incorporate by reference the latest revision of the STPNOC ABWR DCD amendment application. In RAI 01-19, the staff requested that the application incorporate by reference the latest revision of the STPNOC ABWR DCD amendment application and identify every place in the STP Units 3 and 4 application where the amendment will be incorporated by reference. In the response to RAI 01-19 dated January 11, 2011 (ML110130488), the applicant stated that it would update the next revision of the FSAR to incorporate Revision 3 of the STPNOC DCD supporting the ABWR DCD amendment in every location in the FSAR where the amendment revises the DCD. The staff confirmed that the proposed changes to various sections and subsections of the FSAR (Part 2) have been incorporated in Revision 6 of the application. Therefore, RAI 01-19 is resolved and closed. SER Open Item 01-7 is also closed.

Based on the above discussion, the staff concludes that the applicant, by incorporating by reference STPNOC's proposed amendment to the ABWR design certification, has satisfied the requirements of 10 CFR 50.150 and 52.79(a)(47).

## 1.5S.7 Foreign Ownership, Control, or Domination

### 1.5S.7.1 Introduction

The applicant requested the NRC to issue two Class 103 COLs for the construction and operation of STP Units 3 and 4, which will be located in Matagorda County in the State of Texas. Section 103d. of the AEA; 10 CFR 50.38, "Ineligibility of certain applicants"; and 10 CFR 52.75, "Filing of applications"; prohibit the issuance of a COL to any entity if the Commission knows or has reason to believe that the entity is owned, controlled, or dominated by an alien, by a foreign corporation, or by a foreign government. As part of its license application review, the staff must evaluate the applicants for foreign ownership, control, or domination (FOCD).

According to Revision 12 of Part 1 of the COL application, "General and Financial Information," the applicants for the proposed STP Units 3 and 4 are NINA, STPNOC, NINA 3, NINA 4, and CPS Energy. Specifically:

- NINA seeks a license under Section 103 of the AEA and 10 CFR Part 52 to construct, possess, and use the proposed units, including related materials licenses under 10 CFR Parts 30, 40, and 70.

- STPNOC seeks a license under Section 103 of the AEA and 10 CFR Part 52 to possess, use, and operate the proposed units, including related materials licenses under 10 CFR Parts 30, 40, and 70.

- NINA 3 and CPS Energy seek licenses under Section 103 of the AEA and 10 CFR Part 52 to possess and own STP Unit 3.

- NINA 4 and CPS Energy seek licenses under Section 103 of the AEA and 10 CFR Part 52 to possess and own STP Unit 4.

CPS Energy would own 7.625 percent of the proposed units, while NINA 3 would own 92.375 percent of STP Unit 3 and NINA 4 would own 92.375 percent of STP Unit 4. NINA 3 and NINA 4 are wholly-owned subsidiaries of NINA. Toshiba America Nuclear Energy Corporation (TANE) owns approximately 10 percent of NINA, while Texas Genco Holdings, Inc. owns approximately 90 percent of NINA. TANE is wholly owned by Toshiba Corporation, a Japanese corporation, and Texas Genco Holdings, Inc., is wholly owned by NRG Energy Inc., (NRG), a U.S. corporation.

Following the events in Fukushima, Japan, in March of 2011, NRG, with an approximate 90 percent indirect ownership stake in NINA, decided to discontinue its funding of STP

Units 3 and 4 and write-off its investments in them. Aside from NRG's paying some expenses to wind up its financial involvement in the project, all future financing would be made by Toshiba, through its U.S. subsidiary TANE. NRG would retain its ownership interest in the project. However, as NRG would be providing no further funding, its ownership stake in the project would become diluted over time should Toshiba's future contributions be in the form of equity. Based on these changes, the intervenors submitted a contention (ML111361048) on May 16, 2011, alleging improper FOCD of STP Units 3 and 4. On September 30, 2011, the Atomic Safety and Licensing Board (ASLB) admitted this contention (ML14028A554).

Preceding the ASLB's decision on whether to admit the contention, NINA made significant revisions to Part 1 of its COL application. NINA submitted this information in Revision 6 to its COL application dated August 30, 2011 (ML11252A505). In Revision 6 of the application, NINA sought approval for up to 90 percent of foreign ownership, which would equate to up to 85 percent of indirect foreign ownership of the proposed units.

The staff reviewed Part 1 of Revision 6 to the COL application as well as the applicant's proposed negation action plan (NAP) addressing any FOCD issues. Because the applicant had not identified any potential domestic sources of funding and was seeking approval of a high percentage of foreign ownership, the staff determined that NINA was subject to impermissible FOCD by Toshiba through its U.S. subsidiary TANE. The staff informed NINA of this determination in a letter dated December 13, 2011 (ML113390176).

In response to the staff's December 13, 2011, NINA again revised Part 1 and submitted it with Revision 8 to the STP COL application on September 17, 2012 (ML12291A415). The changes to Part 1 in Revision 8 of the COL application included the following statement:

> NINA is owned approximately 90% by NRG Energy, and NRG Energy exercises voting control over NINA. NINA does not anticipate any material change in its current ownership prior to issuance of the requested licenses. Toshiba America Nuclear will not own more than 10% unless a higher ownership percentage is approved or otherwise authorized in writing by the NRC.

Revision 8 to Part 1 of the application further stated that following the issuance of any COLs, NINA would ensure that a minimum of 50 percent of the funding for any licensed construction activity would be obtained from U.S. sources; and any future change in ownership of 5 percent or more of NINA would not occur without seeking either staff approval of a license transfer under the provisions of 10 CFR 50.80, or a staff threshold determination stating that such a license transfer is not necessary.

In addition to the changes to Part 1, the COL application contained a revised NAP as Appendix 1D to FSAR Chapter 1. The NAP includes two key components: the formation of a Security Committee and a Nuclear Advisory Committee (NAC). The Security Committee would consist of the Chairman of NINA's Board of Directors and two independent Member Directors. All three directors would be required to be U.S. citizens. This Security Committee would be assigned "exclusive authority" to vote upon and decide for the Board all matters coming before the Board that relate to nuclear safety, security, or reliability. The NAP proposes a delegation of specific decision-making authorities related to nuclear safety, security, and reliability to the Security Committee.

The NAP also describes the composition and role of the NAC. The applicant stated it would establish a NAC in order to provide independent oversight throughout the design, construction, and operation of STP Units 3 and 4 with respect to FOCD matters, including monitoring the effectiveness of the NAP. According to the applicant, the NAC will provide transparency to the NRC and other U.S. governmental authorities regarding any potential for foreign control or domination of NINA or STPNOC during the time NINA is acting as the licensee responsible for the design and construction and the time STPNOC is acting as the licensee responsible for operations. The NAC will be governed by a charter and composed of at least three independent individuals, all U.S. citizens but not officers, directors, or employees of STPNOC, NINA, or any of the STP owners or their affiliates. The members of the committee are to report annually to the Board and NRC on FOCD issues.

After reviewing the changes NINA made to its application and after further interactions with NINA through public meetings and RAIs, the staff informed NINA by letter dated April 29, 2013, (ML13105A387) that the staff had determined that CPS Energy and STPNOC were not subject to FOCD, but NINA and its wholly-owned subsidiaries NINA 3 and NINA 4 were subject to foreign control by Toshiba. As explained in the evaluation enclosed with that letter (ML13150A284 [non-proprietary version]; ML13105A387 [proprietary version]), the staff made its determination primarily because Toshiba, through TANE, was the sole source of financing for NINA. The staff also considered TANE's ownership stake in NINA, TANE's representation on NINA's Board of Directors, and rights that TANE could exercise through its contractual arrangements. The staff further determined that the proposed NAP did not negate this foreign control.

The staff's letter to NINA dated April 29, 2013, triggered the process for an evidentiary hearing on the intervenors' contention—including the submission of pre-filed testimony and position statements. On January 6–8, 2014, the ASLB held an evidentiary hearing in Houston, Texas.

On April 10, 2014, the ASLB issued its Third Partial Initial Decision (ML14111A456) on the FOCD contention. In this decision, the ASLB provided its findings in the areas of corporate ownership, corporate governance, financial control, FOCD negation, and proposed license conditions. With regard to corporate ownership of STP Units 3 and 4, the ASLB determined that Toshiba's indirect foreign ownership of NINA does not in and of itself indicate that NINA is subject to FOCD. The ASLB cited previous NRC decisions indicating that there is no blanket prohibition on indirect foreign ownership of an applicant or licensee. The ASLB concluded that the "the ten percent indirect foreign ownership by Toshiba, through TANE, does not, in and of itself, indicate that NINA's ownership structure contravenes the AEA's prohibition on foreign ownership, control, or domination."

With regard to corporate governance, the ASLB concluded that NINA's corporate governance does not in and of itself indicate that NINA is subject to impermissible FOCD. The ASLB based this conclusion on its findings that (1) NRG controls 90 percent of the voting power on NINA's Board of Directors and has exclusive control of all decisions involving nuclear safety, security, and reliability; (2) the Chairman of NINA's Board, the selection of whom is controlled by NRG, must be a United States Citizen; (3)

NINA's CEO, the selection of whom is controlled by NRG, must be a United States citizen and has ultimate authority on all issues affecting nuclear safety, security, and reliability; and (4) TANE's veto power does not extend to matters involving nuclear safety, security, or reliability.

With regard to financial control, the ASLB concluded that Toshiba, through TANE, lacks financial control of NINA. The ASLB based its conclusion primarily on its finding that there was no evidence of the manifestation of any control of NINA by TANE. The ASLB found, therefore, that the current funding of STP Units 3 and 4 does not contravene the AEA's prohibition on FOCD.

Regarding the applicant's NAP, the ASLB found that it is consistent with NAPs previously approved by the staff. Among the various features of the NAP, the ASLB found the Security Committee and NAC provisions to be particularly compelling. The ASLB also noted the limit on TANE's ownership to 10 percent and the requirement for staff approval to increase this ownership along with the fact that the staff's SRP on FOCD states that a foreign entity may provide more than 50 percent of the funding for a project. Based on these facts and the absence of any evidence of financial control by TANE, the ASLB concluded that NINA's NAP is adequate.

At the request of the ASLB, NINA submitted proposed license conditions to address FOCD. Because the ASLB concluded that NINA was not subject to FOCD and that NINA's NAP was adequate, the ASLB declined to decide the appropriateness of NINA's proposed license conditions. The ASLB left it to the NRC staff's discretion whether to include NINA's proposed license conditions in the COLs it issues for STP Units 3 and 4. With respect to substantial commitments made by NINA, the ASLB stated that the NRC staff could require NINA to amend its NAP to include these commitments, to include these commitments as license conditions, or both.

On May 5, 2014, the intervenors filed a petition seeking Commission review of the ASLB's ruling on FOCD. The Commission denied the petition for review on April 14, 2015 (ML15104A449).

### 1.5S.7.2 Summary of Application

In Revision 12 of the COL application, dated April 21, 2015 (ML15120A324), Part 1 of the application discusses issues related to FOCD and Appendix 1D of the FSAR contains a full discussion of the applicants' FOCD Negation Action Plan.

### 1.5S.7.3 Regulatory Basis

The applicants' request for the NRC to issue two Class 103 combined licenses for construction and operation is subject to, among other things, the requirements of the Atomic Energy Act; 10 CFR Part 52, Subpart C; and 10 CFR Part 50. This safety evaluation addresses FOCD issues.

Sections 103d. of the AEA states that no license may be issued to:

> an alien or any corporation or other entity if the Commission knows or has reason to believe it is owned, controlled, or dominated by an alien, a foreign corporation, or a foreign government.

Section 50.38 of 10 CFR is the regulatory provision that implements this statutory prohibition. Furthermore, with respect to COL applications, 10 CFR 52.75(a) states:

> Any person except one excluded by § 50.38 of this chapter may file an application for a combined license for a nuclear power facility with the Director, Office of New Reactors or Director, Office of Nuclear Reactor Regulation, as appropriate.

The NRC staff evaluates license applications for new facilities, and applications for approval of direct or indirect transfers of facility licenses using the NRC-issued SRP on FOCD, "Final Standard Review Plan on Foreign Ownership, Control, or Domination," published in the *Federal Register* on September 28, 1999 (64 FR 52355), to determine whether the applicants are owned, controlled, or dominated by an alien, a foreign corporation, or a foreign government.

### 1.5S.7.4 Technical Evaluation

As stated above and as explained in the NRC staff's April 29, 2013 evaluation (ML13150A284 [public version]), the NRC staff determined that neither STPNOC nor CPS Energy are subject to FOCD. With regard to NINA's corporate ownership, corporate governance and financial control, the ASLB concluded, as cited above, that NINA does not contravene the AEA's prohibition on FOCD in this case. Further, the ASLB in its decision determined that NINA's NAP was "… sufficient to negate potential FOCD issues arising now or during the licensing period…" The ASLB's decision remains the position of the NRC because that decision was not overturned on appeal. Accordingly, it is the NRC's position that neither NINA nor its subsidiaries (NINA 3 or NINA 4) are owned, controlled, or dominated by a foreign interest, and that there are no problematic FOCD issues for STP Units 3 and 4.

### 1.5S.7.5 Post Combined License Activities

As stated above, the ASLB left it to the NRC staff's discretion whether to include NINA's proposed license conditions or substantial commitments in the COLs it issues for STP Units 3 and 4. Having assessed these proposed license conditions and substantial commitments, the staff considers it prudent to include the following six license conditions based on conditions or substantial commitments proposed by NINA.

1. The proposed "Fourth Amended and Restated Operating Agreement of Nuclear Innovation North America LLC" shall be executed and enter into force within 60 days of the issuance of this license.

   The purpose of the license condition is to ensure that the NAP (which will be contained in the Fourth NINA Operating Agreement) will be implemented soon after the license is issued.

2.a. Any proposed change to the Negation Action Plan in Appendix 1D of the FSAR that would result in a decrease in the effectiveness of the Negation Action Plan may not be implemented without prior approval of the NRC.

2b. The Fourth Amended and Restated Operating Agreement of Nuclear Innovation North America LLC may not be modified in any material respect concerning decision-making authority of the Security Committee as defined therein without prior approval of the NRC.

The purpose of these license conditions is to require NRC approval of changes to the NAP that might reduce its effectiveness.

3. NINA shall take no action allowing TANE to have, and in any event NINA shall not recognize TANE as having, more than 10 percent of the voting equity interests of NINA in any membership class.

This license condition prohibits NINA from taking action to allow TANE to have more than 10% of the voting equity interests of NINA in any membership class. If TANE, nonetheless, is able to obtain more than 10 percent of the voting equity interests of NINA in any membership class, NINA would not be permitted to recognize such voting equity interest beyond 10 percent.

4. Following issuance of the COLs, NINA shall assure that any loans procured exclusively from foreign sources may only be used for purposes of project development and maintaining the licenses. NINA shall assure that at least 50% of the funding for any licensed construction activity is funded from U.S. sources whether through loans or through equity.

The purpose of this license condition is to ensure substantial U.S. funding for construction.

5a. NINA's Chief Executive Officer (CEO) and Chief Nuclear Officer, the Chairman of NINA's Board of Directors, the members of NINA's Security Committee and Nuclear Advisory Committee, and the CEO of STP Nuclear Operating Company must all be U.S. citizens.

5b. More than 50% of the voting interests in NINA shall be represented by Members of NINA's Board who shall be appointed by non-foreign owners and shall be U.S. citizens.

The purpose of these license conditions is to ensure that key decision makers are U.S. citizens.

6. The certificates that the Negation Action Plan requires the NINA CEO and the members of the NINA Security Committee to execute, including certificates to be executed upon the appointment of a new CEO or member of the Security Committee, shall be submitted to the NRC within 30 days of the execution of the certificate.

The Negation Action Plan requires the execution of certificates but does not require reporting to the NRC. The purpose of this license condition is to make the NRC aware that the required certificates have been executed.

### 1.5S.7.6 Conclusion

It is NRC's position that neither NINA nor its subsidiaries NINA 3 or NINA 4 are owned, controlled, or dominated by a foreign interest, and that there are no problematic FOCD issues associated with these applicants based on the foregoing. Additionally, as described above, the staff has no reason to believe that STPNOC or CPS Energy are owned, controlled, or dominated by a foreign interest, and had determined that CPS Energy and STPNOC were not subject to FOCD. Accordingly, the staff concludes that the FOCD requirements in Section 103d. of the AEA, 10 CFR 50.38, and 10 CFR 52.75, are satisfied with regard to the applicants.

## 1.6 General Electric Topical Reports and Other Documents (Related to RG 1.206, Section C.I.1.6, "Material Referenced")

### 1.6.1 Introduction

This FSAR section contains a comprehensive listing of GE reports that are applicable to the certified ABWR design.

### 1.6.2 Summary of Application

Section 1.6 of the STP Units 3 and 4 COL FSAR Revision 12 incorporates by reference Section 1.6 of the certified ABWR DCD Revision 4 with no departures.

In addition, in FSAR Section 1.6, the applicant provides the following:

Supplemental Information

Table 1.6-2 is a supplemental tabulation of GE Topical Reports incorporated by reference as part of the COL application.

### 1.6.3 Regulatory Basis

The regulatory basis for the information incorporated by reference is in NUREG–1503. In addition, the relevant requirements of the Commission regulations for the material referenced, and the associated acceptance criteria, are in Section 1.0 of NUREG–0800.

### 1.6.4 Technical Evaluation

As documented in NUREG–1503, NRC staff reviewed and approved Section 1.6 of the certified ABWR DCD. The staff reviewed Section 1.6 of the STP Units 3 and 4 COL FSAR and checked the referenced ABWR DCD to ensure that the combination of the information in the COL FSAR and the information in the ABWR DCD appropriately represents the complete scope of information relating to this topic.[12] The staff's review confirmed that the information in the application and the information incorporated by reference address the required information relating to GE topical reports and other documents.

The staff reviewed the following information in the COL FSAR:

[12] See *"Finality of Referenced NRC Approvals"* in SER Section 1.1.3, for a discussion on the staff's review related to verification of the scope of information to be included in a COL application that references a design certification.

Supplemental Information

The applicant's supplement to this section consists of incorporating by reference NEDO-32686-A, "Utility Resolution Guidance for ECCS [emergency core cooling system] Suction Strainer Blockage," October 1998. This is a topical report approved by the NRC staff. The staff therefore found it appropriate to incorporate this report by reference.

### 1.6.5 Post Combined License Activities

There are no post COL activities related to this section.

### 1.6.6 Conclusion

The NRC staff's finding related to information incorporated by reference is in NUREG–1503. NRC staff reviewed the application and checked the referenced DCD. The staff's review confirmed that the applicant has address the required information, and no outstanding information is expected to be addressed in the COL FSAR related to this section. Pursuant to 10 CFR 52.63(a)(5) and 10 CFR Part 52 Appendix A Section VI.B.1, all nuclear safety issues relating to GE topical reports and other documents that were incorporated by reference have been resolved.

In addition, the staff concluded that the relevant information in the COL application is acceptable, and satisfies NRC regulations. The staff's conclusion is based on the following:

- The staff's review confirmed that the applicant has adequately addressed the supplemental information in accordance with Section 1.0 of NUREG–0800.

## 1.7 Drawings (Related to RG 1.206, Section C.I.1.7, "Drawings and Other Detailed Information")

### 1.7.1 Introduction

This FSAR section contains drawings that are pertinent to the basic ABWR design. The section also details certain conversion factors, drawing symbols, and drawing standards utilized in the certified ABWR DCD. Furthermore, the STP Units 3 and 4 COL FSAR provides site-specific complementary information.

### 1.7.2 Summary of Application

Section 1.7 of the STP Units 3 and 4 COL FSAR Revision 12 incorporates by reference Section 1.7 of the certified ABWR DCD Revision 4.

In addition, in FSAR Section 1.7, the applicant provides the following:

Tier 1 Departures

- STD DEP T1 2.14-1 Hydrogen Recombiner Requirements Elimination

This design change removes the hydrogen recombiners. Table 1.7-1 contains a list of system piping and instrumentation diagrams (P&IDs), some of which are affected by the removal of the hydrogen recombiners.

- STD DEP T1 3.4-1 Safety-Related I&C Architecture

This design change revises the safety-related I&C architecture.

COL License Information Item

- COL License Information Item 1.2 P&ID Pipe Schedule

This COL license information item directs COL applicants to complete the P&ID schedule labeled as “COL applicant.” The applicant addresses this item in Subsection 1.7.2.1 by identifying the minimum pipe schedule for ANSI nominal pipe sizes for any individual piping system shown on a P&ID.

Supplemental Information

The applicant identifies two supplements to the DCD. FSAR Table 1.7-6 documents additional or updated I&C and electrical drawings, and Table 1.7-7 includes system drawings that are not part of the ABWR DCD.

## 1.7.3 Regulatory Basis

The regulatory basis of the information incorporated by reference is in NUREG–1503. In addition, the relevant requirements of the Commission regulations for the drawings and other detailed information, and associated acceptance criteria are in Section 1.0 of NUREG–0800.

In accordance with Section VIII of 10 CFR Part 52, Appendix A, the applicant identifies Tier 1 departures. Tier 1 departures require prior NRC approval and are subject to the requirements of 10 CFR Part 52 Appendix A, Section VIII.A.4.

The staff reviewed the following information in the COL FSAR:

## 1.7.4 Technical Evaluation

As documented in NUREG–1503, NRC staff reviewed and approved Section 1.7 of the certified ABWR DCD. The staff reviewed Section 1.7 of the STP Units 3 and 4 COL FSAR and checked the referenced ABWR DCD to ensure that the combination of the information in the COL FSAR and the information in the ABWR DCD appropriately represents the complete scope of information relating to this review topic.[13] The staff’s

[13] See *“Finality of Referenced NRC Approvals”* in SER Section 1.1.3, for a discussion on the staff’s review related to verification of the scope of information to be included in a COL application that references a design certification.

review confirmed that the information in the application and the information incorporated by reference address the required information relating to drawings.

Tier 1 Departures

The following Tier 1 departures identified by the applicant in this section require prior NRC approval in the form of an exemption and the full scope of their technical impact may be evaluated in the other sections of this SER. For more information, refer to COL application Part 7, Section 5.0 for a listing of all FSAR sections affected by these Tier 1 departures. In addition, compliance with 10 CFR Part 52 Appendix A Section VIII.A.4, for these Tier 1 departures is addressed by the staff in Section 1.11S.1 to this chapter of the SER. The technical evaluation of all Tier 1 departures against the NRC's safety regulations is part of the evaluation in the applicable chapter review.

- STD DEP T1 2.14-1 Hydrogen Recombiner Requirements Elimination

With respect to this section of the FSAR, the applicant has identified that Departure STD DEP T1 2.14-1 results in a needed modification to DCD Tier 2 Table 1.7-1 and the modified portion of the table has been included in this section of the applicant's FSAR. Within the review scope of this section, the staff determined this departure to be editorial in nature and, therefore, finds it acceptable.

- STD DEP T1 3.4-1 Safety-Related I&C Architecture

With respect to this section of the FSAR, the applicant has identified that Departure STD DEP T1 3.4-1 results in needed modifications to DCD Tier 2 Table 1.7-5 and the modified portion of the table has been included in this section of the applicant's FSAR. Within the review scope of this section, the staff determined this departure to be editorial in nature and finds it acceptable.

COL License Information Item

- COL License Information Item 1.2 P&ID Pipe Schedule

This COL license information item directs the applicant to complete specific P&ID pipe schedules. The staff agreed that the applicant has provided this information in Subsection 1.7.6.1 of the FSAR. To the extent that the technical information in that section needs to be evaluated, the evaluation is in the appropriate chapter of this SER.

Supplemental Information

In FSAR Section 1.7, the applicant includes Table 1.7-6 which contains a list of I&C and electrical drawings that are not part of the DCD. Each drawing is associated with a particular chapter in the FSAR. The information in these drawings is addressed, as necessary, in the technical evaluation of the individual chapters.

The applicant also includes Table 1.7-7 which contains a list of system drawings not included in the certified ABWR DCD. Each drawing is associated with a particular chapter in the FSAR. The information in these drawings is addressed, as necessary, in the technical evaluation of the individual chapters.

### 1.7.5 Post Combined License Activities

There are no post COL activities related to this section.

### 1.7.6 Conclusion

The NRC staff's finding related to information incorporated by reference is in NUREG–1503. NRC staff reviewed the application and checked the referenced DCD. The staff's review confirmed that the applicant has addressed the required information, and no outstanding information is expected to be addressed in the COL FSAR related to this section. Pursuant to 10 CFR 52.63(a)(5) and 10 CFR Part 52 Appendix A Section VI.B.1, all nuclear safety issues relating to drawings and other detailed information that were incorporated by reference have been resolved.

In addition, the staff concluded that the relevant information in the COL application is acceptable, satisfies NRC regulations, and meets the requirements defined in the ABWR DCD and 10 CFR Part 52, Appendix A. The staff's conclusion is based on the following:

- The staff reviewed the proposed Tier 1 departures with respect to Commission rules and regulations. For the purpose of the staff's Section 1.7 review, the staff determined that these departures are consistent with Commission rules and regulations and have no adverse impact on public health and safety.

- Within the review scope of this section, the staff's review confirmed that the applicant has adequately addressed COL License Information Item 1.2 in accordance with Section 1.0 of NUREG–0800.

- The staff's review confirmed that the applicant has adequately addressed the supplemental information in accordance with Section 1.0 of NUREG–0800.

## 1.8 Conformance with Standard Review Plan and Applicability of Codes and Standards

### 1.8.1 Introduction

This FSAR section addresses the requirement of 10 CFR 52.79(a)(41) that COL applicants referencing a certified design should provide an evaluation of conformance to the guidance in the NRC SRP that was in effect 6 months before the docket date of the COL application for the site-specific portions of the facility design that are not included in the referenced certified design. This section also addresses the applicability of codes, standards, and RGs.

The applicant has added a new section titled, "Site Parameters, Interface Requirements, COL License Information Items, and Conceptual Design Information," to supplement Section 1.8 of the FSAR and to conform with the guidance in RG 1.206. This new section is designated as Section 1.8S. Section 1.8S identifies the FSAR chapters where site parameters, interface requirements, COL license information items, and replacement conceptual design information (CDI) are addressed.

### 1.8.2 Summary of Application

Section 1.8 of the STP Units 3 and 4 COL FSAR Revision 12 incorporates by reference Section 1.8 of the certified ABWR DCD Revision 4. Section 1.8 also incorporates by reference the STPNOC AIA Amendment. The applicant supplements Section 1.8 with Section 1.8S, providing supplemental information on conformance with the site parameters, interface requirements, COL license information items, and conceptual design information.

In addition, in FSAR Sections 1.8 and 1.8S, the applicant provides the following:

<u>Tier 1 Departure</u>

- STD DEP T1 2.14-1 — Hydrogen Recombiner Requirements Elimination

The applicant modifies Table 1.8-20 by revising the applicable version of RG 1.7, "Control of Combustible Gas Concentration in Containment," to Revision 3.

- STD DEP T1 2.15-1 — Reclassification of RWB Substructure from Seismic Category I to Non-Seismic

The applicant modifies Table 1.8-20 to include RG 1.43, "Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light-Water-Cooled Nuclear Power Plants," Revision 2.

<u>Tier 2* Departure</u>

- STD DEP 1.8-1 — Tier 2* Codes, Standards, and Regulatory Guide Edition Change

The applicant updates entries in Tables 1.8-7, 1.8-20, and 1.8-21 to reflect the affected changes in codes, standards, and RGs in the ABWR DCD.

<u>Tier 2 Departures Not Requiring Prior NRC Approval</u>

- STD DEP 5A-1 — Deletes Appendix on Compliance with Regulatory Guide 1.150

The applicant updates Table 1.8-20 by deleting RG 1.150, "Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations." This test is performed in accordance with American Society of Mechanical Engineers (ASME) Section XI Appendix VIII, as required by 10 CFR 50.55a.

- STD DEP 6C-1 — Containment Debris Protection for ECCS Strainers

This departure identifies the ECCS strainer design for preventing debris from clogging the strainers during long-term recirculation cooling, following the loss-of-coolant accident (updates Table 1.8-20 for RG 1.82 Revision 3, "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident").

- STD DEP 9.1-1 Update of Fuel Storage and Handling Equipment

This departure updates the entry in Table 1.8-21a for codes and standards related to the construction of an overhead and gantry crane.

- STP DEP 9.5-1 Diesel Generator Jacket Cooling Water System

The departure withdraws RG 1.108, “Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants,” and replaces it with RG 1.9, Revision 3, ”Application and Testing of Safety-Related Diesel Generators in Nuclear Power Plants,” in Table 1.8-20.

- STD DEP 11.2-1 Liquid Radwaste Process Equipment

This departure updates the entry for RG 1.143, ”Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light-Water-Cooled Nuclear Power Plants,” to Revision 2 in Table 1.8-20 and completely replaces Section 11.2 of the ABWR DCD.

- STD DEP 11.4-1 Radioactive Solid Radwaste Update

This departure updates the entry for RG 1.143, ”Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light-Water-Cooled Nuclear Power Plants,” to Revision 2 in Table 1.8-20 and completely replaces Section 11.4 of the ABWR DCD.

Supplemental Information

Section 1.8 of the STP Units 3 and 4 FSAR includes the following revisions to the RGs in Table 1.8-20, which reflect the changes to DCD Table 1.8-20 resulting from various departures and conformance to RG 1.206:

- RG 1.75, Revision 3, “Physical Independence of Electric Systems,”
- RG 1.82, Revision 3,
- RG 1.84, Revision 33, “Design, Fabrication, and Materials Code Case Acceptability, ASME Section III,”
- RG 1.136, Revision 3, “Design Limits, Loading Combinations, Materials, Construction, and Testing of Concrete Containments,”
- RG 1.142, Revision 2, “Safety-Related Concrete Structures for Nuclear Power Plants (Other than Reactor Vessels and Containments)”
- RG 1.143, Revision 2,
- RG 1.153, Revision 1, “Criteria for Safety Systems (12/85),” and
- RG 1.85 has been withdrawn

Similarly, the departures and conformance to RG 1.206 result in revisions to Table 1.8-21 providing the following Codes and Standards:

- American Concrete Institute ACI 349–1997,
- ASME Boiler & Pressure Vessel Code, Section III, Division 2, 2001 Edition with 2003 Addenda,
- Military (MIL) STD 461E–1999,
- MIL STD 462E–1999,
- Institute of Electrical and Electronic Engineers (IEEE) Standard (Std) 279–1971, has been replaced by IEEE Std 603–1991,
- IEEE Std 384–1992,
- IEEE Std 603–1991,
- MIL STD 1478–1991, has been cancelled by the U.S. Department of Defense,
- International Building Code, 2006, and
- IEEE Std 665–1995

Section 1.8S, includes Table 1.8S-1, which cross-references FSAR sections that demonstrate conformance to each of the site parameters. Table1.8S-2 cross-references FSAR sections that describe conformance to the interface requirements. Table 1.8S-3 identifies the FSAR sections that replace the conceptual design information and address the impact of any differences between the conceptual and site-specific designs.

### 1.8.3 Regulatory Basis

The regulatory basis of the information incorporated by reference is in NUREG–1503. The regulatory basis of the AIA Amendment information incorporated by reference is in NUREG–1948 dated October 2010. In addition, the relevant requirements of the Commission regulations for the review of FSAR Sections 1.8 and 1.8S, and the associated acceptance criteria, are in Section 1.0 of NUREG–0800.

In accordance with Section VIII of Appendix A to Part 52, the applicant identifies Tier 1, Tier 2*, and Tier 2 departures. Tier 1 and Tier 2* departures require prior NRC approval and are subject to the requirements of 10 CFR Part 52 Appendix A, Sections VIII.A.4, and VIII.B.6, respectively. Tier 2 departures that do not require prior NRC approval are subject to the requirements of 10 CFR Part 52 Appendix A Section VIII.B.5, which are similar to the requirements in 10 CFR 50.59.

### 1.8.4 Technical Evaluation

As documented in NUREG–1503 and NUREG–1948, NRC staff reviewed and approved Section 1.8 of the certified ABWR DCD. The staff reviewed Section 1.8 of the STP Units 3 and 4 COL FSAR and checked the referenced ABWR DCD and AIA Amendment to ensure that the combination of the information in the COL FSAR and the information in the ABWR DCD and AIA Amendment appropriately represents the complete scope of information relating to this review topic.[14] In addition, the staff also reviewed Section 1.8S to ensure that the applicant has provided the required information consistent with the guidance of RG 1.206, Regulatory Positions C.I.1.8 and C.III.1.9. The staff's review confirmed that the information in the application and the information incorporated by reference address the required information relating to conformance with the SRP and the applicability of codes and standards.

In addition, FSAR Sections 1.8 and 1.8S reflect information that may receive additional technical evaluations within the appropriate chapters of this SER.

The staff reviewed the following information in the COL FSAR:

Tier 1 Departure

The following Tier 1 departures identified by the applicant in this section require prior NRC approval in the form of an exemption and the full scope of their technical impact may be evaluated in the other sections of this SER. For more information, refer to COL application Part 7, Section 5.0 for a listing of all FSAR sections affected by these Tier 1 departures. In addition, compliance with 10 CFR Part 52 Appendix A Section VIII.A.4, for these Tier 1 departures is addressed by the staff in Section 1.11S.1 of this Chapter.

- STD DEP T1 2.14-1 — Hydrogen Recombiner Requirements Elimination

With respect to this section of the FSAR, the applicant has identified that Departure STD DEP T1 2.14-1 results in a revision to Table 1.8-20 that updates the version of RG 1.7 in the ABWR DCD. Within the review scope of this section, the staff found that this departure is editorial in nature and is therefore acceptable.

Tier 2* Departure

The following Tier 2* departure identified by the applicant in this section requires prior NRC approval and the full scope of its technical impact may be evaluated in the other sections of this SER. For more information, refer to COL application Part 7, Section 5.0 for a listing of all FSAR sections affected by this departure.

- STD DEP 1.8-1 — Tier 2* Codes, Standards, and Regulatory Guide Edition Change

With respect to this section of the FSAR, the applicant has identified that Departure STD DEP 1.8-1 results in revisions to Tables 1.8-7, 1.8-20 and 1.8-21 that reflect the affected changes in codes, standards, and RGs in the ABWR DCD. Within the review scope of this section, the staff found that this departure is editorial in nature and is therefore acceptable.

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[14] See *"Finality of Referenced NRC Approvals"* in SER Section 1.1.3, for a discussion on the staff's review related to verification of the scope of information to be included in a COL application that references a design certification.

Tier 2 Departures Not Requiring Prior NRC Approval

The following Tier 2 Departures not requiring NRC approval identified by the applicant in this section may also be evaluated in other sections of this SER. For more information, refer to COL application Part 07, Section 5.0 for a listing of all FSAR sections affected by these departures.

- STD DEP 5A-1 Deletes Appendix on Compliance with Regulatory Guide 1.150
- STD DEP 6C-1 Containment Debris Protection for ECCS Strainers
- STD DEP 9.1-1 Update of Fuel Storage and Handling Equipment
- STD DEP 9.5-1 Diesel Generator Jacket Cooling Water System
- STD DEP 11.2-1 Liquid Radwaste Process Equipment

The applicant's evaluation in accordance with 10 CFR Part 52 Appendix A Section VIII.B.5, determined that these departures do not require prior NRC approval. Within the review scope of this section, the staff found it reasonable that these departures do not require prior NRC approval. In addition, the applicant's process for evaluating departures and other changes to the DCD is subject to NRC inspections.

Supplemental information

Section 1.8 of the STP Units 3 and 4 FSAR includes additional editorial revisions to ABWR DCD Table 1.8-20, which update the revisions of RGs as a result of various departures and conformance to RG 1.206. Within the review scope of this section, the staff found that these supplemental changes are editorial in nature and are acceptable. The adherence to the correct revision of the applicable RGs is addressed by the staff, as necessary, in the appropriate technical review section of this SER.

FSAR Section 1.8 also includes additional editorial revisions to the ABWR DCD Table 1.8-21, which update the revisions and applicable Codes and Standards. Within the review scope of this section, the staff found that these supplemental changes are editorial in nature and are acceptable. The adherence to the correct Codes and Standards is addressed by the staff, as necessary, in the appropriate technical review section of this SER.

In addition, FSAR Section 1.8 includes a supplemental Table 1.8-21a. This table is described as a site specific supplement to ABWR DCD Table 1.8-21. Table 1.8-21a identifies "Codes and Standards for Site-Specific Systems." Within the review scope of this section, the staff found that this table is editorial in nature and is acceptable. The adherence to the correct Codes and Standards for Site-Specific Systems is addressed by the staff, as necessary, in the appropriate technical review section of this SER.

FSAR Section 1.8S includes Tables 1.8S-1, 1.8S-2 and 1.8S-3, which cross reference to the FSAR sections where site-specific parameters, interface requirements, COL license information items, and replacement conceptual design information are discussed. Within the review scope of this section, the staff found that these tables are editorial in nature and are therefore acceptable. These cross references to the FSAR are addressed by the staff, as necessary, in the appropriate technical review section of this SER.

Site-Parameters

The applicant includes Supplemental Section 1.8S.1 and Table 1.8S-1, which present information regarding the conformance of the STP Units 3 and 4 site with the ABWR DCD site-parameters. Within the review scope of this section, the staff found that this supplemental section is acceptable. The conformance of the STP 3 and 4 site with site parameters is evaluated in Chapter 2.0 of this SER.

Interface Requirements

The applicant included Supplemental Section 1.8S.2 and Table 1.8S-2, which present information regarding conformance of STP Units 3 and 4 to the interface requirements for completing site-specific designs for the facility. Within the review scope of this section, the staff found that this supplemental section is acceptable. The staff's review found the applicant correctly cross-references the FSAR sections in which conformance to the interface requirements is described.

COL License Information Item

The applicant includes Supplemental Section 1.8S.3, which indicates that the list of the ABWR COL license information items is in Section 1.9 of Tier 2 of the referenced ABWR DCD. Table 1.9-1 in Section 1.9 of the DCD Tier 2 provides a cross-reference to the FSAR sections in which these COL license information items are addressed. The staff's review found this information acceptable.

Replacement of Conceptual Design Information

The applicant includes Supplemental Section 1.8S.4 and Table 1.8S-3, which presents information regarding replacement of CDI included in the ABWR DCD for certain systems that are outside the scope of the standard design and are site-specific. The FSAR replaces the CDI with a description and evaluation of the site-specific design. Table 1.8S-3 identifies the FSAR sections that replace the CDI. These sections address the impact of any differences between the conceptual and site-specific design on the standard design and the design probabilistic risk assessment. Within the review scope of this section, the staff found that this supplemental section is acceptable. The replacement of CDI is addressed by the staff, as necessary, in the appropriate technical review section of this SER.

### 1.8.5 Post Combined License Activities

There are no post COL activities related to this section.

### 1.8.6 Conclusion

The NRC staff's finding related to information incorporated by reference is in NUREG–1503 and NUREG–1948. NRC staff reviewed the application and checked the referenced DCD and AIA Amendment. The staff's review confirmed that the applicant has addressed the required information, and no outstanding information is expected to be addressed in the COL FSAR related to this section. Pursuant to 10 CFR 52.63(a)(5) and 10 CFR Part 52 Appendix A Section VI.B.1, all nuclear safety issues relating to “Conformance with Standard Review Plan and Applicability of Codes and Standards” that were incorporated by reference have been resolved.

In addition, the staff concluded that the relevant information in the COL application is acceptable, satisfies NRC regulations, and meets the requirements defined in the ABWR DCD and 10 CFR Part 52, Appendix A. The staff’s conclusion is based on the following:

- The staff reviewed the proposed Tier 1 departures with respect to Commission rules and regulations. For the purpose of the staff’s Section 1.8 review, the staff determined that these departures are consistent with Commission rules and regulations and have no adverse impact on public health and safety.

- For the purposes of the staff’s Section 1.8 review, the staff found that the “Tier 2* departure” identified by the applicant has no adverse impact on public health and safety and is consistent with NRC rules and regulations.

- For the purposes of the staff’s Section 1.8 review, the staff found that for all of the “Tier 2 departures not requiring prior NRC approval” identified by the applicant, it is reasonable that they do not require prior NRC approval per 10 CFR Part 52 Appendix A, Section VIII.B.5.

- Within the review scope of this section, the staff’s review confirmed that the applicant has adequately addressed the supplemental information in accordance with Section 1.0, of NUREG–0800 and the supplemental information is consistent with NRC regulations.

## 1.9 COL License Information and 1.9S Conformance with Regulatory Criteria

### 1.9.1 Introduction

Section 1.9, “COL License Information,” of the FSAR references Section 1.9 of the ABWR DCD for the list of COL license information items. The applicant adds a new section titled, “Conformance with Regulatory Criteria” to Supplement Section 1.9 of the FSAR in conformance with the guidance of RG 1.206. This new section of the FSAR is designated as 1.9S and addresses applicable RGs, the SRP, generic issues (GIs), and operational experience (Generic Communications).

The COL applicant in accordance with 10 CFR 52.79(a)(41), must address conformance with the SRP sections that were in effect 6 months before the docket date of the COL application for the site-specific portions of the facility design that are not included in the referenced certified design. The evaluation required by 10 CFR 52.79(a)(41) includes an identification and description of all differences in design features, analytical techniques, and procedural measures proposed for a facility and those corresponding features, techniques, and measures given in the SRP acceptance criteria. Where a difference exists, the evaluation shall discuss how the proposed alternative provides an acceptable method of complying with the Commission’s regulations, or portions thereof, that underlie the corresponding SRP acceptance criteria.

According to RG 1.206, COL applicants should provide an evaluation of conformance with the guidance in RGs in effect 6 months before the submittal date of the COL application for the site-specific portions of the facility design that are not included in the referenced certified design. That evaluation also includes an identification and description of departures from the guidance in the RGs as well as acceptable justifications for any alternative approaches proposed.

The COL application, in accordance with 10 CFR 52.79(a)(20), must provide proposed resolutions to applicable unresolved safety issues and medium- and high priority generic safety issues identified in the version of NUREG–0933, “Resolution of Generic Safety Issues (Formerly entitled ‘A prioritization of Generic Safety Issues’),” that is current on the date up to 6 months before the docket date of the application and which are technically relevant to the design, for the site-specific portions of the facility design that are not included in the referenced certified design. The COL application should address how these issues pertain to operational aspects of the facility.

The COL application, in accordance with 10 CFR 52.79(a)(37), must provide the information necessary to demonstrate how operating experience insights have been incorporated into the plant design. According to RG 1.206, the COL application should address this requirement by describing how operating experience insights from generic letters and bulletins issued after the most recent revision of the applicable SRP and 6 months before the docket date of the application, or comparable international operating experience, have been incorporated into the plant design, for the site specific portions of the facility design that are not included in the referenced certified design.

### 1.9.2 Summary of Application

Section 1.9 of the STP Units 3 and 4 COL FSAR Revision 12 incorporates by reference Section 1.9 of the certified ABWR DCD Revision 4. Section 1.9S is a new supplemental information addressing applicable RGs, the SRP, GIs, and operational experience (Generic Communications).

In addition, in FSAR Sections 1.9, and 1.9S, the applicant provides the following:

<u>Tier 1 Departure</u>

- STD DEP T1 3.4-1 Safety-Related I&C Architecture

This departure revises the safety-related I&C architecture. The applicant modifies the title of the COL License Information Item 19.8 in Table 1.9-1 of the ABWR DCD to be consistent with the new naming convention in the revised I&C architecture.

<u>Supplemental Information</u>

Section 1.9S, provides supplemental information to address applicable RGs, SRP, GIs, and operational experience. FSAR Table 1.9S-1 lists the applicable Division 1 and Division 8 RGs that were in effect in March 2007, which STP Units 3 and 4 conform to for the site-specific portions of the facility design not included in the referenced ABWR DCD. The operational aspects of the facility are also included. Table 1.9S-1 also includes those RGs with which the departures from the referenced ABWR DCD conform. Table 1.9S-2 lists an evaluation of the exceptions from the RGs, which are noted as “COL Applicant” in the DCD. Table 1.9S-3 addresses conformance to the March 2007

SRP for the site-specific portions of the facility design. Table 1.9S-4 addresses conformance to the March 2007 SRP for the Tier 1 and Tier 2* departures. The applicant consistent with the guidance in RG 1.206, addresses conformance with the March 2007 SRP for the Tier 1 and Tier 2* departures and for the site specific portions of the facility design that were not included in the reference ABWR DCD. Table 1.9S-5 addresses GIs identified in Table 19B of the referenced ABWR DCD as the responsibility of the COL applicant. Table 1.9S-6 addresses those generic communications (Generic Letters and Bulletins) identified in the referenced ABWR DCD Table 1.8.22 as the responsibility of the COL applicant.

### 1.9.3 Regulatory Basis

The regulatory basis of the information incorporated by reference is in NUREG–1503. In addition, the relevant requirements of the Commission regulations for the review of FSAR Sections 1.9 and 1.9S, and the associated acceptance criteria, are in Section 1.0 of NUREG–0800.

In accordance with Section VIII of Appendix A to Part 52, the applicant identifies one Tier 1 departure. This departure requires prior NRC approval and is subject to the requirements of 10 CFR Part 52, Appendix A, Section VIII.A.4.

### 1.9.4 Technical Evaluation

As documented in NUREG–1503, NRC staff reviewed and approved Section 1.9 of the certified ABWR DCD. The staff reviewed Section 1.9 of the STP Units 3 and 4 COL FSAR and checked the referenced ABWR DCD to ensure that the combination of the information in the COL FSAR and the information in the ABWR DCD appropriately represents the complete scope of information relating to this review topic.[15] The staff also reviewed Section 1.9S to ensure that the applicant has provided the required information consistent with the guidance of RG 1.206, Regulatory Positions Part III and C.I.1.9. The staff's review confirmed that the information in the application and the information incorporated by reference address the required information relating to COL license information and conformance with regulatory criteria.

In addition, FSAR Sections 1.9 and 1.9S reflect information that may receive additional technical evaluations within the appropriate chapters of this SER.

The staff reviewed the following information in the COL FSAR:

<u>Tier 1 Departure</u>

The following Tier 1 departure identified by the applicant in this section requires prior NRC approval in the form of an exemption and the full scope of its technical impact may be evaluated in the other sections of this SER. For more information, refer to COL application Part 07, Section 5.0 for a listing of all FSAR sections affected by this Tier 1 departure. In addition, compliance with 10 CFR Part 52 Appendix A Section VIII.A.4, for this Tier 1 departure is addressed by the staff in Section 1.11S.1 of to this chapter.

[15] See *"Finality of Referenced NRC Approvals"* in SER Section 1.1.3, for a discussion on the staff's review related to verification of the scope of information to be included in a COL application that references a design certification.

- STD DEP T1 3.4-1 Safety-Related I&C Architecture

With respect to this section of the FSAR, the applicant has identified that Departure STD DEP T1 3.4-1 results in a revision to COL License Information Item 19.8 in Table 1.9-1 of the ABWR DCD to be consistent with the new naming convention in the revised I&C architecture. Within the review scope of this section, the staff found that this departure is editorial in nature and is acceptable.

Supplemental Information

Consistent with 10 CFR 52.79(a) and the guidance in RG 1.206, FSAR Section 1.9S, provides supplemental information addressing applicable RGs, SRP, GIs, and operational experience.

The staff reviewed Table 1.9S-1, "Site-Specific Conformance with Regulatory Guides," in order to confirm that it lists Division 1 and Division 8 RGs and uses the correct RG revisions. Additionally, the staff reviewed the list of RGs in Table 1.9S-2 annotated as "COL Applicant" in the referenced ABWR DCD Table 1.8-20. The staff noted that the applicant's FSAR did not address RGs related to quality assurance. The staff issued RAI 01-14 and the applicant responded by letter dated October 29, 2009 (ML093430301). The staff found that the applicant's response was insufficient. This issue was tracked as Open Item 01-8 in the SER with open items. As a follow-up to RAI 01-14, the staff issued RAI 17.5-9 requesting the applicant to clarify the inconsistencies between FSAR Table 1.9S and Part IV of the QAPD. The applicant's response to RAI 17.5-9, dated March 17, 2010 (ML100770388), includes proposed revisions to FSAR Tables 1.9S-1 and 1.9S-2, which reference Part IV of the QAPD to address conformance. The evaluation of this RAI is in Section 17.5 of this SER. Therefore, Open Item 01-8 is closed.

Consistent with RG 1.206, the applicant notes that the only applicable medium-or high priority generic issue listed in NUREG–0933, Appendix B, Rev. 21, dated June 30, 2006, is Generic Issue 156.6.1 regarding "Pipe Break Effects on Systems and Components." The site-specific portions of the STP Units 3 and 4 design that are not included in the referenced ABWR DCD meet the criteria of SRP Section 3.6.1 Revision 3 and SRP Section 3.6.2 Revision 2 (dated March 2007), which address this issue. The staff found this evaluation reasonable and sufficient.

The staff reviewed FSAR Table 1.9S-4 and found that the applicant consistent with the guidance in RG 1.206 has addressed conformance with the March 2007 SRP for the Tier 1 and Tier 2* departures and for the site specific portions of the facility design that were not included in the referenced ABWR DCD. However, the staff's review found three SRP sections in Table 1.8-19 of DCD Tier 2 that are listed as the responsibility of the COL applicant but were not included in Table 1.9S-3 or in Table 1.9S-4, which indicates nonconformance to the SRP. These sections are SRP Section 9.5.2, "Communication Systems"; SRP Section 13.5.2, "Operating and Maintenance Procedures"; and SRP Section 17.2, "Quality Assurance During the Operations Phase." The staff issued RAI 01-13 requesting the applicant to reconcile these apparent omissions. The applicant's response to RAI 01-13 dated October 15, 2009 (ML092920179), stated that COL FSAR Table 1.9S-4 would be updated to eliminate these omissions. The staff found this response acceptable. However, the staff noted that this table did not address Tier 2 departures requiring prior NRC approval. This issue was tracked as Open Item 01-9 in the SER with open items. In the letter dated June 10, 2010 (ML101650104), the applicant provided revised Table 1.9S-4, which includes the missing Tier 2 departure that requires prior NRC approval. The staff confirmed that Revision 4 of the FSAR was revised as stated in the June 10, 2010 letter. Therefore, Open Item 01-9 is closed and RAI 01-13 is resolved and closed.

The staff reviewed the resolution comments included in Table 1.9S-5 and found that they reasonably and adequately address the GIs identified as the responsibility of the COL applicant in Table 19B of the referenced ABWR DCD.

The staff also reviewed Table 1.9S-6, "COL Applicant Resolution of Generic Communication Issues." The staff found that the applicant has adequately addressed all relevant Generic Letters and Inspection and Enforcement Bulletins.

Based on the above, The NRC staff's review found the applicant has provided sufficient information in Section 1.9S for conformance with RG 1.206.

### 1.9.5 Post Combined License Activities

There are no post COL activities related to this section.

### 1.9.6 Conclusion

The NRC staff's finding related to information incorporated by reference is in NUREG–1503. NRC staff reviewed the application and checked the referenced DCD. The staff's review confirmed that the applicant has addressed the required information, and no outstanding information is expected to be addressed in the COL FSAR related to this section. Pursuant to 10 CFR 52.63(a)(5) and 10 CFR Part 52 Appendix A Section VI.B.1, all nuclear safety issues relating to conformance with regulatory criteria that were incorporated by reference have been resolved.

In addition, the staff concluded that the relevant information in the COL application is acceptable, satisfies NRC regulations, and meets the requirements defined in the ABWR DCD, and 10 CFR Part 52, Appendix A. The staff's conclusion is based on the following:

- The staff reviewed the proposed Tier 1 departure with respect to Commission rules and regulations. For the purpose of the staff's Section 1.9 review, the staff determined that this departure is consistent with Commission rules and regulations and has no adverse impact on public health and safety.

- Within the review scope of this section, the staff's review confirmed that the applicant has adequately addressed the supplemental information in FSAR Section 1.9S in accordance with Section 1.0 of NUREG–0800 and the supplemental information is consistent with NRC regulations.

## 1.10S Impact of Construction Activities on Units 1 and 2

The review of this section was tracked as Open Item 01-10 in the SER with open items, pending development of interim staff guidance. The applicant provides an evaluation of the potential hazards to the SSCs important to safety of the operating units, STP Units 1 and 2, resulting from construction activities at STP Units 3 and 4, as well as a description of the managerial and administrative controls to be used to provide assurance that the limiting conditions for operation (LCO) are not exceeded as a result of construction activities, in accordance with 10 CFR 52.79(a)(31). In addition, the applicant provided an assessment of potential impacts of construction of Unit 4 on Unit 3 when Unit 3 is operational.

Construction activities include site exploration, grading, clearing, and installation of drainage and erosion-control measures; boring, drilling, dredging, demolition, and excavating; storage and warehousing of equipment; and construction, erection, and fabrication of new facilities. The applicant provided an assessment of the potential construction activity hazards, the SSCs important to safety for the operating units, the potentially impacted SSCs and LCOs, along with the applicable managerial and administrative controls to be used to provide assurance that LCOs for the operating units are not exceeded as a result of construction activities at the multi-unit site. On June 10, 2010 (ML101650105), the applicant provided STP Units 3 and 4 Procedure U7-P-EN02-005, "Interface Evaluations of Units 3 and 4 on Units 1 & 2" to demonstrate its compliance with the regulations at 10 CFR 52.79(a)(31) as articulated in the draft DC/COL Interim Staff Guidance (ISG) DC/COL-ISG-022, "Interim Staff Guidance on Impact of Construction of New Nuclear Power Plants on Operating Units at Multi-Unit Sites." In addition, this procedure identifies the managerial and administrative controls and communications between the units to preclude and mitigate the potential impacts to STP Units 1 and 2 SSCs, including; engineering and licensing documents, and environmental, security and the emergency programs.

Based on its review, the staff found that the applicant's Procedure U7-P-EN02-005 is consistent with the program elements of 10 CFR 52.79(a)(31) as expressed in the draft DC/COL-ISG-022 and therefore, is acceptable. (The staff finalized the draft DC/CO-ISG-022 on May 11, 2012.) The applicant satisfies 10 CFR 52.79(a)(31) and Open Item 01-10 is closed.

## 1.11S Exemptions

### 1.11S.1 Exemptions from Tier 1 of the ABWR DCD

#### 1.11S.1.1 Introduction

The STP COL application contains numerous applicant-proposed departures from the ABWR certified design. This section has been added to the SER in order to address the exemption evaluations pertaining to the applicant's proposed Tier 1 departures from the ABWR certified design. This section does not exist in the ABWR DCD or COL FSAR. The safety review of all Tier 1 exemptions is contained throughout the SER. The applicant identified all Tier 1 departures requiring exemptions in Section 2.1 of Part 7 of the COL application Revision 12.

#### 1.11S.1.2 Regulatory Basis

For the ABWR design certification, a departure from Tier 1 information that is proposed by an applicant or licensee referencing the ABWR design is governed by 10 CFR Part 52, Appendix A, which provides:

> Exemptions from Tier 1 information are governed by the requirements in 10 CFR 52.63(b)(1) and 52.98(f). The Commission will deny a request for an exemption from Tier 1, if it finds that the design change will result in a

> significant decrease in the level of safety otherwise provided by the design.

10 CFR Part 52, App. A, Section VIII.A.4. This language provides one criteria and points to two regulations, 10 CFR 52.63(b)(1) and 52.98(f). Section 52.98(f) concerns license amendments. With STP, there is no license to amend because no license has yet been issued. Therefore, section 52.98(f) imposes no additional requirements at this stage. Section 52.63(b)(1), however, sets out the following additional requirements:

> The Commission may grant such a request only if it determines that the exemption will comply with the requirements of § 52.7. In addition to the factors listed in § 52.7, the Commission shall consider whether the special circumstances that § 52.7 requires to be present outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption.

10 CFR 52.63(b)(1). Section 52.63(b)(1) adds a standardization consideration and points to factors listed in 10 CFR 52.7. Section 52.7, however, does not itself list the additional factors but references the exemption standards in 10 CFR 50.12

Accordingly, the Commission may grant the exemption:

1. if the design change will not result in a significant decrease in the level of safety otherwise provided by the design [Source: 10 CFR Part 52, App. A, Section VIII.A.4];

2. if the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security [Source: 10 CFR 50.12(a)(1)];

3. if special circumstances are present [Source: 10 CFR 50.12(a)(2)]. Special circumstances are present whenever:

    i. application of the regulation in the particular circumstances conflicts with other rules or requirements of the Commission; or

    ii. application 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; or

    iii. compliance would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted, or that are significantly in excess of those incurred by others similarly situated; or

    iv. the exemption would result in benefit to the public health and safety that compensates for any decrease in safety that may result from the grant of the exemption; or

    v. the exemption would provide only temporary relief from the applicable regulation and the licensee or applicant has made good faith efforts to comply with the regulation; or

vi. there is present any other material circumstance not considered when the regulation was adopted for which it would be in the public interest to grant an exemption. If this condition is relied on exclusively for showing special circumstances, the exemption may not be granted until the Executive Director for Operations has consulted with the Commission.

4. after considering whether the special circumstances shown under 10 CFR 50.12 outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption [Source: 10 CFR 52.63(b)(1)].

### 1.11S.1.3 Summary of Application

The applicant identified all Tier 1 departures requiring exemptions in Section 2.1 of Part 7 of the COL application Revision 12. A summary of the applicant's description of these Tier 1 departures is as follows.

- STD DEP T1 1.1-1 Definition of As-Built

The applicant states that:

> This requested departure modifies the FSAR, Tier 1, Section 1.1 definition of as-built to clarify that the determination of physical properties of an as-built structure, system, or component may be based on measurements, inspections, or test that occur prior to installation, provided the subsequent fabrication, handling, installation, and testing do not alter the properties. This clarification is not inconsistent with the original Tier 1 definition of as-built; it clarifies that some physical property determinations may be performed prior to the installation of a particular structure, system, or component, providing these properties are not compromised subsequent to the determination. It should reduce the likelihood of misinterpretation regarding adequate physical property determinations when pre-installation measurements, tests, or inspections are performed. The clarification is the same as the definition of as-built proposed by the Staff at a meeting with the industry on December 17, 2009 and as contained in NEI 08-01 (Revision 4, Draft E) "Industry Guidelines for the ITAAC Closure Process Under 10 CFR Part 52," dated February, 2010.

As result of this departure, the applicant modified ABWR DCD Tier 1 Section 1.1.

- STD DEP T1 2.1-2 Reactor Pressure Vessel System RIP Motor Casing Cladding

The applicant states that:

> This requested departure modifies the description of the reactor internal pump (RIP) motor casing to clearly indicate that some portions of the motor casing have cladding. ABWR DCD Tier 1 describes the cladding

> applied to the interior of the RPV and identifies areas of the RPV where there is no cladding. Specifically, DCD Tier 1, Section 2.1.1 states that there is no cladding on the RIP motor casing. The standard ABWR design for installed applications includes stainless steel cladding at two different locations of the casing. The RIP motor casings are clad with stainless steel only in the stretch tube region (up to the motor secondary seal) and around the bottom of the RIP motor casings where they interface with the motor cover closures. The requested departure modifies the DCD Tier 1 RIP motor casing design description to be consistent with the ABWR RIP motor casing design in current use. The design description in the ABWR DCD Tier 2, Section 5.3.3.1.1.1 is also clarified for consistency with Tier 1.

As result of this departure, the applicant modified ABWR DCD Tier 1 Section 2.1 and Tier 2 Section 5.3.

- STD DEP T1 2.2-1 Control Systems Changes to Inputs, Tests, and Hardware

The applicant states that this requested departure modifies the reference ABWR DCD Tier 1 Table 2.2.1 ITAAC Acceptance Criteria for Item 11. The applicant adds that:

> This acceptance criterion was based upon an assumption that in the rod control and information system (RCIS) design implementation each channel of the dual-redundant RCIS controller equipment would receive power from only one associated uninterruptible power supply. However, in the final RCIS design implementation, only the power supply associated with the one non-Class 1E uninterruptible power supply being tested will become inoperable and both of the dual-redundant controller channels remain operational when this testing is conducted. The detailed RCIS design for the dual-redundant controller equipment is implemented such that each channel remains operational as long as either one of the uninterruptible power supplies is operational. There is an associated alarm condition activated when one of the uninterruptible power supplies becomes inoperable (i.e. so the operator becomes aware of this abnormal power supply status condition). A change has been incorporated regarding the DCD Tier 1 ITAAC requirement for the RCIS related to the Acceptance Criteria associated with the testing of one of the dual redundant non-Class 1E uninterruptible power supply at a time.

As result of this departure, the applicant modified ABWR DCD Tier 1 Section 2.2.

- STD DEP T1 2.3-1 Deletion of MSIV Closure and Scram on High Radiation

The applicant states that this requested departure involves the deletion of the Scram and the MSIV automatic closure on high MSLRM (main steamline radiation monitor) trip safety function for the following reasons:

> The MSLR-high trip is not specifically credited in any ABWR safety analysis. This trip was originally designed for BWRs to mitigate the effects

> of a control rod drop accident (CRDA). As described in Tier 2 DCD Section 15.4.10, the ABWR has no basis for the CRDA event to occur. Thus, the deletion of the automatic Scram and MSL isolation results in no change in associated risk or safety margins.
>
> U.S. BWRs have experienced spurious trips due to this function. The radiation trip setpoints can be overwhelmed by minor variations in the N-16 flow during normal operation and cause spurious trips. Elimination of the safety-related functions reduces the potential for unnecessary reactor shutdown and increases plant operational flexibility. Operators in the main control room are alerted to potential offsite releases by the MSLRM, the condenser steam jet air ejector monitor, and/or ventilation stack monitor.

As result of this departure, the applicant modified ABWR DCD Tier 1 Figure 2.3.1 and Table 2.7.1a; as well as Tier 2 information and Technical Specifications.

- STD DEP T1 2.4-1 Residual Heat Removal System and Spent Fuel Pool Cooling

The applicant states that:

> The reference ABWR DCD has two residual heat removal (RHR) loops connected to the Fuel Pool Cooling system with normally closed crosstie valves. During refueling outages, a crosstie valve can be opened to allow direct cooling of the fuel pool by circulation of fuel pool water through the RHR heat exchanger and returning it to the fuel pool. In addition, the RHR pumps have the capability to provide fuel pool emergency makeup water by transferring suppression pool water to the fuel pool. This change is to add the capability to allow the choice of a third loop, RHR division A, in the Augmented Fuel Pool Cooling and Fuel Pool Makeup Modes.
>
> This addition of piping and valves will be of the same quality standard, seismic category, and ASME code as the B and C RHR loops components, along with another capability to provide makeup or cooling to the Spent Fuel Pool. Only one RHR cooling loop will be aligned for the Augmented Fuel Pool Cooling or Fuel Pool Makeup Mode at any one time. The additional loop will increase the reliability from a single failure standpoint. This design change was chosen based on improved reliability and performance.
>
> This change provides the ability to supply fuel pool cooling or makeup from any of the three RHR loops in the Augmented Fuel Pool Cooling or Fuel Pool Makeup Modes. This will enhance capabilities and reliability to perform division outages for maintenance and other activities. Division outages will be better able to be coordinated during all plant operational Modes.

As a result of this departure, the applicant modified ABWR DCD Tier 1 Sections 2.4 and 2.6; as well as Tier 2 information.

- STD DEP T1 2.4-2 Feedwater Line Break Mitigation

The applicant states that:

> This departure reduces challenges to the containment pressure design value following a feedwater line break (FWLB). The corrective design concept is a trip of the condensate pumps following an indication that a Feedwater Line Break (FWLB) in the drywell has occurred.
>
> The FWLB is the limiting design basis accident for ABWR primary containment vessel (PCV) peak pressure response. This is because blowdown flows from both the reactor pressure vessel (RPV) side and the balance of plant (BOP) feedwater side contribute to the peak pressure response.
>
> The departure implementation of condensate pump trip improves plant safety by limiting the mass flow to the drywell after the FWLB, thereby ensuring the predicted peak pressure will not exceed the design value. This is described in Departure STD DEP 6.2-2, Containment Analysis (see Departures from the General Technical Specifications) and Tier 2, Subsection 6.2.1.1.3.3.1. The instrumentation logic to initiate the trip will be an "AND" circuit to reduce the probability of false trips. That is, the logic will require excessive differential pressure between the two-feedwater lines "AND" high drywell pressure to initiate the condensate pump trip. This will reduce the negative impact on plant operation, plant reliability and availability. There would not be an impact on these by adding circuit breakers for the condensate pump supplies, because the logic will only be initiated during FWLB LOCA, the breakers will be normally closed, and additional operator actions will not be required to start the condensate pumps during other events. The design and location of the safety related breakers are described in Tier 2, Subsection 8.3.1.1.1.

As a result of this departure, the applicant modified ABWR DCD Tier 1 Sections 2.4.3 and 2.15; as well as Tier 2 information and Technical Specifications.

- STD DEP T1 2.4-3 RCIC Turbine/Pump

The applicant states that the original DCD reactor core isolation cooling (RCIC) system incorporated a steam turbine driven water pump that has been historically used in the United States with BWR plants. The applicant adds that:

> During the design detailing stage of the ABWR development, another design was chosen based on improved reliability, performance, and simplicity. The new design meets or exceeds all safety related system performance criteria including start time, flow rate, and low steam pressure operation.
>
> The improved design and system simplification is due to (a) monoblock design (pump and turbine within same casing); (b) no shaft seal required; (c) no barometric condenser required; (d) no oil lubrication or oil cooling

system required because the system is totally water lubricated; (e) no steam bypass line required for startup; (f) simpler auxiliary subsystems; and (g) no vacuum pump and associated penetration piping or isolation valves required. The monoblock design is of horizontal, two-stage centrifugal water pump driven by a steam turbine contained in a turbine casing integral with the pump casing. The turbine wheel has a single row of blades. The pump impellers, turbine wheel and inducer are mounted on a common shaft, which is supported on two water lubricated journal bearings. The bearings are housed in a central water chamber between the turbine and pump sections and are lubricated by a supply of water taken from the discharge of the first stage impeller and led to the bearings through a water strainer. This design has been installed and is operational in international nuclear and fossil power plants as well as in maritime and military applications.

As a result of this departure, the applicant modified ABWR DCD Tier 1 Section 2.4; as well as Tier 2 information and Technical Specifications.

- STD DEP T1 2.4-4 RHR, HPCF and RCIC Turbine/Pump NPSH

The applicant states that:

> The original DCD provided a value of 50% for debris blockage of the suction strainers for purposes of assuring adequate net positive suction head (NPSH) margin for testing of the residual heat removal (RHR) system, the high pressure core flooder (HPCF) system, and the reactor core isolation cooling (RCIC) system. This value was based on Regulatory Guide 1.82 Revision 0. The design basis for the suction strainers for STP Units 3 and 4 has been updated to RG 1.82 Rev. 3, which does not use the 50% blockage criterion, but rather provides guidance for mechanistically determining debris head loss across pump suction strainers. The associated ITAAC for the debris blockage of the suction strainers for determination of NPSH margin for the RHR system (Tier 1 Table 2.4.1), HPCF system (Tier 1 Table 2.4.2), and RCIC system (Tier 1 Table 2.4.4) are revised by this departure to be consistent with this updated design basis for the STP Units 3 and 4 suction strainers.
>
> This change makes the ITAAC consistent with the STP Units 3 and 4 suction strainer design and the applicable regulatory guidance. This approach is an improvement in that it uses a mechanistic evaluation for debris blockage and not an assumed value, thus providing a better representation of the debris blockage for purposes of the required NPSH margin determination.

As a result of this departure, the applicant modified ABWR DCD Tier 1 Section 2.4; as well as Tier 2 information.

- STP DEP T1 2.5-1 Elimination of New Fuel Storage Racks from the New Fuel Vault

The applicant states that this departure eliminates the new fuel storage racks from the new fuel vault (NFV). The applicant adds that:

> This site specific change will result in there being only a single design for fuel storage racks, all of which are located in the spent fuel pool (SFP). These racks will store both new and spent fuel assemblies.
>
> The reference ABWR DCD provides for new fuel storage racks in the NFV so that new fuel can be stored in the NFV after receipt inspection and subsequently moved to the SFP before being loaded in the Reactor Pressure Vessel (RPV). New fuel also could be moved directly to the SFP after receipt inspection. At STP Units 3 and 4, new fuel will always be moved directly to the SFP after receipt inspection. This reduces the number of times fuel must be handled before being loaded in the reactor pressure vessel (RPV). By eliminating interim storage in the NFV, the number of fuel handling evolutions is reduced, thereby reducing risk associated with fuel handling. Eliminating the new fuel racks from the design of STP Units 3 and 4 avoids the expense of design, procurement and licensing of a system that will not be used.

As a result of this departure, the applicant modified ABWR DCD Tier 1 Section 2.5; as well as Tier 2 information and Technical Specifications.

- STD DEP T1 2.10-1 Addition of Condensate Booster Pumps

The applicant states that:

> DCD Tier 1 Figure 2.10.2a shows the basic system configuration of the Condensate and Feedwater System (CFS) with a single symbol for condensate pumps. This departure adds a second symbol to the figure to indicate the addition of condensate booster pumps in series. The CFS system is classified as non-safety-related and does not perform a safety function. The location/arrangement of the condensate pumps and condensate booster pumps, between the condenser hotwell and the low pressure heaters, does not adversely impact the ability of the CFS to perform the function described in the Tier 1 Design Description. As part of this departure, DCD Tier 1 Figure 2.10.9, Turbine Gland Seal System, is revised to correct an obvious typographical error.

As a result of this departure, the applicant modified ABWR DCD Tier 1 Section 2.10.

- STD DEP T1 2.12-1 Electrical Breaker/Fuse Coordination and Low Voltage Testing

The applicant states that:

> The reference ABWR DCD in Tier 1 states electrical power distribution interrupting devices (circuit breakers and fuses) are coordinated such that the interrupting device closest to the fault opens first. The description of

the interruption device coordination has been modified to include the acceptable industry practice with standards and codes (e.g., IEEE 141, IEEE 242, etc.). Including this provides detailed guidance for electrical system design expectations. Since protective device coordination may overlap, and the discrete coordination may not be possible, the expectation has been changed to meet the requirement to the maximum extent possible.

The reference ABWR DCD ITAAC also requires that pre-operational/start-up testing of the as-built Class 1E Electrical Power Distribution System will be conducted by operating connected Class 1E loads at their analyzed minimum voltage. DCD Table 2.12.1 (Electric Power Distribution System ITAAC) currently states that tests of the as-built Class 1E Electric Power Distribution System will be conducted by operating connected Class 1E loads at their analyzed minimum voltage. Testing in this manner for each connected Class 1E load is not practical to connect and disconnect each load, one at time to facilitate testing.

For dc loads, ITAAC require testing by operating connected Class 1E loads at both the minimum and maximum battery voltages. Tier 1 DCD Table 2.12.12 (Direct Current Power Supply ITAAC) currently states that tests of the as-built Class 1E dc system will be conducted by operating connected Class 1E loads at less than or equal to the minimum allowable battery voltage and at greater than or equal to the maximum battery charging voltage. It is not practical to perform testing in this manner. This is modified to allow performance type tests at the manufacturer's shop for the operating voltage range of Class 1E ac and dc electrical equipment prior to shipment to the site. In addition, system preoperational tests will be conducted on the as-built Class 1E ac and dc systems and test voltage results will be compare against system voltage analysis.

As a result of this departure, the applicant modified ABWR DCD Tier 1 Section 2.12.

- STD DEP T1 2.12-2 I&C Power Divisions

The applicant states that a fourth division of safety related power has been added to the Class 1E instrument and control (I&C) power supply system. The applicant adds that:

The Instrument and Control Power Supply System as described in the DCD Tier 1 provided power to three mechanical safety-related divisions (I, II and III) and not to safety-related Distributed Control and Information System (DCIS) Division IV. This departure adds a fourth regulating transformer and associated distribution panels to supply Instrument and Control Power to Division IV.

The DCIS cabinets and chassis, ECCS Digital Control and Information System cabinets and chassis, in each of the four divisions, use redundant power supplies and feeds for increased reliability and availability to allow self-diagnostics and to operate during power failures. The existing design provides three divisions such that the two feeds are uninterruptible vital ac power (uninterruptible does not mean single failure proof) and I&C

power (interruptible but diesel-backed). The second I&C power feed is available to the Division IV DCIS cabinets and chassis. Most power problems can be addressed on-line and all such problems will be "non-critical" faults since no functionality will be lost.

As a result of this departure, the applicant modified ABWR DCD Tier 1 Section 2.12; as well as Tier 2 information and Technical Specifications.

- STD DEP T1 2.14-1 Hydrogen Recombiner Requirements Elimination

The applicant states that:

10 CFR 50.44, "Combustible gas control for nuclear power reactors," was amended after the issuance of the design certification for the ABWR. The amended 10 CFR 50.44 eliminates the requirements for hydrogen control systems to mitigate a design basis LOCA hydrogen release. As a result of this change, the use of the containment hydrogen and oxygen monitoring instrumentation in the mitigation of a design-basis LOCA is also eliminated. This change was implemented using the guidance contained within TSTF-447-A, Revision 1, "Elimination of Hydrogen Recombiners and Change to Hydrogen and Oxygen Monitors."

This departure reflects the elimination of the requirement to maintain equipment needed to mitigate a design-basis LOCA hydrogen release. This departure includes the following changes:

(1) The ABWR Flammability Control System (FCS), which consists of two redundant hydrogen recombiners, is no longer required in the response to a design basis LOCA and is eliminated. In conjunction with this change, LCO 3.6.3.1, "Primary Containment Hydrogen Recombiners," which established the requirements for the FCS is deleted. LCO 3.3.6.2, "Remote Shutdown System," is modified to delete Function 17, which required remote shutdown system controls for cooling water to the FCS. Supports systems associated with the FCS are modified or deleted, as necessary, to support removal of the FCS.

(2) The containment hydrogen and oxygen monitoring functions of the Containment Monitoring System are no longer required to function for the mitigation of a design basis LOCA. Consequently, the containment hydrogen and oxygen monitoring functions are no longer classified as Category 1, as defined in Regulatory Guide (RG) 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," Revision 4. The RG 1.97 classification of containment hydrogen and oxygen monitoring functions are changed to Category 3 for hydrogen monitoring, and Category 2 for oxygen monitoring, allowing these instruments to be re-classified as nonsafety-related. In conjunction with this change, LCO 3.3.6.1, "Post Accident Monitoring (PAM) Instrumentation," is modified to delete Functions 11 and 12, requirements for the H2 and O2 analyzers in the containment drywell and wetwell. This change to LCO 3.3.6.1 is

> acceptable because only Category 1 PAM instruments meet 10 CFR 50.36 criteria for inclusion in technical specifications.
>
> With the adoption of these changes, the design and other requirements for control of combustible gases satisfy the regulations in 10 CFR 50.44(c) as amended. The design and requirements for control of combustible gases are consistent with the guidance provided in Regulatory Guide 1.7, Control of Combustible Gas Concentrations in Containment, Revision 3, dated March 2007.

As a result of this departure, the applicant modified ABWR DCD Tier 1 Sections 2.14, 2.15, 2.2, 2.3, 2.4, and Appendix 2.7; as well as Tier 2 information and Technical Specifications.

- STD DEP T1 2.15-1 — Re-classification of Radwaste Building Substructure from Seismic Category 1 to Non-Seismic

The applicant states that:

> The reference ABWR DCD Section 2.15.13 states that the exterior walls of the RW/B below grade and the basemat are classified as Seismic Category I. This departure revises the seismic category of the RW/B substructure (including the Radwaste Tunnels) from Seismic Category I to non-seismic. The RW/B (including the tunnels) does not house any safety related systems or components. Regulatory Guide 1.29, Seismic Design Classification, provides a list of SSCs which have to be classified as Seismic Category I. Item p on Page 4 of the Reg. Guide says "systems, other than radioactive waste management systems, not covered by ---", shall be Seismic Category I. The phrase 'other than radioactive waste management systems' excludes these systems from the list of Seismic Category I SSCs. For the radioactive waste management system, the Reg. Guide 1.29 refers to the Reg. Guide 1.143 in Note 5. The detailed guidance for the design of the radwaste processing systems, structures, and components is provided in Regulatory Guide 1.143. This departure commits to follow the guidance of Regulatory Guide 1.143.
>
> Also, NUREG-1503, Section 3.8.4 states that Radwaste Building is not Seismic Category I. The NRC included this design in their review because GE elected to design the RW/B substructure as Seismic Category I.
>
> Based on this departure, the COLA is revised to delete the description and results of RW/B (including the Radwaste Tunnels) analysis and design from those sections of the COLA which included such description because the RW/B substructure was classified as Seismic Category I structure. Also, revisions have been made throughout the COLA to appropriately change the seismic classification of the RW/B (Part 7, Table 5.0-1).

As a result of this departure, the applicant modified ABWR DCD Tier 1 Section 2.15; as well as Tier 2 information.

- STD DEP T1 2.15-2 RBSRDG HVAC

The applicant states that:

> ABWR DCD Tier 1 Subsection 2.15.5, “Heating, Ventilating and Air Conditioning Systems” describes the operation and setting of the R/B Safety-Related DG HVAC System to control temperature in the diesel generator (DG) engine rooms during DG operation, and states the maximum temperature limit in the room is 50°C. However, based on applying the Ambient Design Temperature for the DG engine rooms (Tier 1 Section 5 specifies a maximum of 46.1°C) and the DG HVAC Flow Rates (Tier 2 Table 9.4.5.8.2 specifies 160,000 m3/h) as defined in other ABWR DCD sections cited, the DG engine room temperature can exceed this 50°C limit. This departure revises the DCD Tier 1 Subsection 2.15.5 DG engine room maximum temperature limit during DG operation from 50°C to 60°C.
>
> ABWR DCD Tier 2 Subsections 9.4.5.4.1.2 and 9.4.5.5.5 describe the R/B Safety-Related Electrical Equipment HVAC System and Diesel Generator HVAC System design bases, respectively, including the maximum design temperature limit of the DG Engine rooms. This change also revises Subsections 9.4.5.4.1.2 and 9.4.5.5.5 to state that the indoor temperature in the diesel generator (DG) engine rooms during DG operation is maintained below 60°C. FSAR Tables 3I-4 and 3I-14 are revised to state that the DG engine rooms maximum temperature is 60°C.

As a result of this departure, the applicant modified ABWR DCD Tier 1 Section 2.15 and Tier 2 information.

- STD DEP T1 3.4-1 Safety-Related I&C Architecture

The applicant identifies the following five primary changes resulting from this departure:

(1) elimination of obsolete data communication technology

(2) elimination of unnecessary inadvertent actuation prevention logic and equipment

(3) clarifications of digital controls nomenclature and systems

(4) final selection of platforms changed the implementation architecture

(5) testing and surveillance changes for safety system logic and control (SSLC)

For more information on the applicant’s description of this extensive departure, see Part 7 Section 2.1 of the applicant’s Departures Report.

As a result of this departure, the applicant modified ABWR DCD Tier 1 Sections 2.2, 2.7, 3.4, 9.5, 9A, and Appendix 9B; as well as Tier 2 information and Technical Specifications.

- STP DEP T1 5.0-1 Site Parameters

The site parameters in the referenced ABWR DCD were selected to bound most potential US sites. However, the applicant stated that when site-specific data are analyzed using current methodologies and standards, the following four specific departures from the generic envelope are needed for the STP Units 3 and 4 site:

- the design-basis flood level is higher than that specified in the DCD
- the maximum design precipitation rate for rainfall is higher than that specified in the DCD
- the humidity as represented by the wet bulb temperature is higher than that specified in the DCD
- the shear wave velocity is lower than that specified in the DCD

As a result of this departure, the applicant modified ABWR DCD Tier 1 Section 5.0; as well as multiple FSAR subsections containing relevant Tier 2 information and Technical Specifications.

### 1.11S.1.4 Technical Evaluation

- STD DEP T1 1.1-1 Definition of As-Built

This Tier 1 departure modifies the Tier 1 Section 1.1 definition of as-built to clarify that the determination of physical properties of an as-built structure, system, or component may be based on measurements, inspections, or tests that take place before installation; provided that subsequent fabrication, handling, installation, and testing do not alter the properties.

The staff has determined that notwithstanding the applicant's characterization of its proposed modification to the definition of "as-built" as a clarification; this is, in fact, a substantive change to the definition of as-built. The staff holds that an "as-built" structure, system, or component is one that is at its final location; therefore, referring to testing performed before a structure, system, or component is at its final location as "as-built" testing does not fall in to the category of a clarification. The staff, however, agrees that the applicant's proposed modification is acceptable because the use of pre-installed measurements, tests, and inspections to determine physical properties is only permissible where it is technically justifiable and where subsequent activities do not alter the physical properties.

The staff compared the Tier 1 definition of "as-built" proposed by the applicant in the COL application to the definition of "as-built" in NEI 08-01, Revision 4 and found no material differences. The staff confirmed that the definition is in accordance with the latest guidance endorsed by the staff. Based on this evaluation, the staff finds this Tier 1 departure acceptable as described in SER Section 14.3.

The staff finds that:

1) the applicant has updated the definition of "as-built" in accordance with revised industry guidance endorsed by the staff; this will continue to

ensure that the as-constructed plant satisfies the acceptance criteria in the ITAAC. Therefore, the exemption will not result in a significant decrease in the level of safety.

2) the changes associated with this requested Tier 1 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. For the reasons stated above, the changes will not present an undue risk to public health and safety. The changes do not otherwise relate to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

3) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present. The underlying intent of the rule is to ensure that certain physical properties of certain structures, systems, or components are determined accurately. In some cases, determining these properties after final installation is not practical. If the physical properties are determined before final installation and these physical properties are not altered before final installation, the underlying purpose of the rule will be met. Therefore, 10 CFR 50.12(a)(2) is satisfied.

4) this departure applies to all COL applicants referencing the ABWR DCD (i.e., it is a standard departure and not a site-specific departure). There are currently no other applicants referencing the ABWR design certification, and the exemption will thus not reduce standardization. Therefore, 10 CFR 52.63(b)(1) is satisfied.

- STD DEP T1 2.1-2 Reactor Pressure Vessel System RIP Motor Casing Cladding

This departure modifies the description of the RIP motor casing to clearly indicate that some portions of the motor casing have cladding. STP Units 3 and 4 COL FSAR Tier 1 Section 2.1.1, “Reactor Pressure Vessel System,” and Tier 2 Subsection 5.3.3.1.1.1, “Reactor Vessel,” state that the RIP motor casings are clad with stainless steel only in the stretch tube region and around the bottom of the RIP motor casings. However, in STP Units 3 and 4 COL application Part 7,“Departures Report,” Section 2.1, under Departure STD DEP T1 2.1-2, the applicant states that the standard ABWR design for installed applications includes stainless steel cladding from the top portion of the casing to the motor secondary seal and around the bottom of the RIP motor casing. The applicant also states that this change represents an improvement based on ABWR operating experience.

The staff evaluated this departure in SER Section 5.3.3. In order to address this departure, the staff requested the applicant to (1) clarify which portions of the motor casing will have cladding; (2) provide the specific operating experience used to justify the design change; and (3) provide details about the material types and procedures used to join the RIP motor casing and the bottom reactor vessel head. The staff finds that the applicant has adequately addressed the staff’s concerns regarding this departure and that this change represents an improvement to the design because the inner surface of the RIP casing, where the cladding is applied, is protected from the potential corrosive environment. Therefore, the departure is acceptable.

The staff finds that:

1) the applicant has provided specific operating experience to justify that the changes in the departure represent an improvement to the design. The staff evaluated the design changes in Section 5.3.3 of this SER and finds them acceptable. Therefore, the exemption will not result in a significant decrease in the level of safety.

2) the changes associated with this requested Tier 1 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes represent an improvement to the design and will not present an undue risk to public health and safety. The changes do not otherwise pertain to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

3) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (iv) is present. Because these changes represent an improvement to the design, they will therefore benefit public health. In addition, the staff finds no decrease in safety from granting the exemption. Therefore, 10 CFR 50.12(a)(2) is satisfied.

4) this departure applies to all COL applicants referencing the ABWR DCD (i.e., it is a standard departure and not a site-specific departure). There are currently no other applicants referencing the ABWR design certification, and the exemption will thus not reduce standardization. Therefore, 10 CFR 52.63(b)(1) is satisfied.

- STD DEP T1 2.2-1 Control Systems Changes to Inputs, Tests and Hardware

This departure modifies ITAAC Table 2.2.1 Item 11 Acceptance Criteria based on the final RCIS design implementation, where the power supply associated with the one non-Class 1E uninterruptible power supply (UPS) being tested will become inoperable, and both dual-redundant controller channels remain operational when this testing is conducted. The staff finds this departure acceptable based on the SER for Chapter 7 and the SER for Section 14.3S.

The applicant stated that the purpose of this departure is to clarify that the ITAAC acceptance criteria are consistent with their final RCIS design implementation. Based on their design implementation of the RCIS, each of the two RCIS channels can be supplied from one power supply when the other power supply is in test mode or inoperable. Therefore, both redundant RCIS channels can be supplied from either power supply. Furthermore, the applicant clarified that the original intent of the ITAAC assumed that the loss of one power supply to the RCIS would result in the loss of one of the redundant RCIS channels. The staff finds this requested departure acceptable because (1) a change to the RCIS UPS design allows both channels of the RCIS to remain operational if either one of the two associated UPS is operational, and (2) the ITAAC was revised to confirm the operability of the RCIS channels when one power supply is inoperable in an alarmed condition. The staff has determined that the design implementation behind this departure represents an enhancement to system reliability because it provides additional flexibility to support continued system operation.

The staff finds that:

1) the design implementation resulting in this departure represents an enhancement to the reliability of the design. This is documented in Chapter 7 and Section 14.3S of this SER. Therefore, the exemption will not significantly decrease the level of safety.

2) the changes associated with this requested Tier 1 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes represent an enhancement to the reliability of the design that will not present an undue risk to public health and safety. The changes do not otherwise pertain to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

3) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (iv) is present. Because these changes represent an enhancement to the reliability of the design, they will therefore benefit public health. In addition, the staff finds no decrease in safety from granting the exemption. Therefore, 10 CFR 50.12(a)(2) is satisfied.

4) this departure applies to all COL applicants referencing the ABWR DCD (i.e., it is a standard departure and not a site-specific departure). There are currently no other applicants referencing the ABWR design certification, and this exemption will thus not reduce standardization. Therefore, 10 CFR 52.63(b)(1) is satisfied.

- STD DEP T1 2.3-1 Deletion of MSIV Closure and Scram on High Radiation

This departure deletes Scram and MSIV automatic closure on the high main steamline radiation monitor (MSLRM) trip and involves changes to Tier 1, Tier 2, and Technical Specifications. With this safety function deleted, the main steamline tunnel area radiation monitoring is no longer required for safety and protection and can be moved from the list of radiation monitors required for safety and protection (Item [1] in FSAR Tier 2 Subsection 11.5.1.1.1) to functions required for plant operation (Item [g] in FSAR Tier 2 Subsection 11.5.1.1.2). In Part 7 Section 2.1, the applicant describes and evaluates this departure per Section VIII.A.4 of Appendix A to 10 CFR Part 52. In summary, the staff found that the MSLRM high trip is not specifically credited in any ABWR safety analysis. This trip was originally designed to mitigate effects in the event of a control rod drop accident for BWRs. The ABWR has no basis for the control rod drop accident event to occur, as described in DCD FSAR Tier 2 Section 15.4.10. Furthermore, the U.S. BWRs have experienced spurious trips due to this MSLRM high trip. The trip setpoint must be set high enough to accommodate the normal high-radiation level during operations from the activated oxygen-16 (O-16) in the reactor leading to radioactive nitrogen-16 (N-16) that is carried in the main steamline flow, but low enough to provide adequate protection. The MSLRM trip setpoints can be overwhelmed by minor variations in the N-16 flow and cause spurious trips. In SER Section 11.5.4, the staff thus found this departure acceptable. This design change represents an improvement in safety by reducing the probability of spurious Scrams, which induce unnecessary challenges to the plant and safety systems. As a result of this departure, plant-specific technical specification (PTS) 3.3.1.1 and the bases were modified to remove the main steam tunnel radiation high functions (automatic Scram and MSIV closure). In addition, PTS 3.3.6.1 and the bases were modified to remove instrumentation monitoring functions for PAM of coolant radiation in the main steamline. A continuous PAM instrument for coolant radiation is no longer required based on Branch Technical Position (BTP) HICB-10, "Guidance on Application of Regulatory Guide 1.97," (Revision 4 of BTP 7-10 dated June 1997 in NUREG–0800, Appendix 7-A) (ML052500542). SER Subsection 16.4.6.1 states that these changes to the PTS are acceptable based on the evaluation of this departure in Section 11.5.4 of this SER. The following Tier 1 information was modified to accommodate this departure:

- ABWR Tier 1 DCD Figure 2.3.1, "Process Radiation Monitoring System Control Interface Diagram" was changed to remove the main steamline tunnel area radiation input from the plant sensors that provide input data.

- Tier 1 Table 2.7.1a was modified to remove the main steam tunnel radiation information from the fixed position alarms, displays, and controls. This information is conveyed through other alarms, displays, and controls in the control room.

The staff finds that:

1) this design change represents an improvement to the design by reducing the probability of spurious scrams that induce unnecessary challenges to the plant and safety systems. The staff's review is documented in Section 11.5.4 of this SER. Therefore, the exemption will not significantly decrease the level of safety.

2) the changes associated with this requested Tier 1 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes represent an improvement to the design that will not present an undue risk to public health and safety. The changes do not otherwise relate to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

3) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (iv) is present. Because these changes represent an improvement to the reliability of the design, the staff finds no decrease in safety from granting the exemption. Therefore, 10 CFR 50.12(a)(2) is satisfied.

4) this departure applies to all COL applicants referencing the ABWR DCD (i.e., it is a standard departure and not a site-specific departure). There are currently no other applicants referencing the ABWR design certification, and this exemption will thus not reduce standardization. Therefore, 10 CFR 52.63(b)(1) is satisfied.

- STD DEP T1 2.4-1 — Residual Heat Removal System and Spent Fuel Pool Cooling Description

In FSAR Subsection 5.4.7.1, "Design Basis," the applicant introduces STD DEP T1 2.4-1, which revises the number of RHR loops connected to the upper pools from two to three to provide additional flexibility in the shutdown cooling flow to the upper pools during normal refueling activities. The purpose of this departure is to improve the capability of performing divisional outages in any order for maintenance and other activities, while maintaining the single-failure margin. In addition, this departure will have the effect of increasing redundancy for fuel pool cooling (FPC) and fuel pool makeup. The change will add the RHR division A loop in the augmented fuel pool cooling (FPC) and fuel pool makeup modes, in addition to divisions B and C. The applicant states that the additional components, such as piping and valves, "will be of the same quality standard, seismic category, and ASME code as the B and C RHR loop components." The applicant also incorporated STD DEP T1 2.4-1 into FSAR Subsections 5.4.7.1.1.8 ("Fuel Pool Cooling") and 5.4.7.2.6 ("Manual Action"); and Figure 5.4-11, "RHR Process Flow Diagram (PFD) (sheets 1 & 2)."

In Tier 1 Section 2.4.1, the RHR was also revised to reflect the new Division A connection to the FPC system. The cross-tie connections are also correctly shown in the Tier-1 revisions of Figures 2.4.1a, b, and c. In ITAAC Table 2.4.1, Item 7 was revised to include the Division A connection. In the evaluation of Chapter 5, "Reactor Coolant System and Connected System," the staff concluded that the proposed change—which includes additional components and operational procedural changes—will not decrease the level of safety. Therefore, the staff finds Departure STD DEP T1 2.4-1 acceptable.

With respect to applying the four exemption criteria to the Tier 1 departure identified above, the staff finds that:

1) the changes represent an improvement to the design by providing an increase in redundancy for FPC and fuel pool makeup; therefore this will result in a benefit to the public health and safety. Therefore, the changes associated with this exemption will not significantly decrease the level of safety.

2) the changes associated with this requested Tier 1 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes represent an improvement to the design that will not present an undue risk to public health and safety. The changes do not otherwise pertain to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

3) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (iv) is present. These changes represent an improvement to the design that benefits the public health and safety and does not result in a decrease in safety. Therefore, 10 CFR 50.12(a)(2) is satisfied.

4) this departure applies to all COL applicants referencing the ABWR DCD (i.e., it is a standard departure and not a site-specific departure). There are currently no other applicants referencing the ABWR design certification, and this exemption will not reduce standardization. Therefore, 10 CFR 52.63(b)(1) is satisfied.

- STD DEP T1 2.4-2 Feedwater Line Break Mitigation

This departure adds differential pressure signals between the two feedwater lines to identify an FWLB in the containment. Additionally, the departure also implements a condensation pump trip, which is activated if the high drywell pressure signal exists in conjunction with the added differential pressure signals between the two feedwater lines.

In SER Section 6.2.2, the staff evaluated the impact of this departure on the maximum containment pressure/temperature and on the suppression pool hydrodynamic loads following a design-basis LOCA (FWLB) inside the containment. The FWLB is the limiting design-basis accident (DBA) for the ABWR containment. The staff found that implementing this departure will reduce the challenges to the containment pressure design value by limiting the release of mass and energy (M&E) into the containment following the FWLB.

As stated in SER Section 7.3.4, this departure adds feedwater line differential pressure instruments to detect a line break in the piping and provides signals to the LDS logic systems. The staff found that the changes in this departure will maintain the same level of plant reliability and performance as described in the certified ABWR DCD, Revision 4. The changes will also provide a better level of plant protection and a net benefit to public health and safety. The staff's evaluation in SER Section 7.3.4 determined that this departure meets the requirements of 10 CFR 50.55a(h) (IEEE Std 603–1991); GDC 13 and 20–24; and RG 1.97 Revision 4, "Criteria for Accident Monitoring Instrumentation for Nuclear Power Plants." Therefore, the staff finds reasonable assurance that this departure is acceptable from the I&C perspective.

This departure also provides supplemental information on the addition of medium voltage, safety-related circuit breakers for the FWLB mitigation. The staff reviewed the changes made to STP Units 3 and 4 FSAR Subsection 8.3.1.1 and asked several RAIs of the applicant. After reviewing the RAI responses, the staff determined in SER Subsection 8.3.1.4 that the addition of the safety-related condensate pump breaker is an enhancement from the DCD design and is acceptable. In addition, the staff found that because the applicant had achieved an acceptable containment response following a FWLB inside the containment, without crediting the automated condensate pump trip, the response eliminates concerns about the potential failure of a safety-related condensate pump breaker and the need for two safety-related breakers. The staff thus finds that the design satisfies the guidance of RG 1.75 and is therefore acceptable.

The departure affects the PTS by adding the following:

- Functions 11.d, "FWLB Mitigation Initiation," and 15, "Feedwater Line Differential Pressure -High," in PTS 3.3.1.1, Table 3.3.1.1-1

- Functions 15a, "FWLB Mitigation Initiation," and 15b, "FWLB Mitigation Device Actuation," in PTS 3.3.1.4, Table 3.3.1.4-1

Appropriate information regarding these functions is also added to the bases for PTS 3.3.1.1 and PTS 3.3.1.4. These changes to the PTS are acceptable based on the evaluation of this departure in Chapter 6 of this SER.

The staff finds that:

1) in Chapters 6, 7, and 8 of this SER, the staff's review finds that the changes represent an improvement to the design by reducing challenges to the containment pressure design value. Therefore, the exemption will not decrease the level of safety.

2) the changes associated with this requested Tier 1 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes represent an improvement to the design that will not present an undue risk to public health and safety. The changes do not relate to security and do not otherwise pertain to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

3) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (iv) is present. These changes represent an improvement to the design that benefits the public health and safety and does not result in a decrease in safety. Therefore, 10 CFR 50.12(a)(2) is satisfied.

4) this departure applies to all COL applicants referencing the ABWR DCD (i.e., it is a standard departure and not a site-specific departure). There are currently no other applicants referencing the ABWR design certification, and this exemption will not reduce standardization. Therefore, 10 CFR 52.63(b)(1) is satisfied.

- STD DEP T1 2.4-3 RCIC Turbine/Pump

In STP Units 3 and 4 FSAR Section 5.4.6, the applicant identifies Tier 1 Departure STD DEP T1 2.4-3. This departure involves the replacement of the RCIC turbine and pump system design with an integrated (monoblock) alternate turbine-pump system design. Tier 1 Section 2.4.4 discusses the departure and the simplification of the RCIC system. The simplifications are the removal of unnecessary components such as the barometric condenser, the vacuum pump, the condensate pump, valves, and associated equipment.

In SER Sections 5.4.6 and 6.3, the staff identified the following changes and findings with respect to Tier 1 Section 2.4.4:

- The barometric condenser was deleted from the RCIC system. This change is acceptable because there is no barometric condenser in the new turbine design.

- In Table 2.4.4, "Reactor Core Isolation Cooling System," Items 3c, 3e, and 3f were revised. The steam supply bypass valve logic description and the 10-second time delay signal were deleted from the acceptance criteria. These changes are acceptable because there is no steam supply bypass valve or 10-second timer with the new turbine design.

- Also in Table 2.4.4, Item 3i was revised. The pump torque was deleted from the acceptance criteria. This change is acceptable because this parameter cannot be directly measured in the integrated turbine/pump configuration.

- In Figure 2.4.4a, “Reactor Core Isolation Cooling System,” the steam supply bypass valve, Note 1, and the class barrier were deleted. The steam supply bypass valve was deleted because there is no steam supply bypass valve with the new turbine design. Hence, this change is acceptable. The deletions of Note 1 and the class barrier from the figure are acceptable because the new turbine will be qualified according to ASME Code Section III.

The departure also affects the PTS and the bases by the following:

- Adding the phrase “and high exhaust pressure equipment” to the RCIC discussion in the “Background” section of the bases for PTS 3.3.1.1 so that the next to the last sentence states, “In addition, turbine overspeed and high exhaust pressure equipment protection signals will trip the turbine.”

- Changing “RCIC Turbine Exhaust Diaphragm Pressure” to "RCIC Turbine Exhaust Pressure" in paragraph number 3, “RCIC System Isolation,” of the discussion of the isolation portion of the SSLC in the “Background” section of the bases for PTS 3.3.1.1.

- Reinstating Function 12.d, “RCIC Turbine Exhaust Pressure – High,” in PTS 3.3.1.4, Table 3.3.1.4-1, “ESF Actuation Instrumentation.”

- Changing “RCIC Turbine Exhaust Diaphragm Pressure” to "RCIC Turbine Exhaust Pressure" in the discussions of “Functions,” 12.a, “RCIC Isolation Initiation”; and 12.d, “RCIC Turbine Exhaust Pressure – High,” in the “Background” section of the bases for PTS 3.3.1.4.

These changes are acceptable based on the evaluation of this departure in Sections 5.4.6 and 6.3 of this SER.

The staff finds that:

1) the changes represent an improvement to the design because the new design is simpler and more reliable. As documented in Sections 5.4.6 and 6.3 of this SER, the staff finds this departure acceptable. Therefore, the exemption will not significantly decrease the level of safety.

2) the changes associated with this requested Tier 1 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes represent an improvement to the design that will not present an undue risk to public health and safety. The changes do not relate to security and do not otherwise pertain to the common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

3) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (iv) is present. Because these changes represent an improvement to the design, the staff finds no decrease in safety from granting the exemption. Therefore, 10 CFR 50.12(a)(2) is satisfied.

4) This departure applies to all COL applicants referencing the ABWR DCD (i.e., it is a standard departure and not a site-specific departure). There are currently no other applicants referencing the ABWR design certification, and this exemption will not reduce standardization. Therefore, 10 CFR 52.63(b)(1) is satisfied.

- STD DEP T1 2.4-4 RHR, HPCF and RCIC Turbine/Pump NPSH

The ITAAC for the RHR, HPCF, and RCIC systems in ABWR DCD Tier 1 Tables 2.4-1, 2.4-2, and 2.4-4 refer to a criterion of 50 percent blockage of pump suction strainers in determining the NPSH margin, as stated in RG 1.82 Revision 1. However, the applicant has committed to design STP Units 3 and 4 to conform with RG 1.82 Revision 3, which does not refer to the criterion of a 50 percent blockage of pump suction strainers but provides guidance for mechanistically determining debris head loss across pump suction strainers. Accordingly, the applicant revised the FSAR in Revision 4 of the STP Units 3 and 4 COL and changed the "50% blocked strainer" criterion to "analytically derived values for blockage of pump suction strainers based upon the as-built system," in accordance with RG 1.82 Revision 3. In SER Section 6.2.1, the staff determined that Departure STD DEP T1 2.4-4 is consistent with the applicant's commitment to design STP Units 3 and 4 to conform with RG 1.82 Revision 3, and the departure is therefore acceptable.

The staff finds that:

1) the applicant has updated the ITAAC in accordance with guidance in RG 1.82, Revision 3, the staff's current position. The change to the ITAAC is simply a change in the way NPSH margin is determined. The revised methodology will not decrease the level of safety because it is consistent with the staff's current guidance.

2) the changes associated with this requested Tier 1 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes represent an improvement to the method of determining NPSH margin that will not present an undue risk to public health and safety. The changes do not relate to security and do not otherwise pertain to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

3) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present. The purpose of the ITAAC is to determine NPSH suction margin. The staff has found that a mechanistic determination of debris head loss across pump suction strainers is an acceptable method of doing so; therefore, the departure achieves the underlying purpose of the rule. Therefore, 10 CFR 50.12(a)(2) is satisfied.

4) this departure applies to all COL applicants referencing the ABWR DCD (i.e., it is a standard departure and not a site-specific departure). There are currently no other applicants referencing the ABWR design certification, and this exemption will not reduce standardization. Therefore, 10 CFR 52.63(b)(1) is satisfied.

- STP DEP T1 2.5-1 Elimination of New Fuel Storage Racks from the New Fuel Vault

This departure removes the new fuel storage racks from the new fuel vault. The new fuel for the STP units will be stored in the spent fuel storage racks following receipt and inspection. The new fuel vault and new fuel storage racks as described in the ABWR DCD will not be used.

In Section 9.1.1.1 of this SER, the staff states that "…spent fuel rack (SFR) criticality analyses are performed with the assumption that all are fresh fuel. In addition, the spent fuel storage racks are identical to the new fuel storage racks and provide the same structural protections. Thus, the criticality analysis and the structural analysis performed for the SFRs are also applicable to the new fuel racks (NFRs). The design requirements described in COL License Information Items 9.1 and 9.2 for the NFRs are satisfied in the design for the SFRs described in Subsections 9.1.2.4.4, "Spent Fuel Storage Racks Criticality Analysis," 9.1.2.4.5, "Spent Fuel Racks Load Drop Analysis," and 9.1.2.4.6, "Spent Fuel Racks Structural Evaluation," of this SER. The staff therefore finds that the departure does not result in a significant decrease in the level of safety otherwise provided by the design."

The scope of changes in the STP Units 3 and 4 FSAR resulting from this departure includes the omission from PTS 4.3.1 of Generic Technical specification (GTS) 4.3.1.2 paragraphs a, b, and c, regarding new fuel storage rack design requirements. The staff's evaluation of the changes to the Technical Specifications resulting from this departure can be found in Subsection 16.4.14.3 of this SER.

The staff finds that:

1) the changes associated with this requested Tier 1 departure will not significantly decrease the level of safety otherwise provided by the design because the spent fuel pool and associated storage racks are designed to meet Category I requirements. There will be no new fuel in the new fuel vault, so not putting racks in the vault has no effect on safety; it will just become an empty vault. The staff further found that for criticality considerations and structural protection, the spent fuel racks are subject to the same analysis as the NFRs. Therefore, the exemption will not significantly decrease the level of safety.

2) the changes associated with this requested Tier 1 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The change will not present an undue risk to public health and safety. The changes do not relate to security and do not otherwise pertain to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

3) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present. As documented in Subsection 9.1.1.1 of this SER, the staff found that the underlying purpose of the Tier 1 information (i.e., providing for the safe storage of new fuel) is still met. Therefore, 10 CFR 50.12(a)(2) is satisfied.

4) this departure is a site-specific departure and is not applicable to all COL applicants referencing the ABWR DCD. As documented in the staff's review, there will be no reduction in the level of safety; so the reduction in standardization is therefore justified.

- STD DEP T1 2.10-1 Addition of Condensate Booster Pumps

The applicant revised the COL application to reflect a new Tier 1 standard departure in FSAR Tier 1, Section 2.10. The applicant identified this departure as STD DEP T1 2.10-1 and revised Tier 2 Table 1.9S, "Conformance with Regulatory Criteria," and Table 19.2-2, "PRA Assessment of STP Departures from ABWR DCD," in support of this change. This departure revises Tier 1 Figure 2.10-2a to now show a basic condensate and feedwater system (CFS) configuration with condensate pumps receiving condensate from the condenser and delivering it to the condensate purification system, and condensate booster pumps receiving condensate from the condensate purification system and delivering it to the low-pressure heaters.

The staff determined that the use of condensate booster pumps does not adversely impact the ability of the CFS to perform its designed function, and the booster pumps will be located outside the containment and are therefore not part of the safety-related portion of the system. The use of condensate booster pumps in the CFS does change the compliance with the SRP guidance, as documented in NUREG–1503.

The staff found that the new CFS design information in Tier 2 of the STP FSAR is no longer consistent with the information regarding the CFS design description and associated ITAAC in Tier 1, Section 2.10.2 of the DCD. In order to fix this discrepancy, the applicant proposed STD DEP T1 2.10-1 to revise Tier1 Figure 2.10-2a, which now shows the CFS configuration with the condensate booster pumps added.

The staff reviewed the applicant's proposed Tier 1 departure and affected changes. The staff determined that the revisions to Tier 1 will eliminate the discrepancy between FSAR Tier 2, Section 10.4.7 and FSAR Tier 1 Section 2.10. The CFS configuration will now be the same in both Tier 1 and Tier 2 sections of the FSAR, and the associate Tier 1 ITAAC in Section 2.10 will now capture the revised CFS design illustrated in the applicant's revised Tier 1 Figure 2.10-2a. The staff evaluated the Tier 2 information associated with this Tier 1 departure and found it acceptable, as described in SER Subsection 10.4.7.4. Based on this evaluation, the staff finds this Tier 1 departure acceptable.

The staff finds that:

1) the changes associated with this requested Tier 1 departure will not significantly decrease the level of safety otherwise provided by the design, because the staff has found that the use of condensate booster pumps will not adversely impact the ability of the CFS to perform its designed function. In addition, the booster pumps will be located outside the containment and are therefore not part of the safety-related portion of

the system. Therefore, the exemption will not result in a decrease in the level of safety.

2) the changes associated with the requested Tier 1 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes represent an improvement to the design that will not present an undue risk to public health and safety. The changes do not relate to security and do not otherwise pertain to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

3) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present and the staff found that the Tier 1 ITAAC is still met with the proposed Tier 1 revision. Therefore, the application of the regulation in this particular circumstance is not necessary to meet the underlying purpose of the rule.

4) this departure applies to all COL applicants referencing the ABWR DCD (i.e., it is a standard departure and not a site-specific departure). There are currently no other applicants referencing the ABWR design certification, and there will be no reduction in standardization. Therefore, 10 CFR 52.63(b)(1) is satisfied.

- STD DEP T1 2.12-1 Electrical Breaker/Fuse Coordination and Low Voltage Testing

In DCD Tier 1 Table 2 12.1 (“Electrical Power Distribution System ITAAC”), Item 22 requires tests of the as-built Class 1E electric power distribution system to be conducted by operating connected Class 1E loads at their analyzed minimum voltage. Additionally, in DCD Tier 1 Table 2.12.12, Item 11 requires tests of the as-built Class 1E direct current (dc) system to be conducted by operating connected Class 1E loads at less than or equal to the minimum allowable battery voltage and at greater than or equal to the maximum battery charging voltage.

The applicant states that it is not practical to perform tests in this manner. The applicant has modified DCD Table 2.12.1 Item 22 and Table 2.12.12 Item 11 to include type tests at the manufacturer’s shop for the operating voltage range (minimum and maximum) of Class 1E alternating current (ac) and dc electrical equipment (Items 22 b and 11b). In addition to the manufacturer’s testing, the applicant will conduct system preoperational and startup tests of each load of the as-built electrical system at the normal operating voltages (Items 22c and 11c). The applicant will compare the minimum analyzed voltages for the equipment against the manufacturer’s operating voltage range test results to ensure that each load can perform its intended safety function at the analyzed minimum voltage condition. The staff found that the combination of the factory, preoperational, and startup tests meets the intent of the test requirements specified in the DCD based on the following:

- Type tests at the manufacturer’s shop are for the minimum and maximum operating voltage range.

- Preoperational and startup tests of the as-built electrical system are at the normal operating voltage.

- Comparisons of the analyzed minimum and maximum voltages for the equipment against the results of the type tests at the manufacturer's shop are at the operating voltage range.

The applicant states that interrupting devices (circuit breakers and fuses) are coordinated so that the interrupting device closest to the fault opens before the other devices. The applicant notes that the expectation was changed to meet the requirements to the maximum extent possible, because protective device coordination may overlap and the discrete coordination may not be possible (see DCD Tier 1 Table 2.12.1; Table 2.12.12; Table 2.12.14, "Vital AC Power Supply"; and Section 2.12.15, "Instrument and Control Power Supply"). The applicant modified the above tables to include "to the maximum extent possible" after the interrupting devices are coordinated. For electrical loads powered at or below 120 VAC or 125 VDC, the requirement that the device closest to the fault open first is not always met. This is because many small loads have integral fuses/circuit breakers that cannot be changed to facilitate coordination with upstream protective devices. Therefore, in those cases of high current faults, the upstream protective device may trip before the integral protective device associated with the small load trips; or both protective devices may trip at the same time. In such cases, discrete coordination may not be possible.

The staff understands that protective device coordination for 120 VAC or 125 VDC may overlap and the discrete coordination may not be possible. However, the staff requested the applicant to justify the acceptability of these instances where adequate coordination cannot be achieved. In response, the applicant stated that the acceptance criteria in Table 2.12.1 (Item 11), Table 2.12.12 (Item 8), Table 2.12.14 (Item 10), and Table 2.12.15 (Item 9) were modified to include "For instances where coordination cannot be practically achieved, the analysis will justify the lack of coordination." The staff finds the applicant's response acceptable.

In SER Section 14.3S, the staff found that the revised ITAAC for the electrical power distribution system and the dc power supply system are consistent with 10 CFR 52.80(a), SRP 14.3.6, and RG 1.206. The staff concluded that the proposed ITAAC will ensure that the system will perform in accordance with its design. Based on this evaluation, the staff finds this Tier 1 departure acceptable.

The staff finds that:

1) the applicant has shown that the proposed ITAAC will ensure that the system will perform in accordance with its design. Therefore, the exemption will not significantly decrease the level of safety.

2) the changes associated with this requested Tier 1 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes will ensure that the system will perform in accordance with its design and will not present an undue risk to public health and safety. The changes do not otherwise pertain to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

3) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present. The staff finds that the applicant's modifications to the rule (i.e., the original intent of the DCD

ITAAC is still met by the revised ITAAC changes) and therefore the application of the regulation in this particular circumstance is not necessary to meet the underlying purpose of the rule. Therefore, 10 CFR 50.12(a)(2) is satisfied.

4) this departure applies to all COL applicants referencing the ABWR DCD (i.e., it is a standard departure and not a site-specific departure). There are currently no other applicants referencing the ABWR design certification, and there will be no reduction in standardization. Therefore, 10 CFR 52.63(b)(1) is satisfied.

- STD DEP T1 2.12-2 I&C Power Divisions

This departure adds a fourth division of safety-related power to the Class 1E I&C power supply system. The staff reviewed the information pertaining to the use of four 120 VAC "Class 1E instrument power systems" rather than the three identified in the corresponding DCD and evaluated this departure in SER Subsection 8.3.1.4. The staff requested the applicant to discuss how the STP logic philosophy differs from the DCD philosophy. The staff also requested the applicant to discuss the utilization difference between the 120 VAC Class 1E power in this subsection and the 120 VAC vital power in Figure 8.3-3 of the ABWR DCD, and the impact of a loss of voltage to the instruments supplied by the "Class 1E instrument power systems" for a period of 10 minutes during an SBO event. In the response, the applicant stated that the subject Class 1E I&C power supplies discussed in this subsection provide interruptible and regulated AC power to Class 1E circuits that do not require a continuity of power during a loss of preferred power. There is thus no impact resulting from a loss of voltage for a period of 10 minutes during an SBO event, because the loads are limited to Class 1E circuits that do not require a continuity of power during a loss of preferred power. Regarding the use of four rather than three divisions, the applicant stated that as described in STD DEP T1 2.12-2, adding a fourth Class 1E I&C power supply increases reliability and availability even though two of the four power supplies are supported by the Division II source. The use of a separate regulating transformer and associated distribution panels for each instrument division improves both reliability and diagnostics, because most instrumentation power problems can be addressed online. Therefore, there is no difference between the applicant’s proposed changes and the DCD with respect to the philosophy and utilization of 120 VAC Class 1E power. The staff finds the applicant’s assessments regarding this departure to be acceptable and finds that the proposed design changes are an improvement from the DCD. Therefore, this Tier 1 departure is acceptable.

This departure revises Table B 3.8.9-1 of the bases for PTS 3.8.9 and lists by identification number the distribution system buses for STP Units 3 and 4, which are consistent with the design of STP Units 3 and 4 (buses with changes are indicated by underlined text). The staff’s review of Table B 3.8.9-1 of the bases for PTS 3.8.9 found that the component and equipment identification used are consistent with the plant-specific design of STP Units 3 and 4 described in Section 8 of the FSAR, and with industry practices. The staff therefore concluded that the component and equipment identification numbers used are acceptable. Based on this evaluation, the staff finds this Tier 1 departure acceptable.

The staff finds that:

1) the changes associated with this requested Tier 1 departure will not significantly decrease the level of safety otherwise provided by the design, because the staff found that the changes proposed by the applicant represent an improvement to the design with respect to enhancing the reliability; availability; and diagnostics of the I&C power supply system. As documented in Subsection 8.3.1.4 of this SER, the staff finds this departure acceptable. Therefore, the exemption will not decrease the level of safety.

2) the changes associated with this requested Tier 1 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes represent an improvement to the design that will not present an undue risk to public health and safety. The changes do not otherwise pertain to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

3) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (iv) is present. These changes represent an improvement to the design and will therefore benefit public health. In addition, the staff finds no decrease in safety from granting the exemption. Therefore, 10 CFR 50.12(a)(2) is satisfied.

4) this departure applies to all COL applicants referencing the ABWR DCD (i.e., it is a standard departure and not a site-specific departure). There are currently no other applicants referencing the ABWR design certification, and there will be no reduction in standardization. Therefore, 10 CFR 52.63(b)(1) is satisfied.

- STD DEP T1 2.14-1 Hydrogen Recombiner Requirements Elimination

This departure is based on 10 CFR 50.44, “Combustible gas control for nuclear power reactors,” which was amended after the issuance of the design certification for the ABWR. The departure reflects the elimination of the requirement to maintain the equipment needed to mitigate a design-basis LOCA hydrogen release. The departure eliminates the ABWR FCS, which consists of two redundant hydrogen recombiners and is no longer required in the response to a design-basis LOCA. Also, the containment hydrogen and oxygen monitoring instruments are no longer classified as Category 1. The ACS establishes and maintains the containment atmosphere to less than 3.5 percent by volume oxygen during normal operating conditions to maintain an inert atmosphere.

The staff reviewed the proposed standard departure in COL application Part 7, with respect to the Commission rules and regulations in SER Section 6.2.5. The applicant’s evaluation of this departure shows that the design complies with the revisions to the regulation for controlling combustible gases added after the issuance of the design certification for the ABWR. The proposed elimination of the hydrogen recombiner requirements of the certified ABWR design is in accordance with 10 CFR 50.44, which was amended after the issuance of the design certification for the ABWR. Because this is a standard departure applicable to all COL applicants referencing the ABWR DCD, no loss of standardization will result from the departure. The staff determined that this standard departure is consistent with Commission rules and regulations and is therefore acceptable.

In SER Section 7.3.4, the staff reviewed the related impacts from this departure on the ESF I&C system and found the departure acceptable from the I&C perspective; because after incorporating these design changes, the ABWR design features and requirements for controlling combustible gases still satisfy regulations in 10 CFR 50.44(c) and are consistent with the guidance in RG 1.7 Revision 3, "Control of Combustible Gas Concentrations in Containment." Based on this evaluation, the changes incorporated by this departure into the PTS and bases are also acceptable.

The staff finds that:

1) the changes associated with this requested Tier 1 departure will not significantly decrease the level of safety otherwise provided by the design, because the staff found that the applicant has updated the design in accordance with revised regulations, which therefore represents an improvement to the design. In Section 6.2.5 of this SER, the staff finds the proposed departure acceptable. Therefore, the exemption will not decrease the level of safety.

2) the changes associated with this requested Tier 1 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes represent an improvement to the design that will not present an undue risk to public health and safety. The changes do not otherwise relate to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

3) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present. Because 10 CFR 50.44(c) does not require hydrogen recombiners, the flammability control equipment originally specified in the DCD is no longer required to meet the underlying purpose of the rule. In addition, the staff finds no decrease in safety from granting the exemption. Therefore, 10 CFR 50.12(a)(2) is satisfied.

4) this departure applies to all COL applicants referencing the ABWR DCD (i.e., it is a standard departure and not a site-specific departure). There are currently no other applicants referencing the ABWR design certification, and there will be no reduction in standardization. Therefore, 10 CFR 52.63(b)(1) is satisfied.

- STD DEP T1 2.15-1 Re-classification of Radwaste Building Substructure from Seismic Category 1 to Non-Seismic

In FSAR Section 3.8.4, the applicant references Departure STD DEP T1 2.15-1 that reclassifies the RWB substructure from seismic Category I to nonseismic and commits to RG 1.143, "Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light-Water-Cooled Nuclear Power Plants," for design of the radwaste processing SSCs.

In Section 3.8.4 of this SER, the staff states that "[f]or earthquake, wind, and tornado loads, the applicant designed the structure for the RW-IIa classification requirements. The calculated stability factors of safety against sliding, overturning, and floating exceed the criteria in SRP Section 3.8.5. Because the applicant provided an ITAAC to ensure that the lateral load resisting system of the RWB is designed to remain elastic under the extreme environmental loads, there is reasonable assurance that the RWB will not adversely impact the RB during such events. Also, the demonstration of the overall stability of the RWB using the guidelines in SRP Section 3.8.5 provides further assurance against the RWB impacting the RB. Based on the review of RAI responses, FSAR and COL application updates, and audit meetings, the staff found that the RWB design meets the SRP criteria and is hence acceptable."

In Section 3.8.4 of this SER the staff concludes that "[b]ased on the above information, the staff concluded that the RWB design meets the design criteria for the RW-IIa classification per RG 1.143, Revision 2."

In Section 12.2.4 of this SER, the staff agreed that the classification of the components in all waste management systems is consistent with the RWB's design as RW-IIa and meets the guidance in RG 1.143, Revision 2, as a result of this departure. Based on the conclusions in these two sections of this SER, the staff finds the departure acceptable.

The staff finds that:

1) the changes associated with this requested Tier 1 departure will not significantly decrease the level of safety otherwise provided by the design, because the staff found that the applicant has shown that the proposed design meets the criteria for RW-IIa (High Hazard) of RG 1.143 Revision 2, "Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light-Water-Cooled Nuclear Power Plants." Therefore, the exemption will not significantly decrease the level of safety.

2) the changes associated with this requested Tier 1 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. These changes will ensure that the system will perform in accordance with its design and will not present an undue risk to public health and safety. These changes do not otherwise pertain to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

3) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present. The staff found that the applicant's modifications to the rule (i.e., the radwaste building design change) still provide a design that meets the criteria for RW-IIa of RG 1.143 Revision 2. Therefore, applying the regulation in this particular circumstance is not necessary to meet the underlying purpose of the rule. Therefore, 10 CFR 50.12(a)(2) is satisfied.

4) this departure applies to all COL applicants referencing the ABWR DCD (i.e., it is a standard departure and not a site-specific departure). There are currently no other applicants referencing the ABWR design

certification, and there will be no reduction in standardization. Therefore, 10 CFR 52.63(b)(1) is satisfied.

- STD DEP T1 2.15-2 RBSRDG HVAC

In STP DEP T1 2.15-2, " RBSRDG HVAC [Reactor Building Safety-Related Diesel Generator heating ventilation and air conditioning]," the applicant revised DCD Tier 1 Section 2.15.5, "Heating, Ventilating and Air Conditioning," pertaining to the emergency diesel generator (EDG) engine room maximum temperature limit during EDG operation from 50 degrees Celsius (°C) (122 degrees Fahrenheit [°F]) to 60 °C (140 °F). The staff reviewed this exemption as it affects EDG performance; cable ampacity; environmental equipment qualification; and the operation of other equipment in the room, if any.

In Section 9.4.5 of this SER, the staff concludes that "…the EDG and other safety-related equipment in the EDG room will perform their functions as required and will be consistent with the requirements of GDC 17 and the guidance of RG 1.32." The staff, therefore, found the departure acceptable.

The staff finds that:

1) the changes associated with this requested Tier 1 departure will not significantly decrease the level of safety otherwise provided by the design. The staff found that the applicant has shown that the proposed design meets the requirements of General Design Criterion (GDC) 17, *Electric power systems,* and the guidance of RG 1.32, "Criteria for Power Systems for Nuclear Power Plants." Therefore, the exemption will not significantly decrease the level of safety.

2) the changes associated with this requested Tier 1 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes will ensure that the system will perform in accordance with its design and will not present an undue risk to public health and safety. The changes do not otherwise pertain to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

3) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present. The staff found that the applicant's modifications to the rule (i.e., the increase in EDG engine room operating temperature) still provide a design that meets the criteria of GDC-17 and RG 1.32. Therefore, the application of the regulation in this particular circumstance is not necessary to meet the underlying purpose of the rule. Therefore, 10 CFR 50.12(a)(2) is satisfied.

4) this departure applies to all COL applicants referencing the ABWR DCD, (i.e., it is a standard departure and not a site-specific departure). There are currently no other applicants referencing the ABWR design certification, and there will be no reduction in standardization. Therefore, 10 CFR 52.63(b)(1) is satisfied.

- STD DEP T1 3.4-1 Safety Related I&C Architecture

This departure describes the changes required to the I&C architecture and nomenclature to address obsolete data communication technology in the certified ABWR DCD. In addition, this departure addresses the changes resulting from the selection of digital I&C platforms. Throughout the staff's SER for Chapter 7, the staff evaluated the various impacts of this departure and found that the applicant has satisfactorily addressed this departure in the application. See SER Chapter 7 for more information regarding the extensive review of this Tier 1 departure, and Subsections 16.4.1.1 and 16.4.6.1 for the staff's evaluation of the Technical Specification changes associated with this departure.

The staff finds that:

1) the changes associated with this requested Tier 1 departure will not result in a significant decrease in the level of safety otherwise provided by the design, because the staff found that the changes represent an enhancement to the design with respect to addressing obsolete data communication technology and upgrading digital I&C platforms. As documented in Chapter 7 of this SER, the staff found this departure acceptable. Therefore, the exemption will not significantly decrease the level of safety.

2) the changes associated with this requested Tier 1 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes represent an enhancement to the design that will not present an undue risk to public health and safety. The changes do not otherwise pertain to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

3) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (iv) is present. These changes represent an enhancement to the design by addressing obsolete technology and the selection of digital I&C, therefore the staff finds no decrease in safety from granting the exemption. Therefore, 10 CFR 50.12(a)(2) is satisfied.

4) this departure applies to all COL applicants referencing the ABWR DCD (i.e., it is a standard departure and not a site-specific departure). There are currently no other applicants referencing the ABWR design certification, and the exemption will not reduce standardization. Therefore, 10 CFR 52.63(b)(1) is satisfied.

- STP DEP T1 5.0-1 Site Parameters

The applicant determined the design-basis flood elevation to be 12.2 m (40 ft) mean sea level (MSL), which exceeds the ABWR DCD design value. In part because flood levels in the postulated breach of the main cooling reservoir were higher than the site grade, the applicant proposed departure STP DEP T1 5.0-1, "Site Parameters," from the certified ABWR design.

Subsection 2.4S.4.6 of this SER concludes that "[t]he staff's independent estimate of the additional increase in the floodwater surface elevation under a bounding sediment deposition scenario confirmed that the floodwater surface elevation in the power block area of STP, Units 3 and 4, would not exceed the 12.2-m (40-ft) MSL. The staff finds that the surface water elevations expected during the postulated main cooling reservoir northern embankment breach event is the design-basis flood for the safety-related SSCs at the STP, Units 3 and 4, site." All relevant analyses in Section 3.4, "Water Level (Flood) Design," of Chapter 3, "Design of Structures, Components, Equipment, and Systems," of this SER were conducted with the assumption of the applicant's proposed 12.2-m (40-ft) MSL design-basis flood elevation. For these reasons, the staff finds the departure acceptable.

The 1-hour and 5-minute local probable maximum precipitation (PMP) depths of 50.3 cm (19.8 in.) and 16.3 cm (6.4 in.), respectively, exceed the corresponding ABWR DCD values of 49.3 and 15.7 cm (19.4 and 6.2 in.), respectively. The applicant identifies this exceedance as Departure STP DEP T1 5.0-1 from the certified design. In part because the PMP values exceed those in the ABWR DCD, the applicant proposed Departure STP DEP T1 5.0-1, "Site Parameters," from the certified ABWR design.

In Subsection 2.4S.2.6 of this SER the staff "found that the applicant's estimated values closely match those estimated independently by the staff. The staff also found, based on independent confirmatory analyses, that the applicant had used a conservative approach to estimate the flood levels at and near the power block area of proposed STP, Units 3 and 4." The flood levels due to precipitation were found to be less than the design-basis flood level. For these reasons, the staff determined that the departure is acceptable.

The shear wave velocity at the STP Units 3 and 4 site varies both horizontally within a soil stratum and vertically with depth and does not meet the minimum shear wave velocity requirements of 305 m/s (1,000 ft/s) of ABWR DCD Tier 1 Table 5.0. In part because the minimum shear wave velocity is less than that in the ABWR DCD, the applicant proposed Departure STP DEP T1 5.0-1, "Site Parameters," from the certified ABWR design.

Sections 3.7, "Seismic Design," and 3.8, "Seismic Category I Structures," of this SER contain a detailed evaluation of the SSC design and of the ability of these SSCs to withstand seismic events. All relevant analyses were conducted with the assumption of the applicant's proposed minimum shear wave velocity. Sections 3.7 and 3.8 concluded that the seismic design and the seismic Category I structures meet all applicable regulatory criteria. For this reason, the staff considers the departure acceptable.

The applicant revises the outdoor summer design dry-bulb temperature from the DCD maximum of 46 °C (114.8 °F) to 32.8 °C (91 °F) dry bulb and 26.3 °C (79.3 °F) wet bulb based on the 1 percent annual exceedance value (coincident). In addition, the applicant uses as its winter design condition the 1 percent exceedance value for the STP site of 2.1 °C (35.8 °F) rather than the ABWR winter design temperature of -40 °C (-40 °F).

Subsection 9.4.6.4 of this SER states that "[b]ecause the radwaste building HVAC system is nonsafety-related, using 1 percent outdoor exceedance temperatures to design nonsafety-related HVAC systems is acceptable because it represents a condition that the duration of outdoor temperatures exceeding these values is short (one percent of the time). Any temperature swing in these short time periods will have no safety impact because there is no safety-related functions associated with the operation of the radwaste systems. In addition, the design approach is in accordance with standard industry practice.  The staff found this response acceptable because the HVAC system is nonsafety-related, there is no concern with equipment qualification, and the occasional temperature spike (one percent exceedance) would have no impact on habitability and safety operation."  For these reasons, the staff finds this departure acceptable.

For the reasons stated above (i.e., design-basis flood level, maximum precipitation, shear wave velocity, and ambient temperature) the applicant proposed STD DEP T1 5.0-1, "Site Parameters."  The departure from each of these parameters was evaluated in the appropriate section or sections of this SER.

The staff finds that:

1) the changes associated with this requested Tier 1 departure will not significantly decrease the level of safety otherwise provided by the design because the staff found that for each site parameter changed the staff found, in the appropriate chapter or chapters, that the proposed site parameter change was acceptable under the applicable regulatory criteria.  Therefore, the exemption will not significantly reduce the level of safety.

2) the changes associated with this requested Tier 1 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law.  The changes represent an enhancement to the design that will not present an undue risk to public health and safety. The changes do not otherwise pertain to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

3) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present.  The staff found that the applicant's modifications to the rule (i.e., the changes in the individual site parameters) still provide a design that meets the applicable regulatory criteria and therefore, application of the regulation in this particular circumstance is not necessary to meet the underlying purpose of the rule. Therefore, 10 CFR 50.12(a)(2) is satisfied.

4) This departure is site-specific and not intended to apply to all COL applicants that reference the ABWR DCD.  Site parameters are inherently site-specific.  The proposed departure is necessary in order to ensure that the site parameters conform to the characteristics of the site. Furthermore, the exemption will not significantly reduce safety. Therefore, the reduction in standardization is justified.

### 1.11S.1.5  Conclusion

NRC staff reviewed the information in the application and determined that the exemptions submitted by the applicant meet the requirements of 10 CFR 50.12(a)(1) and that special circumstances are present in accordance with 10 CFR 50.12(a)(2). Therefore, the staff's review concluded that the above exemptions comply with the requirements of 10 CFR 52.7, and these exemptions from the GTS and bases may be granted as allowed by 10 CFR 52 Appendix A, Section VIII.C.4.

## 1.11S.2. Exemptions from the Generic Technical Specifications

### 1.11S.2.1 Introduction

The STP COL application contains numerous applicant-proposed departures from the ABWR certified design. This section has been added to the SER in order to address the exemption evaluations pertaining to the applicant's proposed departure from generic technical specifications. This section does not exist in either the ABWR DCD or COL FSAR.

### 1.11S.2.2 Regulatory Basis

For the ABWR, an applicant-proposed departure from generic technical specifications and other operational requirements is subject to the following requirement:

> An applicant who references this appendix may request an exemption from the generic technical specifications or other operational requirements. The Commission may grant such a request only if it determines that the exemption will comply with the requirements of 10 CFR 52.7.

10 CFR Part 52, App. A, Section VIII.C.4. In this case, only the requirements of 10 CFR 52.7 apply, which means that the criteria of 10 CFR 50.12 govern the exemption.

According to 10 CFR 50.12, an exemption may be granted if (1) the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security, and (2) special circumstances are present. Section 50.12(a)(2) describes those situations where special circumstances are present, which is also described above in the discussion of Tier 1 departures.

Although not explicitly set out in Section VIII.C.4, an exemption from generic technical specifications or other operational requirements is only necessary if the information in question was "comprehensively reviewed and finalized in the design certification rulemaking." 2007 Part 52 Rule, 72 FR 49352, 49365. Using plant-specific technical specification values different from the bracketed values in the generic technical specifications, therefore, would not need an exemption because the values in brackets were not completely reviewed and approved. *Id.* at 49364.

### 1.11S.2.3 Summary of Application

The applicant identified the proposed departures from the ABWR GTS in COL application Part 07, Sections 2.1 and 2.2. Every departure from GTS requires an exemption. The applicant organizes GTS-related departures into four groups. One group includes seven Tier 1 departures that require changes to the GTS. These Tier 1 departures are evaluated in SER Subsection 1.11S.1.4. There are three groups of non-Tier 1 GTS-related departures. The first group includes those Tier 2 design changes that require changes to the GTS. The second group includes changes to the GTS that change the intent of a GTS requirement but do not stem from a Tier 2 design departure. The third group includes changes to the GTS that neither change the intent of a GTS requirement nor stem from a Tier 2 design departure. A summary of these four groups of departures from the GTS follows.

*<u>GROUP I – Tier 2 Design Changes that Require Changes to Generic Technical Specifications</u>*

- STD DEP 6.2-2 Containment Analysis

This departure updates the containment analysis for the ABWR DCD in three areas, (1) modeling flow and enthalpy into the drywell for the feedwater following an FWLB; (2) modeling the drywell connecting vents for the FWLB and MSLB; and (3) modeling the decay heat. The applicant revised the containment analysis in order to update nonconservative assumptions in the ABWR DCD. The revised containment analysis uses the GOTHIC code and is documented in Technical Report WCAP-17058, "Implementation of ABWR Methodology Using GOTHIC for STP 3 and 4 Containment Design Analyses." The peak containment pressure ($P_a$) value in the bases for GTS 3.6.1.1, 3.6.1.2, and 3.6.1.4; and the test criterion for the allowable containment leakage rate at the associated containment test pressure value (Pt) in the bases for GTS 3.6.1.1 were changed so that the PTS bases reflect the updated containment analysis.

- STD DEP 7.3-12 Leak Detection and Isolation System Sump Monitoring

The original ABWR DCD reactor coolant pressure boundary leakage rates were based on a leak-before-break option (which is not used by STP Units 3 and 4) that allowed the use of a lower unidentified leakage limit. In lieu of providing a plant-specific leak-before-break analysis, the applicant revised the drywell leakage rate limits. This departure changes the total leakage averaged over the previous 24-hr period from 95 liters per minute (L/min) (25.1 gallons per minute [gpm]) to 114 L/min (30.1 gpm). The unidentified leakage changed from 3.785 L/min (1 gpm) to 19 L/min (5 gpm). This departure changes GTS LCO 3.4.3 and its associated bases so that the PTS and bases contain the revised leakage limits.

- STD DEP 7.3-17 Automatic Depressurization System (ADS) Electrical Interface

Subsection 7.3.2.1.2 (3e) of the referenced ABWR DCD describes compliance with RG 1.75 Revision 3, "Physical Independence of Electric Systems." This departure updates the STP Units 3 and 4 FSAR to clarify that the ESF instrumentation system control logic consists of three divisions (DIV I, II, and III) that are associated with the three-division design of the emergency core cooling system (ECCS), but there are four divisions of ESF instrumentation sensor signals powered by four electrical divisions that provide signals to the ESF instrumentation control logic. This departure changes the bases of GTS 3.3.1.4 so that the PTS bases correctly state that there are three divisions of ESF instrumentation control logic, not four.

- STD DEP 7.5-1 Post-Accident Monitoring (Drywell Pressure)

This departure updates the ABWR PAM design requirements to more closely follow the TMI-related criteria in 10 CFR 50.34 and the guidance of RG 1.97 Revision 3, "Instrumentation for Light-Water Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," May 1983; and BTP HICB-10, "Guidance on Application of Regulatory Guide 1.97," (Revision 4 of BTP 7-10 dated June 1997 is in NUREG–0800, Appendix 7-A) (ML052500542). This departure affects PTS 3.3.6.1 and its bases by

- changing Function 5.b in GTS Table 3.3.6.1-1 from "Containment Wide Range Pressure" to "Wetwell Pressure"

- adding Function 13, "Wetwell Atmosphere Temperature," to GTS Table 3.3.6.1-1

- changing the discussion of Functions 5.a and 5.b in the "LCO" section of the bases for GTS 3.3.6.1 to show that drywell pressure and wetwell pressure are Type A Instruments (Category 1 PAM variables); and for Function 5.b to show the correct reference to "Wetwell Pressure," rather than to "Containment Wide Range Pressure"

- adding a discussion of Function 13 to the "LCO" section of the bases for GTS 3.3.6.1, explaining that "Wetwell Atmosphere Temperature" is a Category 1 variable and is therefore a required function for post-accident monitoring

• STD DEP 7.7-10 Control Rod Drive Control System Interfaces

This departure revises FSAR Section 7.7 to reflect design changes associated with the RCIS, the performance and monitoring control system (PMCS), and interfaces with the control rod drive (CRD) system. Consistent with these changes, the departure also revises the "Actions" and "SR" sections of the bases for GTS 3.9.4.

By way of background, each control rod has two absolute position indication channels, Synchro A and Synchro B, either of which may be bypassed. The RCIS provides the capability to bypass Synchro A (or Synchro B), if it is bad and select Synchro B (or Synchro A) for providing fine motion control rod drive (FMCRD) absolute rod position data by way of the synchro-to-digital converters (SDCs) to both channels of the RCIS. The RCIS logic prevents the simultaneous bypassing of both synchro analog signals for an individual FMCRD.

Section 7.7 of this SER evaluates this departure and states that the FMCRD system provides the ABWR operator the ability to move the control rods in small increments compared to the current BWR plants that use a hydraulic method of rod movements of 6 inch "steps." In the fully inserted position, the synchros information provides an accurate indication of the control rod when it is fully inserted.

GTS LCO 3.9.4, "Control Rod Position Indication" during Mode 5, "Refueling," specifies that "One control rod 'full-in' position indication channel for each control rod shall be OPERABLE in core cells containing one or more fuel assemblies." In the event the required control rod position indication channel is inoperable (Condition A), Required Action A.1 requires immediately suspending in-vessel fuel movement and control rod withdrawal, and immediately initiating action to fully insert all insertable control rods in core cells containing one or more fuel assemblies. Alternatively, Required Action A.2 requires immediately initiating action to fully insert the control rod associated with the inoperable position indicator, and disarm the associated fully inserted control rod drive.

The "Background" section of the bases for GTS 3.9.4 describes how the required full-in position indication channel is used during refueling, as follows:

The [required] full-in position indication channel for each control rod provides information necessary to the refueling interlocks to prevent inadvertent criticalities during refueling operations. For the Fine Motion Control Rod Drives (FMCRD), position is derived from synchros which have an analog output. The RCIS translates the 100% insertion signal from the synchro into a discrete full-in position signal to be used as a permissive in the refueling interlocks. During refueling, the refueling interlocks (LCO 3.9.1, “Refueling Equipment Interlocks,” and LCO 3.9.2, “Refuel Position Rod-Out Interlock”) use the full-in position indication channels to limit the operation of the refueling equipment and the movement of the control rods.

The refueling interlocks and the RCIS Gang/Single selection switch allow a single control rod to be withdrawn at any time unless fuel is being loaded into the core. The absence of the full-in position indication channel signal for any control rod removes the all-rods-in permissive for the refueling equipment interlocks and prevents fuel loading. Also, this condition causes the refuel position rod-out interlock to not allow the withdrawal of any other control rod.

Based on the style and content conventions of the Standard TS, the action requirements for Condition A are understood to also include an action to restore compliance with the LCO; that is, restore one full-in position indication channel to operable status. The “Actions” section of the bases for GTS 3.9.4 describes how to restore a full-in position indication channel to operable status to satisfy the refueling interlocks so that in-vessel fuel movement may continue, as follows. The changes made by this departure are indicated by lining out deleted text and underlining inserted text; information in brackets is provided to the reader for clarification, but is not included in the bases:

Under these conditions [no all-rods-in permissive signal because of an inoperable synchro on one control rod, or control rod pair], an inoperable full-in channel may be bypassed to allow refueling operations to proceed. An alternate method must be used to ensure the control rod is fully inserted (e.g., use the 0% [reed switch] position indication). Another option is to bypass Synchro A or Synchro B so that the OPERABLE synchro providing rod position data to both channels of the RCIS is used. If the readings of the two Synchros do not agree, the conditions will be alarmed to the operator to initiate bypass.

As a result of the changes made in FSAR Section 7.7, the bases for GTS 3.9.4 are revised as noted above so that the PTS bases describe bypassing the inoperable synchro channel and using the signal from the (other) operable synchro channel as an alternate method to verify full-in position of the affected rod and to provide position indication signals to both RCIS channels to satisfy the refueling interlocks.

This departure also revises the last sentence of the bases for GTS SR 3.9.4.1, which requires verifying that the required full-in channel has no “full-in” indication on each control rod that is not “full-in”, as follows (with deleted text lined-out):

Performing the SR each time a control rod is withdrawn is considered adequate because of the procedural controls on control rod withdrawals and the visual ~~and audible~~ indications available in the control room to alert the operator to control rods not fully inserted.

This change is considered administrative because it only clarifies that the justification for the surveillance frequency does not rely on audible alarms in the control room.

- STD DEP 7.7-18 — Rod Control and Information System Operator Information

This departure changes FSAR Chapter 7 to reflect design changes associated with the RCIS reactor operator interface functions including annunciations, status information, and operator controls. The departure also updates the “Background” section of the bases for GTS 3.9.3, 3.10.3, 3.10.4, and 3.10.5 to maintain consistency with FSAR Chapter 7 and to correctly describe the manner in which the RCIS is placed in the Scram Test Mode.

- STD DEP 8.3-1 — Plant Medium Voltage Electrical System Design

This departure changes the medium voltage ac distribution system design as described in the DCD and requires changes to the FSAR Chapter 8 description of the offsite electric power system, the onsite ac power distribution system, and safety loads. The changes made in FSAR Chapter 8 require that the applicant revise GTS 3.3.1.1 and the bases for GTS 3.3.1.1 and 3.3.1.4 to show that medium voltage is 4.16 kV, not 6.9 kV. This departure also changes electrical operating requirements for the combustion turbine generator (CTG) and DG in the GTS and bases so that PTS 3.5.1, 3.8.1, 3.8.4, 3.8.9, and 3.8.11; and the bases for PTS 3.8.1, 3.8.2, 3.8.7, 3.8.8, 3.8.9, and 3.8.11 reflect the new design.

- STP DEP 8.3-3 — Electrical Site Specific Power and Other Changes

This departure revises the medium voltage ac electrical distribution system. Site-specific changes were made to accommodate the new arrangements and electrical loads as described in FSAR Section 8.3. In addition to the changes made to DCD Section 8.3, the bases of GTS 3.8.9 were revised so that PTS bases Table B 3.8.9-1 will reflect the ac bus changes.

- STD DEP 10.4-5 — Condensate and Feedwater System

This departure changes the “Background” section of the bases for GTS 3.3.4.2 so that the PTS bases will reflect the associated changes to Tier 2 information in the ABWR DCD, which are incorporated into the FSAR. This departure changes the design of the CFS by increasing the number of feedwater pumps from two to four. Each feedwater pump has one adjustable speed drive (ASD), so there are four ASDs. This departure also changes the CFS design by adding condensate booster pumps and two additional reactor feedwater heater drain pumps, and by improving the capability of the CFS to control feedwater flow during unit startup.

*GROUP II – Changes of Intent to Generic Technical Specifications*

- STD DEP 16.2-1 Safety Limit Violation

This departure deletes GTS 2.2.1, 2.2.3, 2.2.4, and 2.2.5 and their associated bases so that they are not included in the PTS and bases. GTS 2.2.3 was deleted because it does not meet the criteria for inclusion in the TS; it is being relocated to a conduct of operations-type procedure. The other specifications were deleted because they are duplicative of the requirements in 10 CFR 50.72, 10 CFR 50.73, and 10 CFR 50.36(d)(1).

- STD DEP 16.3-78 LCO 3.3.6.1, Post Accident Monitoring Instrumentation

This departure removes the containment water level parameter from GTS 3.3.6.1, "Post Accident Monitoring Instrumentation (PAM)," so that PTS 3.3.6.1 and bases do not include it. Drywell sump level and drywell water level are neither type A nor Category I non-type A variables. Therefore, the associated monitoring instrumentation does not meet the criteria for inclusion in the TS in accordance with RG 1.97 Revision 3, and may be omitted from the PTS and bases.

- STD DEP 16.5-1 Unit Responsibility

This departure changes GTS 5.1.2 so that PTS 5.1.2 will allow an individual with an active reactor operator (RO) license, as well as an individual with an active senior reactor operator (SRO) license, to assume the control room command function during the absence of the shift supervisor while the unit is in Mode 4, cold shutdown. The GTS require an SRO to assume command in Modes 1, 2, 3, and 4 and either an RO or SRO in Mode 5. The PTS will allow an RO, not only an SRO, to assume the control room command function while the unit is in Mode 4. This departure is acceptable because it is consistent with the requirements in 10 CFR 50.54(m)(2)(iii).

- STD DEP 16.5-2 Unit Staff

This departure changes the position title of "auxiliary operator" in GTS 5.2.2, "Unit Staff," to "non-licensed operator" in PTS 5.2.2. This administrative change makes the PTS consistent with the title that will be used for this staff position at STP Units 3 and 4.

- STD DEP 16.5-3 Technical Specification Bases Control Program

This departure from GTS 5.4.2.b updates the description of the process for making changes to the PTS bases after the COL is approved. These updates make PTS 5.4.2 consistent with the current versions of 10 CFR 50.59 and 10 CFR 52.98 and are therefore acceptable.

- STD DEP 16.5-4 Reporting Requirements

This departure changes the reporting date in GTS 5.7.1.1 from March 31 to April 30 of each year to make PTS 5.7.1.1 consistent with 10 CFR 20.2206.

- STD DEP 16.5-5 Unit Staff – Working Hours

This departure deletes the working hour limits specified by GTS 5.2.2.d because they have been superseded by 10 CFR Part 26 Subpart I, “Managing Fatigue.” Omitting GTS 5.2.2.d from PTS 5.2.2 is acceptable because work hour controls and fatigue management requirements have been incorporated into the NRC regulations. Therefore, it is unnecessary to have work hour controls and fatigue management requirements in the PTS.

- STD DEP 16.5-6 Inservice Testing Program

This departure updates GTS 5.5.2.6, “Inservice Testing Program,” to bring PTS 5.5.2.6 into agreement with current regulatory requirements in 10 CFR 50.55a by referencing the ASME Code for Operation and Maintenance of Nuclear Power Plants (OM Code) instead of Section XI of the ASME Boiler & Pressure Vessel Code (BPV Code) and the applicable Addenda. This change is acceptable because it makes PTS 5.5.2.6 conform with the inservice testing (IST) requirements of 10 CFR 50.55a and be consistent with the full description of the IST operational program in the FSAR. This change is also acceptable because it makes PTS 5.5.2.6 consistent with the guidance in NRC Standard Review Plan (SRP) Section 3.9.6, "Functional Design, Qualification, and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints."

*GROUP III – Generic Technical Specification Editorial Revisions and Clarifications*

The following departures from the GTS neither change the intent of the affected GTS and bases provisions nor stem from DCD Tier 2 design departures. The changes associated with these departures are editorial, clarifying, grammatical, or otherwise considered administrative. These changes do not affect the technical content except in a few cases to correct inconsistencies with DCD Tier 1 and Tier 2 information, which is consistent with the intent of such cases. These changes improve the readability, implementation, and understanding of the affected provisions in the GTS and bases and are therefore acceptable.

- STD DEP 16.2-2 Safety Limits
- STD DEP 16.3-1 3.0, Limiting Condition for Operation (LCO) Applicability
- STD DEP 16.3-2 LCO 3.0 and Surveillance Requirements (SRs)
- STD DEP 16.3-4 LCO 3.1.1, Shutdown Margin (SDM)
- STD DEP 16.3-5 LCO 3.4.1, Reactor Internal Pumps (RIPs) – Operating
- STD DEP 16.3-6 LCO 3.4.1, Reactor Internal Pumps (RIPs) – Operating
- STD DEP 16.3-7 LCO 3.4.2, Safety/Relief Valves (S/RVs)

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| • | STD DEP 16.3-8 | LCO 3.4.9, RCS Pressure and Temperature (P/T) Limits |
| • | STD DEP 16.3-9 | LCO 3.4.7, Alternate Decay Heat Removal |
| • | STD DEP 16.3-10 | LCO 3.5.1, ECCS – Operating |
| • | STD DEP 16.3-11 | 3.4.3, RCS Operational LEAKAGE |
| • | STD DEP 16.3-13 | LCO 3.9.8, Residual Heat Removal (RHR) – “Low Water Level” Applicability |
| • | STD DEP 16.3-14 | LCO 3.9.2, Refuel Position Rod – Out Interlock |
| • | STD DEP 16.3-15 | LCO 3.9.5, Control Rod OPERABILITY – Refueling |
| • | STD DEP 16.3-16 | LCO 3.7.1, Reactor Building Cooling Water (RCW) System, Reactor Service Water (RSW) System, and Ultimate Heat Sink (UHS) – Operating, |
| | | LCO 3.7.2, RCW/RSW System and UHS – Shutdown, and |
| | | LCO 3.7.3, RCW/RSW System and UHS – Refueling |
| • | STD DEP 16.3-17 | LCO 3.10.12, Multiple Control Rod Drive Subassembly Removal – Refueling |
| • | STD DEP 16.3-18 | LCO 3.10.8 SHUTDOWN MARGIN (SDM) Test – Refueling |
| • | STD DEP 16.3-19 | LCO 3.10.4, Control Rod Withdrawal – Cold Shutdown |
| • | STD DEP 16.3-20 | LCO 3.10.4, Control Rod Withdrawal – Cold Shutdown |
| • | STD DEP 16.3-21 | LCO 3.10.5, Control Rod Drive (CRD) Removal – Refueling |
| • | STD DEP 16.3-23 | LCO 3.10.5, Control Rod Drive (CRD) Removal – Refueling |
| • | STD DEP 16.3-24 | LCO 3.10.3, Control Rod Withdrawal – Hot Shutdown Bases |
| • | STD DEP 16.3-25 | LCO 3.9.1, Refueling Equipment Interlocks |

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| • | STD DEP 16.3-26 | LCO 3.10.2, Reactor Mode Switch Interlock Testing |
| • | STD DEP 16.3-27 | LCO 3.10.2, Reactor Mode Switch Interlock Testing |
| • | STD DEP 16.3-28 | LCO 3.10.1, In-Service Leak and Hydrostatic Testing Operation |
| • | STD DEP 16.3-29 | LCO 3.6.4.1, Secondary Containment |
| • | STD DEP 16.3-30 | LCO 3.6.4.1, Secondary Containment |
| • | STD DEP 16.3-31 | LCO 3.6.4.3, Standby Gas Treatment (SGT) System |
| • | STD DEP 16.3-32 | LCO 3.6.2.1, Suppression Pool Average Temperature |
| • | STD DEP 16.3-33 | LCO 3.6.2.1, Suppression Pool Average Temperature |
| • | STD DEP 16.3-34 | LCO 3.6.1.6, Wetwell-to-Drywell Vacuum Breakers |
| • | STD DEP 16.3-35 | LCO 3.9.6, Reactor Pressure Vessel (RPV) Water Level |
| • | STD DEP 16.3-36 | LCO 3.6.2.3, Residual Heat Removal (RHR) Suppression Pool Cooling |
| • | STD DEP 16.3-37 | LCO 3.6.2.3, Residual Heat Removal (RHR) Suppression Pool Cooling |
| • | STD DEP 16.3-40 | LCO 3.8.2, AC Sources – Shutdown |
| • | STD DEP 16.3-41 | LCO 3.8.2, AC Sources – Shutdown |
| • | STD DEP 16.3-42 | LCO 3.8.4, DC Sources – Operating |
| • | STD DEP 16.3-43 | LCO 3.6.1.1, Primary Containment |
| • | STD DEP 16.3-45 | LCO 3.6.1.1, Primary Containment |
| • | STD DEP 16.3-46 | LCO 3.7.2, RCW, RSW, and UHS Applicability |
| • | STD DEP 16.3-47 | LCO 3.7.4, Control Room Habitability Area (CRHA) – Emergency Filtration (EF) System |
| • | STD DEP 16.3-48 | LCO 3.7.4, Control Room Habitability Area (CRHA) – Emergency Filtration (EF) System |

- STD DEP 16.3-49 LCO 3.8.1, AC – Sources-Operating
- STD DEP 16.3-50 LCO 3.3.1.4, ESF Actuation Instrumentation
- STD DEP 16.3-51 LCO 3.8.3, Diesel Fuel Oil, Lube Oil, and Starting Air
- STD DEP 16.3-52 LCO 3.8.8, Inverters – Shutdown
- STD DEP 16.3-55 LCO 3.3.4.1, Anticipated Transient Without Scram (ATWS) and End-of-Cycle Recirculation Pump Trip (EOC-RPT) Instrumentation
- STD DEP 16.3-57 LCO 3.3.1.2, Reactor Protection System (RPS) and Main Steam Isolation Valve (MSIV) Actuation
- STD DEP 16.3-58 LCO 3.8.6, Battery Cell Parameters
- STD DEP 16.3-59 LCO 3.3.6.2, Remote Shutdown System
- STD DEP 16.3-60 LCO 3.3.6.2, Remote Shutdown System
- STD DEP 16.3-61 LCO 3.3.7.1, CRHA EF System Instrumentation
- STD DEP 16.3-62 LCO 3.3.8.1, Electric Power Monitoring
- STD DEP 16.3-63 LCO 3.3.8.2, Reactor Coolant Temperature Monitoring – Shutdown
- STD DEP 16.3-64 LCO 3.3.5.1, Control Rod Block Instrumentation
- STD DEP 16.3-65 LCO 3.3.5.1, Control Rod Block Instrumentation
- STD DEP 16.3-66 LCO 3.3.5.1, Control Rod Block Instrumentation
- STD DEP 16.3-67 LCO 3.3.5.1, Control Rod Block Instrumentation
- STD DEP 16.3-69 LCO 3.6.1.2, Primary Containment Air Locks
- STD DEP 16.3-70 LCO 3.6.1.2, Primary Containment Air Locks
- STD DEP 16.3-73 LCO 3.6.1.3, Primary Containment Isolation Valves (PCIVs)

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| • STD DEP 16.3-74 | LCO 3.6.1.3, Primary Containment Isolation Valves (PCIVs) |
| • STD DEP 16.3-75 | LCO 3.7.6, Main Condenser Offgas |
| • STD DEP 16.3-76 | LCO 3.7.5, Control Room Habitability Area (CRHA) – Air Conditioning (AC) System |
| • STD DEP 16.3-77 | LCO 3.3.6.1, Post Accident Monitoring (PAM) Instrumentation |
| • STD DEP 16.3-78 | LCO 3.3.6.1, Post Accident Monitoring (PAM) Instrumentation |
| • STD DEP 16.3-80 | LCO 3.8.1, AC Sources – Operating |
| • STD DEP 16.3-81 | LCO 3.3.1.2, Reactor Protection System (RPS) and Main Steam Isolation Valve (MSIV) Actuation |
| • STD DEP 16.3-82 | LCO 3.3.1.2, Reactor Protection System (RPS) and Main Steam Isolation Valve (MSIV) Actuation |
| • STD DEP 16.3-83 | LCO 3.3.1.3, Standby Liquid Control (SLC) and Feedwater Runback (FWRB) Actuation |
| • STD DEP 16.3-84 | LCO 3.3.1.1, SSLC Sensor Instrumentation |
| • STD DEP 16.3-85 | LCO 3.3.1.1, SSLC Sensor Instrumentation |
| • STD DEP 16.3-86 | LCO 3.3.1.4, ESF Actuation Instrumentation |
| • STD DEP 16.3-87 | LCO 3.3.1.4, ESF Actuation Instrumentation |
| • STD DEP 16.3-91 | LCO 3.3.1.1, SSLC Sensor Instrumentation |
| • STD DEP 16.3-92 | LCO 3.3.1.1, SSLC Sensor Instrumentation |
| • STD DEP 16.3-93 | LCO 3.3.1.1, SSLC Sensor Instrumentation |
| • STD DEP 16.3-94 | LCO 3.3.1.4, ESF Actuation Instrumentation |
| • STD DEP 16.3-95 | LCO 3.2.3 Linear Heat Generation Rate (LHGR) (Non-GE Fuel) |
| • STD DEP 16.3-96 | LCO 3.4.1, RIPs Operating |
| • STD DEP 16.3-97 | Technical Specification Editorial Changes |
| • STD DEP 16.3-98 | SR 3.3.1.1.4, DIVISION FUNCTIONAL TEST for SRNMs |

- STD DEP 16.3-99 — Bases Allowable Value Misstatements
- STD DEP 16.3-100 — Setpoint Control Program Implementation
- STD DEP 16.3-101 — Bases LCO 3.3.5.1, REQUIRED ACTIONS A.1 and C.1
- STD DEP 16.3-102 — Bases SR 3.3.5.1.6
- STD DEP 16.3-103 — SR 3.8.1.15, Note 1
- STD DEP 16.3-104 — SR 3.3.4.2.2 - CHANNEL FUNCTIONAL TEST – Feedwater Pump and Main Turbine Trip Instrumentation
- STD DEP 16.3-105 — LCO 3.3.1.1, ACTIONS Q.1, Q.2.1 and Q.2.2;

  LCO 3.3.1.2, ACTIONS L.1, L.2.1 and L.2.2, and

  LCO 3.6.1.3, ACTIONS A.1 and A.2 - Operation with an Isolated Main Steamline

*GROUP IV – Tier 1 Design Changes that Require Changes to Generic Technical Specifications*

The following are the Tier 1 departures that also require changing the GTS and bases. The exemption evaluations of these departures are in SER Section 1.11S.1, "Tier 1 Exemptions."

- STD DEP T1 2.3-1 — Deletion of Main Steam Isolation Valve (MSIV) Closure and Scram on High Radiation
- STD DEP T1 2.4-2 — Feedwater Line Break Mitigation
- STD DEP T1 2.4-3 — RCIC Turbine/Pump
- STD DEP T1 2.5-1 — Elimination of New Fuel Storage Racks from New Fuel Vault
- STD DEP T1 2.12-2 — I&C Power Divisions
- STD DEP T1 2.14-1 — Hydrogen Recombiner Requirements Elimination
- STD DEP T1 3.4-1 — Safety-Related I&C Architecture

### 1.11S.2.4 Technical Evaluation

The staff's evaluations of the exemptions for changes to GTS are summarized below.

*GROUP I – Tier 2 Design Changes that Require Changes to Generic Technical Specifications*

- STD DEP 6.2-2 Containment Analysis

The applicant changes the peak containment pressure ($P_a$) in the bases for GTS 3.6.1.1, 3.6.1.2, and 3.6.1.4, and the test criterion for the allowable containment leakage rate at the associated containment test pressure (Pt) in the bases for GTS 3.6.1.1. These changes are based on the containment pressure response calculated using an improved analysis of the design basis feedwater line break event, which is described in Technical Report WCAP-17058 dated June 2009. The revised containment analysis in WCAP-17058 incorporates the following corrections to the ABWR DCD: the modeling of M&E released into drywell for the feedwater following an FWLB; the modeling of the drywell-connecting vents for the FWLB and MSLB; and the modeling of decay heat. The staff's evaluation of WCAP-17058 is in Subsection 6.2.1.4 of this SER. The staff performed independent confirmatory calculations and verified that the STP Units 3 and 4 containment analysis was conservative. As a result of the more conservative analysis, he applicant's GOTHIC-calculated peak drywell pressure and temperatures are higher than those reported in the ABWR DCD. The staff determined that WCAP-17058 and the associated changes to the DCD proposed in STD DEP 6.2-2, other than to the GTS bases, are acceptable. Because the new pressure value of 281.8 kilopascals gauge (kPaG) (40.87 pounds per square inch gauge [psig]) corresponds to the calculated maximum peak containment pressure ($P_a$) in the improved and more conservative containment analysis, the changes to the GTS bases in Departure STD DEP 6.2-2 are also acceptable. Based on this information, the staff's evaluations of WCAP-17058, and the associated changes to the DCD (which the departure incorporates into the FSAR), Departure STD DEP 6.2-2 is acceptable. Further information is in the staff evaluation of this TS change in Subsection 16.4.9.1 of this SER.

With respect to applying the exemption criteria to the changes to the bases for GTS Section 3.6 identified above, and associated changes to DCD Tier 2 resulting from the updated containment analysis, the staff finds that:

1) that the changes associated with this requested Tier 2 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes are based on an improved and more conservative containment analysis and therefore will not present an undue risk to public health and safety. The changes do not otherwise relate to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

2) that special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present because these changes result from an improved and more conservative calculation of the peak containment pressure during the feedwater line break design-basis event. The results of the revised containment analysis provide a stronger demonstration of the adequacy of the containment design, the staff finds that the departure will continue to meet the underlying intent of the rule. Therefore, 10 CFR 50.12(a)(2) is satisfied.

- STD DEP 7.3-12 Leak Detection and Isolation System Sump Monitoring

This departure changes the total leakage averaged over the previous 24-hr period from 95 L/min (25.1 gpm) to 114 L/min (30.1 gpm). The unidentified leakage is changed from 3.785 L/min (1 gpm) to 19 L/min (5 gpm). This departure also changes GTS LCO 3.4.3 and its associated bases so that PTS LCO 3.4.3 and the bases contain the revised leakage limits. The staff evaluated this departure and found it acceptable, as described in SER Sections 7.3 and 5.2.5 and Subsection16.4.7.3. As presented in SER Section 5.2.5, the staff determined that the changes made to the GTS leakage limits do not change the accuracy, sensitivity, or response time capabilities of the leakage detection system, and therefore do not change the intent of the GTS. In addition, the staff determined that the leakage alarm setpoint and the alarm response procedures will provide an early warning signal that will alert the operator to take actions before reaching any leakage limit of PTS LCO 3.4.3. In SER Section 7.3, the staff reviewed this departure and found that the changes include new leakage setpoint values and the addition of an increase in unidentified leakage parameters for the leak detection and isolation system. However, the staff determined that this departure does not change the intent of the generic TS. This departure therefore meets the requirements of 10 CFR 50.55a(h) (IEEE Std 603–1991); 10 CFR 50.34(f)(2); and GDC 13, 19, and 20. The staff found reasonable assurance that this departure is acceptable from the I&C perspective. Further information is in the staff evaluation of this TS change in Subsection 16.4.7.3 of this SER.

With respect to applying the exemption criteria to the changes to GTS 3.4.3 and bases identified above, and the associated changes to DCD Tier 2 Sections 5.2 and 7.3, the staff finds that:

1) the changes associated with this requested Tier 2 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes maintain acceptable limits on RCS leakage and therefore will not present an undue risk to public health and safety. The changes do not otherwise relate to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

2) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present. The application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule, which is to ensure timely identification of increases in RCS pressure boundary leakage and the application of appropriate remedial actions when leakage limits are exceeded. In addition, the staff finds no decrease in safety from granting the exemption. Therefore, 10 CFR 50.12(a)(2) is satisfied.

- STD DEP 7.3-17 Automatic Depressurization System (ADS) Electrical Interface

This departure updates the STP Units 3 and 4 COL FSAR to clarify that there are just three divisions of ESF instrumentation control logic (DIV I, II, and III) associated with the three divisions of ECCS, but that there are four divisions of ESF instrumentation sensors that are powered by four electrical divisions, which provide signals to the ESF instrumentation control logic. Specifically, the bases for GTS 3.3.1.4 are clarified so that the bases for PTS 3.3.1.4 will state that there are three divisions of ESF instrumentation control logic, not four. The staff evaluated this departure and found it acceptable, as described in SER Section 7.3.4 and Subsection 16.4.6.4. Specifically, the staff found that the changes to the FSAR provide a more complete description of how the ECCS design complies with RG 1.75. The staff found that the departure clarifies the control logic that is only in Div I, II, and III to conform to the three divisions of the ECCS; and sensor signals come from all four electrical divisions. The staff verified that the bases for PTS 3.3.1.4 accurately reflect the design of STP Units 3 and 4, as described in FSAR Subsection 7.3.2.1.2(3e), and they do not change the intent of GTS 3.3.1.4. Further information is in the staff evaluation of this TS change in Subsection 16.4.6.4 of this SER.

With respect to applying the exemption criteria to the changes to the bases for GTS 3.3.1.4 identified above, and the associated changes to DCD Tier 2 Subsection 7.3.2.1.2(3e), the staff finds that:

1) the changes associated with this requested Tier 2 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes provide a necessary clarification of the ESF instrumentation system description in the bases for PTS 3.3.1.4, which improves the usability of the PTS bases and therefore will not present an undue risk to public health and safety. The changes do not otherwise relate to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

2) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (iv) is present. These changes would benefit public health and safety by improving the bases for GTS 3.3.1.4 to make the bases for PTS 3.3.1.4 more useable by clearly describing the design of the ESF instrumentation system. Therefore, 10 CFR 50.12(a)(2) is satisfied.

- STD DEP 7.5-1 Post-Accident Monitoring (Drywell Pressure)

This departure updates the ABWR PAM design requirements to follow more closely the TMI-related criteria in 10 CFR 50.34, the guidance of RG 1.97 Revision 3, and BTP HICB-10. The staff evaluated this departure and found it acceptable, as described in SER Section 7.5.4 and Subsection 16.4.6.10. The identified changes in the departure add TS requirements for PAM instrumentation functions that were previously exempted in the certified ABWR DCD, Revision 4, but are now redesigned to better comport with RG 1.97 Revision 3; and they therefore should be included in PTS 3.3.6.1. The staff's review determined that the changes meet the TMI-related criteria in 10 CFR 50.34 the guidance of RG 1.97 Revision 3, and BTP HICB-10 and are therefore acceptable. Further information is in the staff evaluation of this TS change in Subsection 16.4.6.10 of this SER.

With respect to applying the exemption criteria to the changes to GTS 3.3.6.1 and bases identified above, and the associated changes to DCD Tier 2 Section 7.5, the staff finds that:

1) the changes associated with this requested Tier 2 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes specify additional PAM instrumentation of the improved design in PTS 3.3.6.1 and therefore will not present an undue risk to public health and safety. The changes do not otherwise relate to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

2) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present. The departure will increase PTS requirements for PAM instrumentation and therefore will continue to meet the underlying purpose of the rule. Therefore, 10 CFR 50.12(a)(2) is satisfied.

- STD DEP 7.7-10 Control Rod Drive Control System Interfaces

This departure revises FSAR Section 7.7 to reflect design changes associated with the RCIS and PMCS and interfaces with the CRD system. Consistent with these changes, the “Actions” section of the bases for GTS 3.9.4 is revised to state that an inoperable synchro (either synchro A or B) may be bypassed so that the operable synchro may be used to verify full-in rod position and provide an absolute position indication signal by way of the synchro-to-digital converters (SDCs) to both channels of the RCIS, which will enable the all-rods-in permissive for the refueling equipment interlocks and allow refueling operations to proceed. The staff evaluated this departure and found it acceptable, as described in SER Section 7.7.4 and Subsection 16.4.12.4. Specifically, the changes are incorporated into the bases for PTS 3.9.4 and are acceptable because they are consistent with the changes in the design descriptions of the SDCs and the FMCRD in FSAR Subsection 7.7.1.2.1. In addition, the staff found that Departure STD DEP 7.7-10 is acceptable because it meets the criteria of Section 7.7 of NUREG–0800. Further information is in the staff evaluation of this TS change in Subsection 16.4.12.4 of this SER.

With respect to applying the exemption criteria to the changes to the bases of GTS 3.9.4 identified above, and the associated changes to DCD Tier 2 Subsection 7.7.1.2.1, the staff finds that:

1) the changes associated with this requested Tier 2 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes represent a design improvement that requires updating the bases of GTS 3.9.4 and therefore will not present an undue risk to public health and safety. The changes do not otherwise relate to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

2) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present. The purpose of the TS is to ensure the plant is in the proper condition for refueling operations to proceed. Verifying rod position by either use of synchro A or synchro B will give operators the information they need; therefore, application of the

rule is not necessary to meet the underlying intent of the rule. Therefore, 10 CFR 50.12(a)(2) is satisfied.

- STD DEP 7.7-18 — Rod Control and Information System Operator Information

This departure changes FSAR Chapter 7 to reflect design changes associated with the RCIS reactor operator interface functions including annunciations, status information, and operator controls. The departure also updates the “Background” section of the bases for GTS 3.9.3, 3.10.3, 3.10.4, and 3.10.5 to maintain consistency with FSAR Chapter 7 and to correctly describe the manner in which the RCIS is placed in the Scram Test Mode. The staff evaluated this departure and found it acceptable, as described in SER Section 7.7.4 and Subsection 16.4.12.3. The proposed changes to the GTS bases consist only of rewording for clarification and editorial corrections. The changes do not change the meaning or intent of the GTS bases, and are therefore administrative and acceptable. In addition, the staff found that Departure STD DEP 7.7-18 has adequately addressed the criteria of Section 7.7 of NUREG–0800. Further information is in the staff evaluation of this TS change in Subsections 16.4.12.3, 16.4.13.3, 16.4.13.4, and 16.4.13.5 of this SER.

With respect to applying the exemption criteria to the changes to the GTS bases identified above and the associated changes to DCD Tier 2 Chapter 7, the staff finds that

1) the changes associated with this requested Tier 2 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes are administrative consisting only of rewording for clarification and editorial corrections, with no changes to the meaning or intent of the GTS bases. The changes therefore will not present an undue risk to public health and safety. The changes do not otherwise relate to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

2) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present. These administrative changes do not affect the underlying purpose of the affected language in the GTS bases, and therefore retaining the original language is not necessary to achieve the underlying purpose of the GTS bases. Therefore, 10 CFR 50.12(a)(2) is satisfied.

- STD DEP 8.3-1 — Plant Medium Voltage Electrical System Design

This departure changes the medium voltage ac distribution system design, as described in the DCD, and requires changes to the FSAR Chapter 8 description of the offsite electric power system; the onsite ac power distribution system; and safety loads. The changes made in FSAR Chapter 8 require that the applicant revise GTS 3.3.1.1 and the bases for GTS 3.3.1.1 and 3.3.1.4 to show that medium voltage is 4.16 kV, not 6.9 kV. This departure also changes electrical operating requirements for the CTG and DG in the GTS and bases so that PTS 3.5.1, 3.8.1, 3.8.4, 3.8.9, and 3.8.11; and the bases for PTS 3.8.1, 3.8.2, 3.8.7, 3.8.8, 3.8.9, and 3.8.11 reflect the new design. The staff evaluated this departure in SER Sections 8.1.4, 8.2.4, and 8.4S.4 and SER Subsections 8.3.1.4 and 8.3.2.4. The staff determined that the departure’s changes to FSAR Chapter

8 meet the requirements of GDC 17 and the guidance in RG 1.206 and are therefore acceptable. In addition, the staff evaluated the departure's changes to the GTS and bases in SER Subsection 16.4.11.1 and determined that the changes are acceptable. Further information is in the staff evaluation of this TS change in Subsection 16.4.11.1 of this SER.

With respect to applying the exemption criteria to the above changes to the GTS and bases and the associated changes to DCD Tier 2 Chapter 8, the staff finds that

1) the changes associated with this requested Tier 2 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes represent an alternate but fully acceptable electrical power system design that will not present an undue risk to public health and safety. The changes do not otherwise relate to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

2) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present. These changes represent an alternate but fully acceptable electrical power system design. Therefore, retaining the design as described in the DCD and reflected in the related GTS provisions is not necessary to achieve the underlying purpose of the GTS and bases. Therefore, 10 CFR 50.12(a)(2) is satisfied.

- STP DEP 8.3-3 Electrical Site Specific Power and Other Changes

This departure revises the medium voltage ac electrical distribution system. As a result, site-specific changes were made to accommodate the new arrangements and electrical loads as described in FSAR Section 8.3. In addition to the changes made in FSAR Chapter 8, the bases of GTS 3.8.9 were revised so that PTS bases Table B 3.8.9-1 will reflect the ac bus changes. The site-specific changes made to FSAR Tables 8.3-1 and 8.3-3 and Figures 8.3-1 and 8.3-2 as a result of performing load study calculations and DG and CTG sizing calculations were evaluated and found to be acceptable as described in SER Subsection 8.3.1.4. Based on the evaluation in SER Subsection 8.3.1.4, the changes incorporated into the TS bases as a result of this departure were found to be acceptable as described in SER Subsection 16.4.11.9. Further information is in the staff evaluation of this TS change in Subsection 16.4.11.9 of this SER.

With respect to applying the exemption criteria to the above identified changes to the GTS bases and the associated changes to FSAR Section 8.3, the staff finds that

1) the changes associated with this requested Tier 2 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes are based on providing acceptable margins to site-specific electrical design constraints, and they therefore will not present an undue risk to public health and safety. The changes do not otherwise relate to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

2) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present. These changes represent an alternate but fully acceptable electrical power system design; therefore, retaining the medium voltage ac electrical distribution system as described in the DCD in the particular circumstance of STP Units 3 and 4 would not serve the underlying purpose of the GTS and bases. Therefore, 10 CFR 50.12(a)(2) is satisfied.

- STD DEP 10.4-5 Condensate and Feedwater System

The staff evaluated this departure against the applicable acceptance criteria of SRP Section 10.4.7, as described in SER Subsection 10.4.7.4. This departure changes the CFS design by adding condensate booster pumps, two additional reactor feedwater heater drain pumps, and an additional reactor feedwater pump; and by improving the capability of the CFS to control feedwater flow during unit startup.

The CFS as described in the ABWR DCD does not use condensate booster pumps. The use of condensate booster pumps, in combination with condensate pumps, does not adversely impact the ability of the CFS to perform its designed function. Additionally, the booster pumps are located outside the containment and are therefore not part of the safety-related portion of the system. This change in the condensate system pump design does not require updating the GTS.

The modified CFS design incorporates four 33-percent capacity feedwater heater drain pumps in place of the certified design’s two heater drain pumps, each with a capacity of 33 percent of full feedwater flow. The reactor feedwater heater drain pumps are located outside the containment and are therefore not part of the safety-related portion of the CFS. The addition of the new reactor feedwater heater drain pumps does not change the staff’s conclusion that the CFS complies with the SRP guidance, as documented in NUREG–1503. This change in the reactor heater drain pump design does not require updating the GTS.

The modified CFS design incorporates four 33-percent capacity reactor feedwater pumps in place of the certified design’s three reactor feedwater pumps, each with a capacity of 33 to 65 percent of full feedwater flow. The addition of the reactor feedwater pump does not change the normal operation of the system and is intended to enhance plant availability by serving as a standby feedwater pump, which will be available to maintain the necessary feedwater flow in the event an operating feedwater pump trips. The reactor feedwater pumps are located outside the containment and are therefore not part of the safety-related portion of the CFS. The addition of the new reactor feedwater pump does not change the staff’s conclusion that the CFS complies with the SRP guidance, as documented in NUREG–1503. This change in the reactor feedwater pump design requires updating the GTS bases, as described below.

Finally, the modified CFS design incorporates a low-flow control valve in the feedwater pump discharge header to regulate the flow of feedwater during startup. The modified design retains the certified design’s feedwater pump bypass valve, which is equipped with a feedwater flow control to regulate the flow of feedwater during startup. The revised design continues to allow feedwater flow to bypass the feedwater pumps and be regulated by a low-flow control valve during startup. These modifications to the CFS feedwater flow control do not change the staff’s conclusion that the CFS complies with the SRP guidance, as documented in NUREG–1503. This change in the capability of the CFS to control feedwater flow during unit startup does not require updating the GTS.

In SER Subsection 16.4.6.8, the staff evaluated the effect of this departure on the TS bases. This departure requires changing the “Background” section of the bases for GTS 3.3.4.2 to state that there are four ASDs, one for each feedwater pump. This change is acceptable because it makes the bases for PTS 3.3.4.2 consistent with the proposed design for STP Units 3 and 4 feedwater systems, as described in SER Subsection 10.4.7.4. Further information is in the staff’s evaluation of this TS change in Subsection 16.4.6.8 of this SER.

With respect to applying the exemption criteria to the above identified changes to the GTS bases and the associated changes to FSAR Section 10.4.7, the staff finds that

1) the changes associated with this requested Tier 2 departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes represent an improvement to the CFS design that will not present an undue risk to public health and safety. The changes do not otherwise relate to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

2) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (iv) is present. These changes are made necessary due to an improvement to the CFS design. These improvements in design will improve plant reliability by providing standby feedwater capacity; therefore, the staff finds that there will be no decrease in safety from granting the exemption. Therefore, 10 CFR 50.12(a)(2) is satisfied.

_GROUP II – Changes of Intent to Generic Technical Specifications_

- STD DEP 16.2-1 Safety Limit Violation

The staff evaluated this departure in SER Subsection 16.4.2.2. This departure omits GTS 2.2.1, 2.2.4, and 2.2.5 and associated bases from the PTS and bases, because these provisions contain action requirements that are duplicative of the regulatory requirements in 10 CFR 50.36, 50.72, and 50.73. This departure also omits GTS 2.2.3 and associated bases from the PTS and bases. This provision requires making specified notifications within 24 hours of a safety limit violation. This notification action meets none of the TS-content requirements of 10 CFR 50.36 and therefore, may be omitted from the PTS. In Part 7 Section 2.2.2, “STD DEP Changes of Intent to the Technical Specifications,” of the COL application, the applicant stated that this notification action will be “relocated to a conduct-of-operations-type procedure developed in accordance with the procedures development plan.” The staff found this information acceptable. GTS 2.2.2 requires restoring compliance with all safety limits and inserting all insertable control rods within 2 hours. The departure renumbers GTS 2.2.2 accordingly in PTS 2.2, “Safety Limit Violations.” The changes made by this departure are consistent with the BWR/6 STS [standard TS], Revision 3 (NUREG–1434, “Standard Technical Specifications for General Electric Plants, BWR/6") and are therefore acceptable.

With respect to applying the exemption criteria to the above identified changes to the GTS and bases, the staff finds that

1) the changes associated with this requested GTS departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes will not present an undue risk to public health and safety because they do not decrease the GTS requirements but only remove unnecessary duplication. The changes do not otherwise relate to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

2) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present. The deleted GTS provisions are not necessary to ensure that the requirements of the corresponding regulations are applicable and will be met and, therefore, are not necessary to achieve the underlying purpose of the GTS. Therefore, 10 CFR 50.12(a)(2) is satisfied.

- STD DEP 16.3-78 LCO 3.3.6.1, Post Accident Monitoring Instrumentation

The staff evaluated this departure in SER Subsection 16.4.6.10. In this departure, the applicant proposes to omit the containment water level parameter (upper drywell water level and drywell sump level) from PTS Table 3.3.6.1-1, which lists the PAM functions required by LCO 3.3.6.1, because the containment water level parameter does not meet the criteria of 10 CFR 50.36 for inclusion in TS; as stated in a letter dated May 9, 1988, from T. E. Murley (NRC) to W. S. Wilgus (Babcock & Wilcox Owners Group) and R. F. Janecek (BWR Owners Group) (ML11264A057). This letter forwarded the report “NRC Staff Review of Nuclear Steam Supply System Vendor Owners Groups’ Application of the Commission’s Interim Policy Statement Criteria to Standard Technical Specifications.” This report, which is known as the split report, refers to PAM variable categories defined by RG 1.97 Revision 3.

As stated in the bases for GTS 3.3.6.1 (and consistent with the split report), only the PAM instrumentation for parameters that are classified as RG 1.97 “Type A” or “Category 1 non-type A” are required by 10 CFR 50.36 to be included in the TS (i.e., Criterion 3 or 4, respectively, of 10 CFR 50.36(c)(2)(ii)). Specifically, ABWR DCD Subsection 7.5.2.1(2)(e) and Table 7.5-2, “ABWR PAM Variable List,” classify the GTS 3.3.6.1 instrumentation functions for:

- upper drywell water level as Category 2 non-type A (Type D, Category 2 variable)

- drywell sump level as Category 3 non-type A (Type B and C, Category 3 variable)

In the FSER for the ABWR design certification rule (NUREG–1503), the staff concluded that the ABWR design included the necessary operator display information and therefore met the requirements of RG 1.97 for PAM instrumentation and TMI Action Plan Item I.D.2 for the safety parameter display system; it is therefore acceptable.

Based on the information from the ABWR DCD and NUREG–1503, the staff concluded in SER Subsection 16.4.6.10 that PAM Function 13, “Containment Water Level,” which includes drywell sump level instrumentation and upper drywell water level instrumentation, should not have been included in GTS Table 3.3.6.1-1 and may be omitted from PTS Table 3.3.6.1-1. Therefore, Departure STD DEP 16.3-78 is acceptable.

With respect to applying the exemption criteria to the above identified changes to GTS and bases, the staff finds that:

1) the changes associated with this requested TS departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes only amend the PAM function list in GTS 3.3.6.1 and the bases to be consistent with DCD Tier 2 Section 7.5 and NUREG–1503. The changes therefore will not present an undue risk to public health and safety. The changes do not otherwise relate to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

2) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present. The deleted provisions of the GTS are not necessary for PTS 3.3.6.1 to ensure the operability of necessary monitoring instrumentation in the event of a design-basis accident or event and therefore are not necessary to achieve the underlying purpose of the GTS. In addition, the staff finds no decrease in safety from granting the exemption. Therefore, 10 CFR 50.12(a)(2) is satisfied.

- STD DEP 16.5-1 Unit Responsibility

The staff evaluated this departure in SER Subsection 16.4.15.1. This departure removes “Mode 4 (cold shutdown)” from the requirement of GTS 5.1.2 so that PTS 5.1.2 states that “During any absence of the [SS] Shift Supervisor/Manager from the control room while the unit is in MODE 1, 2, or 3, an individual with an active Senior Reactor Operator (SRO) license shall be designated to assume the control room command function.” It also adds “Mode 4” to the requirement of GTS 5.1.2 so that PTS 5.1.2 also states that “During any absence of the [SS] Shift Supervisor/Manager from the control room while the unit is in MODE 4 or 5 [refueling], an individual with an active SRO license or Reactor Operator license shall be designated to assume the control room command function.” (There is a similar change in GTS 5.2.2.b so that PTS 5.2.2.b states that, “At least one licensed Reactor Operator (RO) shall be present in the control room when fuel is in the reactor. In addition, while the unit is in MODE 1, 2, or 3, at least one licensed Senior Reactor Operator (SRO) shall be present in the control room.”) In summary, with this departure the PTS will allow an RO, not only an SRO, to assume the control room command function while the unit is in Mode 4.

These changes are in accordance with 10 CFR 50.54(m)(2)(iii), which states, “When a nuclear power unit is in an operational mode other than cold shutdown or refueling, as defined by the unit's technical specifications, each licensee shall have a person holding a senior operator license for the nuclear power unit in the control room at all times. In addition to this senior operator, for each fueled nuclear power unit, a licensed operator or senior operator shall be present at the controls at all times."  Therefore, this departure is acceptable.

With respect to applying the exemption criteria to the above identified GTS departure, the staff finds that:

1) the changes associated with this requested GTS departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law.  The changes conform to the regulatory requirements of 10 CFR 50.54(m)(2)(iii) and therefore will not present an undue risk to public health and safety.  The changes do not otherwise relate to common defense and security.  Therefore, 10 CFR 50.12(a)(1) is satisfied.

2) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present.  Requiring an SRO to assume responsibility for the control room command in Mode 4 is not necessary to achieve the underlying purposes of the GTS responsibility and manning requirements, which include ensuring that the licensed operating staff necessary for safe operation of the unit are present in the control room during all operational modes; and the person with the responsibility for the control room command function has the appropriate qualifications.  Therefore, 10 CFR 50.12(a)(2) is satisfied.

- STD DEP 16.5-2 Unit Staff

The staff evaluated this departure in SER Subsection 16.4.15.2.  This departure replaces "auxiliary operator" in GTS 5.2.2.a with "non-licensed operator" in PTS 5.2.2.a. This change is administrative because the titles are equivalent, and "non-licensed operator" is the title that will be used for this staff position at STP Units 3 and 4.  The change is acceptable because the non-licensed operator staffing requirements are not reduced.

With respect to applying the exemption criteria to the above identified GTS departure, the staff finds that

1) the administrative change associated with this requested GTS departure is not inconsistent with the Atomic Energy Act or any other statute and is therefore authorized by law.  This change will not present an undue risk to public health and safety because it does not reduce any GTS unit staffing requirements.  This change does not otherwise relate to common defense and security.  Therefore, 10 CFR 50.12(a)(1) is satisfied.

2) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present.  Retaining the GTS position title for a non-licensed operator is not necessary to achieve the underlying purpose of GTS 5.2.2.a, which is to ensure that the number of qualified non-licensed operators on shift is sufficient to support safe operation of the unit in all operational modes.  Therefore, 10 CFR 50.12(a)(2) is satisfied.

- STD DEP 16.5-3 Technical Specification Bases Control Program

The staff evaluated this departure in SER Subsection 16.4.15.4. This departure updates the GTS 5.4.2.b description of the TS bases change process, which will govern changes to the PTS bases following the issuance of the COLs for STP Units 3 and 4 by removing the term “unreviewed safety question” because this term is no longer used in 10 CFR 50.59; and by clarifying that PTS bases changes are governed by the FSAR change requirements of 10 CFR 52.98, which means that whenever a change in the bases involves a change in the FSAR, the bases change is governed either by 10 CFR Part 52,Appendix A Section VIII or 10 CFR 50.59; according to the category of FSAR information to be revised (i.e., Tier 1, Tier 2, Tier 2*, or COL applicant-supplied site-specific information). These regulations also state that changes to PTS are governed by 10 CFR 50.90, so any associated bases change would be included in the staff's review of the license amendment request for the PTS change. If no FSAR or PTS change is involved, then 10 CFR 50.59 governs the bases change. The changes in this departure are acceptable because the revised bases control program is consistent with these regulations and the standard TS.

With respect to applying the exemption criteria to the above identified GTS departure, the staff finds that

1) the changes associated with this requested GTS departure are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law. The changes represent an improvement to GTS 5.4 so that PTS 5.4 is consistent with the current versions of 10 CFR 50.59 and 10 CFR 52.98. The changes therefore will not present an undue risk to public health and safety. The changes do not otherwise relate to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

2) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present. The changes only bring the PTS into agreement with the current versions of 10 CFR 50.59 and 10 CFR 52.98; therefore, retaining the former language would not have achieved the underlying purpose of the GTS. Therefore, 10 CFR 50.12(a)(2) is satisfied.

- STD DEP 16.5-4 Reporting Requirements

The staff evaluated this departure in SER Subsection 16.4.15.8.1. This departure revises GTS 5.7.1.1 to be consistent with 10 CFR 20.2206 by changing the due date from March 31st to April 30th for the annual report covering the activities of the unit. This change to the PTS is consistent with the regulations. Departure STD DEP 16.5-4 is therefore acceptable.

With respect to applying the exemption criteria to the above identified GTS departure, the staff finds that:

1) the change associated with this requested GTS departure is not inconsistent with the Atomic Energy Act or any other statute and is therefore authorized by law. The change will not present an undue risk to

public health and safety.  The change only brings the PTS into conformance with regulations.  The change does not otherwise relate to common defense and security.  Therefore, 10 CFR 50.12(a)(1) is satisfied.

2) special circumstances are present as specified in 10 CFR 50.12(a)(2).  Specifically, special circumstance (ii) is present.  The change brings the TS into agreement with 10 CFR 20.2206.  Therefore, retaining the former language is not necessary to achieve the underlying purpose of the GTS and 10 CFR 50.12(a)(2) is thus satisfied.

- STD DEP 16.5-5 Unit Staff – Working Hours

The staff evaluated this departure in SER Subsection 16.4.15.2.  This departure removes the working hour limits of GTS 5.2.2 in order to support compliance with 10 CFR Part 26 Subpart 1, “Managing Fatigue.”  The applicant stated that because work hour controls and fatigue management requirements have been incorporated into the NRC regulations, it is unnecessary to have work hour control requirements in the TS.  The GTS requirements related to unit staff work hour limits are superseded by the worker fatigue requirements in 10 CFR Part 26.  Departure STD DEP 16.5-5 is thus acceptable.

With respect to applying the exemption criteria to the above identified GTS departure, the staff finds that:

1) the change associated with this requested TS departure is not inconsistent with the Atomic Energy Act or any other statute and is therefore authorized by law.  The change will not present an undue risk to public health and safety.  By omitting the GTS redundant work controls, the change brings the PTS into conformance with regulations.  The change does not otherwise relate to common defense and security.  Therefore, 10 CFR 50.12(a)(1) is satisfied.

2) special circumstances are present as specified in 10 CFR 50.12(a)(2).  Specifically, special circumstance (ii) is present.  The GTS work control provisions omitted from the PTS are not necessary to ensure the implementation of proper unit staff work controls, which are required by regulation, and therefore are not necessary to achieve the underlying purpose of the GTS.  Therefore, 10 CFR 50.12(a)(2) is satisfied.

- STD DEP 16.5-6 Inservice Testing Program

The staff evaluated this departure in SER Subsection 16.4.15.6.6.  This departure updates GTS 5.5.2.6 to bring PTS 5.5.2.6 into agreement with current regulatory requirements in 10 CFR 50.55a by referencing the ASME OM Code instead of the ASME BPV Code; and to be consistent with the full description of the IST Program in the FSAR and the guidance in SRP Section 3.9.6.

The IST Program is categorized as an operational program by the guidance in Commission Paper SECY-05-0197, “Review of Operational Programs in a Combined License Application and Generic Emergency Planning Inspections, Tests, Analyses, and Acceptance Criteria,” and RG 1.206.  Based on this guidance, a COL applicant is expected to provide a full description of operational programs for the NRC to review in support of the COL application. The current NRC regulations in 10 CFR 50.55a incorporate by reference the ASME OM Code, with certain modifications to supersede Section XI of the ASME BPV Code for the development of IST programs for new nuclear power plants (and as operating plants update their IST Programs in accordance with the regulations). Furthermore, the standard TS for the General Electric BWR/6 plants, NUREG–1434 Revision 3.1 dated December 1, 2005, specify the use of the ASME OM Code for development of the IST Programs for BWR/6 plants. The staff finds the departure acceptable because it makes PTS 5.5.2.6 conform to 10 CFR 50.55a; and be consistent with the full description of the IST program in the FSAR and the guidance in SRP Section 3.9.6 and the standard TS.

With respect to applying the exemption criteria to the above identified GTS departure, the staff finds that:

1) the change associated with this requested GTS departure is not inconsistent with the Atomic Energy Act or any other statute and is therefore authorized by law. The change improves the IST program requirements of PTS 5.5.2.6 by bringing the incorporated GTS requirements up to date with the current regulations and guidance. The change will therefore not present an undue risk to public health and safety. The change does not otherwise relate to common defense and security. Therefore, 10 CFR 50.12(a)(1) is satisfied.

2) special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present. The change brings PTS 5.5.2.6 into agreement with 10 CFR 50.55a, and therefore retaining the former language is not necessary to achieve the underlying purpose of the GTS. Therefore, 10 CFR 50.12(a)(2) is satisfied.

*GROUP III – Generic Technical Specification Editorial Revisions and Clarifications*

The GTS departures in this group are not necessitated by underlying departures from DCD Tier 2 design information and do not change the intent of the affected provisions in the GTS and bases. The following table lists the GTS departures in this group and where their technical evaluations are presented in this SER.

| **Departure Number** | **Departure Title** | **SER Section** |
|---|---|---|
| STD DEP 16.2-2 | Safety Limits | 16.4.2.2 |
| STD DEP 16.3-1 | 3.0, Limiting Condition for Operation (LCO) Applicability | 16.4.3.2 |
| STD DEP 16.3-2 | LCO 3.0 and Surveillance Requirements (SRs) | 16.4.3.3 |
| STD DEP 16.3-4 | LCO 3.1.1, Shutdown Margin (SDM) | 16.4.4.1 |
| STD DEP 16.3-5 | LCO 3.4.1, Reactor Internal Pumps (RIPs) – Operating | 16.4.7.1 |
| STD DEP 16.3-6 | LCO 3.4.1, Reactor Internal Pumps (RIPs) – Operating | 16.4.7.1 |
| STD DEP 16.3-7 | LCO 3.4.2, Safety/Relief Valves (S/RVs) | 16.4.7.2 |
| STD DEP 16.3-8 | LCO 3.4.9, RCS Pressure and Temperature (P/T) Limits | 16.4.7.9 |
| STD DEP 16.3-9 | LCO 3.4.7 Alternate Decay Heat Removal | 16.4.7.7 |
| STD DEP 16.3-10 | LCO 3.5.1, ECCS – Operating | 16.4.8.1 |
| STD DEP 16.3-11 | 3.4.3 RCS Operational LEAKAGE | 16.4.7.3 |

| Departure Number | Departure Title | SER Section |
|---|---|---|
| STD DEP 16.3-13 | LCO 3.9.8, Residual Heat Removal (RHR) – “Low Water Level” Applicability | 16.4.12.8 |
| STD DEP 16.3-14 | LCO 3.9.2, Refuel Position Rod-Out Interlock | 16.4.12.2 |
| STD DEP 16.3-15 | LCO 3.9.5, Control Rod OPERABILITY – Refueling | 16.4.12.5 |
| STD DEP 16.3-16 | LCO 3.7.1, Reactor Building Cooling Water (RCW) System, Reactor Service Water (RSW) System, and Ultimate Heat Sink (UHS) – Operating,<br>LCO 3.7.2, RCW/RSW System and UHS – Shutdown and,<br>LCO 3.7.3, RCW/RSW System and UHS – Refueling | 16.4.10.1 |
| STD DEP 16.3-17 | LCO 3.10.12, Multiple Control Rod Drive Subassembly Removal – Refueling | 16.4.13.12 |
| STD DEP 16.3-18 | LCO 3.10.8 SHUTDOWN MARGIN (SDM) Test – Refueling | 16.4.13.8 |
| STD DEP 16.3-19 | LCO 3.10.4, Control Rod Withdrawal – Cold Shutdown | 16.4.13.4 |
| STD DEP 16.3-20 | LCO 3.10.4, Control Rod Withdrawal – Cold Shutdown | 16.4.13.4 |
| STD DEP 16.3-21 | LCO 3.10.5, Control Rod Drive (CRD) Removal – Refueling | 16.4.13.5 |
| STD DEP 16.3-23 | LCO 3.10.5, Control Rod Drive (CRD) Removal – Refueling | 16.4.13.5 |
| STD DEP 16.3-24 | LCO 3.10.3, Control Rod Withdrawal – Hot Shutdown Bases | 16.4.13.3 |
| STD DEP 16.3-25 | LCO 3.9.1, Refueling Equipment Interlocks | 16.4.12.1 |
| STD DEP 16.3-26 | LCO 3.10.2, Reactor Mode Switch Interlock Testing | 16.4.13.2 |
| STD DEP 16.3-27 | LCO 3.10.2, Reactor Mode Switch Interlock Testing | 16.4.13.2 |
| STD DEP 16.3-28 | LCO 3.10.1, In-Service Leak and Hydrostatic Testing Operation | 16.4.13.1 |
| STD DEP 16.3-29 | LCO 3.6.4.1, Secondary Containment | 16.4.9.13 |
| STD DEP 16.3-30 | LCO 3.6.4.1, Secondary Containment | 16.4.9.13 |
| STD DEP 16.3-31 | LCO 3.6.4.3, Standby Gas Treatment (SGT) System | 16.4.9.15 |
| STD DEP 16.3-32 | LCO 3.6.2.1, Suppression Pool Average Temperature | 16.4.9.7 |
| STD DEP 16.3-33 | LCO 3.6.2.1, Suppression Pool Average Temperature | 16.4.9.7 |
| STD DEP 16.3-34 | LCO 3.6.1.6, Wetwell-to-Drywell Vacuum Breakers | 16.4.9.6 |
| STD DEP 16.3-35 | LCO 3.9.6, Reactor Pressure Vessel (RPV) Water Level | 16.4.12.6 |
| STD DEP 16.3-36 | LCO 3.6.2.3, Residual Heat Removal (RHR) Suppression Pool Cooling | 16.4.9.9 |
| STD DEP 16.3-37 | LCO 3.6.2.3, Residual Heat Removal (RHR) Suppression Pool Cooling | 16.4.9.9 |
| STD DEP 16.3-40 | LCO 3.8.2, AC Sources – Shutdown | 16.4.11.2 |
| STD DEP 16.3-41 | LCO 3.8.2, AC Sources – Shutdown | 16.4.11.2 |
| STD DEP 16.3-42 | LCO 3.8.4, DC Sources – Operating | 16.4.11.4 |
| STD DEP 16.3-43 | LCO 3.6.1.1, Primary Containment | 16.4.9.1 |

| Departure Number | Departure Title | SER Section |
|---|---|---|
| STD DEP 16.3-45 | LCO 3.6.1.1, Primary Containment | 16.4.9.1 |
| STD DEP 16.3-46 | LCO 3.7.2, RCW, RSW, and UHS Applicability | 16.4.9.2, 16.4.9.3 |
| STD DEP 16.3-47 | LCO 3.7.4, Control Room Habitability Area (CRHA) – Emergency Filtration (EF) System | 16.4.10.4 |
| STD DEP 16.3-48 | LCO 3.7.4, Control Room Habitability Area (CRHA) – Emergency Filtration (EF) System | 16.4.10.4 |
| STD DEP 16.3-49 | LCO 3.8.1, AC Sources – Operating | 16.4.11.1 |
| STD DEP 16.3-50 | LCO 3.3.1.4, ESF Actuation Instrumentation | 16.4.6.4 |
| STD DEP 16.3-51 | LCO 3.8.3, Diesel Fuel Oil, Lube Oil, and Starting Air | 16.4.11.3 |
| STD DEP 16.3-52 | LCO 3.8.8, Inverters – Shutdown | 16.4.11.8 |
| STD DEP 16.3-55 | LCO 3.3.4.1, Anticipated Transient Without Scram (ATWS) and End-of-Cycle Recirculation Pump Trip (EOC-RPT) Instrumentation | 16.4.6.7 |
| STD DEP 16.3-57 | LCO 3.3.1.2, Reactor Protection System (RPS) and Main Steam Isolation Valve (MSIV) Actuation | 16.4.6.2 |
| STD DEP 16.3-58 | LCO 3.8.6, Battery Cell Parameters | 16.4.11.6 |
| STD DEP 16.3-59 | LCO 3.3.6.2, Remote Shutdown System | 16.4.6.11 |
| STD DEP 16.3-60 | LCO 3.3.6.2, Remote Shutdown System | 16.4.6.11 |
| STD DEP 16.3-61 | LCO 3.3.7.1, CRHA EF System Instrumentation | 16.4.6.12 |
| STD DEP 16.3-62 | LCO 3.3.8.1, Electric Power Monitoring | 16.4.6.13 |
| STD DEP 16.3-63 | LCO 3.3.8.2, Reactor Coolant Temperature Monitoring – Shutdown | 16.4.6.14 |
| STD DEP 16.3-64 | LCO 3.3.5.1, Control Rod Block Instrumentation | 16.4.6.9 |
| STD DEP 16.3-65 | LCO 3.3.5.1, Control Rod Block Instrumentation | 16.4.6.9 |
| STD DEP 16.3-66 | LCO 3.3.5.1, Control Rod Block Instrumentation | 16.4.6.9 |
| STD DEP 16.3-67 | LCO 3.3.5.1, Control Rod Block Instrumentation | 16.4.6.9 |
| STD DEP 16.3-69 | LCO 3.6.1.2, Primary Containment Air Locks | 16.4.9.2 |
| STD DEP 16.3-70 | LCO 3.6.1.2, Primary Containment Air Locks | 16.4.9.2 |
| STD DEP 16.3-73 | LCO 3.6.1.3, Primary Containment Isolation Valves (PCIVs) | 16.4.9.3 |
| STD DEP 16.3-74 | LCO 3.6.1.3, Primary Containment Isolation Valves (PCIVs) | 16.4.9.3 |
| STD DEP 16.3-75 | LCO 3.7.6, Main Condenser Offgas | 16.4.10.6 |
| STD DEP 16.3-76 | LCO 3.7.5, Control Room Habitability Area (CRHA) – Air Conditioning (AC) System | 16.4.10.5 |
| STD DEP 16.3-77 | LCO 3.3.6.1, Post Accident Monitoring (PAM) Instrumentation | 16.4.6.10 |
| STD DEP 16.3-78 | LCO 3.3.6.1, Post Accident Monitoring (PAM) Instrumentation | 16.4.6.10 |
| STD DEP 16.3-80 | LCO 3.8.1, AC-Sources – Operating | 16.4.11.1 |
| STD DEP 16.3-81 | LCO 3.3.1.2, Reactor Protection System (RPS) and Main | 16.4.6.2 |

| Departure Number | Departure Title | SER Section |
|---|---|---|
| | Steam Isolation Valve (MSIV) Actuation | |
| STD DEP 16.3-82 | LCO 3.3.1.2, Reactor Protection System (RPS) and Main Steam Isolation Valve (MSIV) Actuation | 16.4.6.2 |
| STD DEP 16.3-83 | LCO 3.3.1.3, Standby Liquid Control (SLC) and Feedwater Runback (FWRB) Actuation | 16.4.6.3 |
| STD DEP 16.3-84 | LCO 3.3.1.1, SSLC Sensor Instrumentation | 16.4.6.1 |
| STD DEP 16.3-85 | LCO 3.3.1.1, SSLC Sensor Instrumentation | 16.4.6.1 |
| STD DEP 16.3-86 | LCO 3.3.1.4, ESF Actuation Instrumentation | 16.4.6.4 |
| STD DEP 16.3-87 | LCO 3.3.1.4, ESF Actuation Instrumentation | 16.4.6.4 |
| STD DEP 16.3-91 | LCO 3.3.1.1, SSLC Sensor Instrumentation | 16.4.6.1 |
| STD DEP 16.3-92 | LCO 3.3.1.1, SSLC Sensor Instrumentation | 16.4.6.1 |
| STD DEP 16.3-93 | LCO 3.3.1.1, SSLC Sensor Instrumentation | 16.4.6.1 |
| STD DEP 16.3-94 | LCO 3.3.1.4, ESF Actuation Instrumentation | 16.4.6.4 |
| STD DEP 16.3-95 | LCO 3.2.3, Linear Heat Generation Rate (LHGR) (Non-GE Fuel) | 16.4.5.3 |
| STD DEP 16.3-96 | LCO 3.4.1, RIPs Operating | 16.4.7.1 |
| STD DEP 16.3-97 | Technical Specification Editorial Changes | 16.4 |
| STD DEP 16.3-98 | SR 3.3.1.1.4, DIVISION FUNCTIONAL TEST for SRNMs | 16.4.6.1 |
| STD DEP 16.3-99 | Bases Allowable Value Misstatements | 16.4.6.1 |
| STD DEP 16.3-100 | Setpoint Control Program Implementation | 16.4, 16.4.1.1, 16.4.6.4, 16.4.6.7, 16.4.6.8, 16.4.6.12, 16.4.6.13, 16.4.15.6.11 |
| STD DEP 16.3-101 | Bases LCO 3.3.5.1, REQUIRED ACTIONS A.1 and C.1 | 16.4.6.9 |
| STD DEP 16.3-102 | Bases SR 3.3.5.1.6 | 16.4.6.9 |
| STD DEP 16.3-103 | SR 3.8.1.15, Note 1 | 16.4.11.1 |
| STD DEP 16.3-104 | SR 3.3.4.2.2 - CHANNEL FUNCTIONAL TEST - Feedwater Pump and Main Turbine Trip Instrumentation | 16.4.6.8 |
| STD DEP 16.3-105 | LCO 3.3.1.1, ACTIONS Q.1, Q.2.1 and Q.2.2;<br>LCO 3.3.1.2, ACTIONS L.1, L.2.1 and L.2.2, and<br>LCO 3.6.1.3, ACTIONS A.1 and A.2 - Operation with an Isolated Main Steam Line | 16.4.6.1 |

Based on the evaluations in the referenced sections, the staff found the above departures acceptable. With respect to applying the exemption criteria to the above identified GTS departures, the staff finds that:

- the changes associated with these requested GTS departures satisfy 10 CFR 50.12(a)(1) because they

    - are not inconsistent with the Atomic Energy Act or any other statute and are therefore authorized by law

    - will not present an undue risk to public health and safety because the staff finds no decrease in safety from granting the exemptions, since the changes:

        - are editorial, clarifying, grammatical, or otherwise considered administrative, and thus do not affect the intent or technical content, except in a few cases to correct inconsistencies with DCD Tier 1 and Tier 2 information, which is consistent with the intent of such cases

        - improve the readability, implementation, and understanding of the affected provisions of the GTS and bases

    - do not otherwise relate to common defense and security

- special circumstances are present as specified in 10 CFR 50.12(a)(2). Specifically, special circumstance (ii) is present. There is no change to the intent of the TS and keeping the original language is not necessary to achieve the underlying purpose of the affected provisions of the GTS and bases. Therefore, 10 CFR 50.12(a)(2) is satisfied.

### 1.11S.2.5 Conclusion

NRC staff reviewed the information in the application and determined that the exemptions submitted by the applicant meet the requirements of 10 CFR 50.12(a)(1); and that special circumstances are present in accordance with 10 CFR 50.12(a)(2). Therefore, the staff's review concluded that the above exemptions comply with the requirements of 10 CFR 52.7; and these exemptions from the GTS and bases may be granted as allowed by 10 CFR 52 Appendix A, Section VIII.C.4.

## 1.11S.3 Exemption Associated with Special Nuclear Material (SNM) Material Control and Accounting (MC&A) Program

### 1.11S.3.1 Introduction

The STP COL application contains numerous applicant-proposed departures from the ABWR certified design. This section has been added to the SER in order to address the exemption evaluation pertaining to the applicant's October 27, 2011 (ML11307A239) request for an exemption from the requirements of 10 CFR 70.22(b) and 10 CFR 70.32(c); and in turn from 10 CFR 74.31, 10 CFR 74.41, and 10 CFR 74.51.This section does not exist in either the ABWR DCD or COL FSAR.

### 1.11S.3.2 Regulatory Basis

Pursuant to 10 CFR 70.17(a), the Commission may, upon application of any interested person or upon its own initiative, grant such exemptions from the requirements of the regulations in this part as it determines are authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest.

In addition, pursuant to 10 CFR 74.7, the Commission may, upon application of any interested person or upon its own initiative, grant such exemptions from the requirements of the regulations in this part as it determines are authorized by law and will not endanger life or property or the common defense and security, and are otherwise in the public interest.

Pursuant to 10 CFR 52.7, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 52. 10 CFR 52.7 further states that the Commission's consideration will be governed by 10 CFR 50.12, "Specific exemptions," which states that an exemption may be granted when:

- the exemptions are authorized by law, will not present an undue risk to public health or safety, and are consistent with the common defense and security; and

- when special circumstances are present. Special circumstances are present whenever, according to 10 CFR 50.12(a)(2);

    (i). application of the regulation in the particular circumstances conflicts with other rules or requirements of the Commission;

    (ii). or application 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; or

    (iii). compliance would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted, or that are significantly in excess of those incurred by others similarly situated; or

    (iv). the exemption would result in benefit to the public health and safety that compensates for any decrease in safety that may result from the grant of the exemption; or

    (v). the exemption would provide only temporary relief from the applicable regulation and the licensee or applicant has made good faith efforts to comply with the regulation; or

    (vi). there is present any other material circumstance not considered when the regulation was adopted for which it would be in the public interest to grant an exemption. If this condition is relied on exclusively for showing special circumstances, the exemption may not be granted until the Executive Director for Operations has consulted with the Commission.

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

### 1.11S.3.3 Summary of Application

In the letter dated October 27, 2011, the applicant stated that the provision of 10 CFR 70.22(b) requires an application for a license for SNM to include a full description of the applicant's program for MC&A of SNM under 10 CFR 74.31; 10 CFR 74.33, "Nuclear material control and accounting for uranium enrichment facilities authorized to produce special nuclear material of low strategic significance"; 10 CFR 74.41; and 10 CFR 74.51[16]. 10 CFR 70.32(c) requires a license authorizing the use of SNM to include and be subjected to a condition requiring the licensee to maintain and follow an SNM MC&A Program. However, 10 CFR 70.22(b), 10 CFR 70.32(c), 10 CFR 74.31, 10 CFR 74.41, and 10 CFR 74.51 include exceptions for nuclear reactors licensed under 10 CFR Part 50. The regulations applicable to the MC&A of SNM for nuclear reactors licensed under 10 CFR Part 50 are in 10 CFR Part 74 Subpart B; 10 CFR 74.11 through 10 CFR 74.19 excluding 10 CFR 74.17. The applicant stated that the purpose of this exemption request is to seek a similar exception for this COL under 10 CFR Part 52, such that the same regulations will be applied to the SNM MC&A Program as nuclear reactors licensed under 10 CFR Part 50. In addition, the applicant stated that the exemption request is evaluated under 10 CFR 52.7, which incorporates the requirements of 10 CFR 50.12.

The applicant stated that the subject exemption would allow nuclear reactors licensed under 10 CFR Part 52 to be explicitly excepted from the requirements of 10 CFR 70.22(b), 10 CFR 70.32(c), 10 CFR 74.31, 10 CFR 74.41, and 10 CFR 74.51. There is no technical or regulatory basis to treat nuclear reactors licensed under 10 CFR Part 52 differently from reactors licensed under 10 CFR 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 Federal Register 49352, 49372, 49436 (August 28, 2007)), applicants and licensees under 10 CFR 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 10 CFR Part 52. This regulation clearly indicates that plants licensed under 10 CFR Part 52 are to be treated no differently from plants licensed under 10 CFR Part 50, with respect to the substantive provisions in 10 CFR Chapter I (which includes 10 CFR Part 70 and 10 CFR Part 74). In particular, the exception for nuclear reactors licensed under 10 CFR Part 50 as in 10 CFR 70.22(b), 10 CFR 74.31, 10 CFR 74.41, or 10 CFR 74.51, should also be applied to reactors licensed under 10 CFR Part 52.

### 1.11S.3.4 Technical Evaluation

NRC staff reviewed the subject exemption that allows the applicant to have a similar exception for the COL under 10 CFR Part 52, such that the same regulations will be applied to the SNM MC&A Program as to nuclear reactors licensed under 10 CFR Part 50. All non-irradiated SNM used by the applicant will be Category III SNM; that is, SNM of low strategic significance as defined by 10 CFR 74.4; furthermore, no SNM used by the applicant will exceed a Uranium-235 isotope enrichment greater than 10 percent. The quantity of SNM will be documented, controlled, and communicated to the NRC as required by 10 CFR 74.13, 74.15, and 74.19(b) and (c); furthermore, the

[16] While not including an explicit exception for 10 CFR Part 50 reactors, 10 CFR 74.33 applies only to uranium enrichment facilities and thus is not directly implicated in this exemption request.

material control and accounting requirements Subpart B to Part 74 are still applicable. For these reasons, the staff has determined that this requested exemption will not present an undue risk to public health and safety. In addition, this exemption is consistent with the Atomic Energy Act and is authorized by law. The staff further found that granting this exemption will not adversely affect common defense and security. Furthermore, the application of the regulation in these particular circumstances is not necessary to achieve the underlying purpose of the rule. The intent of the rule is to ensure a program for the control and accounting of special nuclear material and the regulations applicable to Part 52 licensees cited above are adequate to do so. Because the exemption criteria in 10 CFR 50.12 are satisfied, the staff considers this request to also demonstrate that the exemption criteria in 10 CFR 52.7, 10 CFR 70.17(a), and 10 CFR 74.7 are satisfied. Therefore, the staff finds that the exemption from 10 CFR 70.22(b), 10 CFR 70.32(c), and in turn 10 CFR 74.31, 10 CFR 74.41, and 10 CFR 74.51 is justified.

### 1.11S.3.5 Conclusion

NRC staff reviewed the information in the letter dated October 27, 2011. The staff determined that the exemption associated with SNM and the M&CA Program submitted by the applicant meets the requirements of 10 CFR 50.12(a)(1), and special circumstances are present in accordance with 10 CFR 50.12(a)(2). Therefore, the staff's review concludes that the SNM exemption may be granted because it complies with the requirements of 10 CFR 52.7 and the exemption 10 CFR 70.22(b), 10 CFR 70.32(c), and in turn 10 CFR 74.31, 10 CFR 74.41, and 10 CFR 74.51.

## 1.11S.4 Not Used

## 1.11S.5 Request for Exemption Regarding Financial Qualification

### 1.11S.5.1 Introduction

This section does not exist in either the ABWR Design Control Document or in the COL Final Safety Analysis Report. NRC staff added this section to the safety evaluation in order to address the exemption evaluation regarding the applicant's request dated June 19, 2014 (ML14175A142), as superseded by its request dated May 18, 2015 (ML15140A077). NINA requested an exemption from the current financial qualification requirements in 10 CFR 52.77, 50.33(f), and Part 50 Appendix C to allow the use of a financial qualification standard similar to that in 10 CFR Part 70, in accordance with the SRM on SECY-13-0124 and the Draft Regulatory Basis for the proposed financial qualifications rulemaking.

Section 1.5S.2.1 of this SER discusses the SRM and the Draft Regulatory Basis in detail, and documents the staff's conclusion that NINA satisfies the standards in the Draft Regulatory Basis and meets the 10 CFR Part 70 standard of "appears to be financially qualified." This section of the SER addresses the regulatory criteria for exemptions. Because the application for STP Units 3 and 4 is a COL application per 10 CFR Part 52, exemptions are governed by 10 CFR 52.7, "Specific exemptions." This section references the exemption requirements in 10 CFR 50.12, "Specific exemptions." Section 50.12(a) states that the NRC may grant exemptions that are authorized by law, that will not present an undue risk to public health and safety, and that are consistent with common defense and security. Additionally, the NRC will not consider granting an exemption unless special circumstances are present as defined in 10 CFR 50.12(a)(2).

### 1.11S.5.2 Regulatory Basis

Pursuant to 10 CFR 52.7 and 10 CFR 50.12, upon receiving the application from any interested person or upon its own initiative, the Commission may grant exemptions from the requirements of 10 CFR 52.77, 10 CFR 50.33(f), and Appendix C to 10 CFR Part 50 when (1) the exemptions are authorized by law; they will not present an undue risk to public health and safety; and they are consistent with common defense and security; and (2) when special circumstances are present. In accordance with 10 CFR 50.12(a)(2)(ii), special circumstances exist 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…." In accordance with 10 CFR 50.12(a)(2)(vi), special circumstances, also exist when "[t]here is present any other material circumstance not considered when the regulation was adopted for which it would be in the public interest to grant an exemption."

### 1.11S.5.3 Summary of Application

The proposed action, as described in the applicant's request for an exemption to 10 CFR 52.77, 10 CFR 50.33(f), and Appendix C to 10 CFR Part 50 would replace the financial qualification requirements in these sections with a requirement that the applicants for STP Units 3 and 4 establish that they "appear to be financially qualified." The exemption would also require license conditions on financial qualifications. An issuance of this exemption would, in effect, allow the use of a financial qualification standard for the construction and operation of STP 3 and 4 similar to the standard in 10 CFR Part 70 for domestic licensing of special nuclear material.

In support of the exemption request, the applicant provided the following:

- information required by 10 CFR 52.7 and 10 CFR 50.12
- proposed license conditions governing financial qualifications
- NINA's Financial Capacity Plan (FCP) for Construction of STP Units 3 and 4

The applicant had previously provided construction and operational cost estimates as part of the COL application review.

The applicant stated that the current financial qualification requirements for construction have presented a challenge because the proposed STP Units 3 and 4 would be merchant plants and would therefore not have a cost of service rate regulation. This absence of cost of service rate regulation makes it difficult to obtain financing for construction and operation in advance of receiving a COL. As noted in Section 1.5S.2.1, both NEI and NINA raised this issue with the Commission in 2012.

In order to resolve the financial qualification issue for construction, and in conformance with the SRM for SECY-13-0124 and the draft regulatory basis described above, the applicant included in its exemption request a construction cost estimate, an FCP, and a proposed license condition that requires financial closing of a Project Finance prior to beginning construction. The applicant's proposed license condition would require the licensee to notify the NRC at least 60 days prior to its anticipated date of construction that the license condition has been fulfilled and that the following are available for inspection: (a) an updated cost estimate, (b) documentation of any material variances from the original cost estimate, and (c) documentation demonstrating that the licensee has secured financing to fund the updated cost estimate for construction. As discussed in Section 1.5S.2.1 of this SER, the staff has accepted this license condition with certain modifications to the proposed language.

In order to resolve the financial qualification issue for operation, and in conformance with the SRM for SECY-13-0124 and the Draft Regulatory Basis described above, the applicant has included in its exemption request an operational cost estimate and a proposed license condition that would require the licensee to notify the NRC at least 60 days prior to initial loading of fuel that the license condition has been fulfilled and that the following are available for inspection: (a) an updated cost estimate for each of the first five years of operations, (b) documentation of any material variances from the original cost estimate, and (c) documentation of sources of funds to cover each of the first 5 years of operations. As discussed in Section 1.5S.2.1 of this SER, the staff has accepted this license condition with certain modifications to the proposed language.

The applicant maintains that these license conditions are consistent with Commission financial qualification standards in 10 CFR Part 70.

### 1.11S.5.4 Technical Evaluation

Pursuant to 10 CFR 52.7 and 10 CFR 50.12(a), upon receiving an application from any interested person or upon its own initiative, the Commission may grant exemptions from the requirements of 10 CFR Parts 50 and 52 when (1) the exemption is authorized by law and will not present an undue risk to the public health and safety and is consistent with the common defense and security; and (2) when special circumstances are present.

This action would exempt the applicant from the financial qualification requirements in 10 CFR 52.77, 10 CFR 50.33(f), and Appendix C to 10 CFR Part 50 as these requirements are applied to the construction and operation of STP Units 3 and 4. As stated above, 10 CFR 52.7 and 10 CFR 50.12(a) allow the NRC to grant exemptions from these financial requirements. This exemption evaluation focuses on the applicant's proposal to use the 10 CFR Part 70 standard of "appears to be financially qualified" in accordance with the Draft Regulatory Basis. The staff's conclusion that this proposed 10 CFR Part 70 standard has been met is documented in Section 1.5S.2.1.

Financial qualification regulations are intended to protect public health and safety. Specifically, the objective is to prevent safety lapses caused by underfunding during the construction or operation of a nuclear power plant. Over years of regulatory experience, and as documented in SECY-13-0124, the staff has not found a direct correlation between licensees' pre-licensing financial reviews and later safe construction. Furthermore, the staff has not found that regulated utilities, which are not subject to the same type of financial pressures as non-regulated utilities, operate more safely than non-regulated utilities. The reasons for this are manifold. The NRC maintains a number of programs and processes that more directly ensure safe plant construction and operation. These include a detailed technical licensing review, the construction reactor oversight process, the reactor oversight process, the resident inspector program, the operating experience program, the vendor inspection program, and the quality assurance inspection program. These direct programs and processes have evolved over the last 40 years, thus reducing the need to rely on financial qualifications as a possible indirect measure for predicting safety. Details regarding these programs and processes are discussed earlier in this safety evaluation in Section 1.5S.2.1.

The staff concludes that NINA's exemption request satisfies the following provisions in 10 CFR 50.12(a):

1. The exemption is authorized by law. The Commission has the authority to issue NINA's requested exemption. The exemption would not conflict with any provision of the AEA or any other law. In particular, the NRC has broad discretion to prescribe requirements for financial qualifications, as provided in Section 182a. of the AEA.

2. The exemption does not present an undue risk to the public health and safety. The exemption does not pertain to any NRC safety requirements that directly govern the design, construction, and operation activities for STP Units 3 and 4. The NRC has not found a direct correlation between licensees' pre-licensing financial reviews and later safe construction or operating performance. In addition, the NRC maintains a number of programs and processes that more directly ensure safe plant construction and operation. These include a detailed technical licensing review, the construction reactor oversight process (cROP), the reactor oversight process (ROP), the resident inspector program, the operating experience (OpE) program, the vendor inspection program (VIP), and the quality assurance (QA) inspection program. As explained in more detail in Section 1.5S.2.1, these direct programs and processes have evolved over the last 40 years, thus reducing the need to rely on the FQ as a possible indirect measure of safety. Moreover, per the previously cited SRM, the Commission, in 2014, approved Option 2 in SECY-13-0124 and directed staff to change the current reactor financial qualification standard of "reasonable assurance" to the less stringent 10 CFR Part 70 standard of "appears to be financially qualified." In approving this approach, the Commission decided that the existing financial qualification requirements were not necessary to protect public health and safety. More discussion on this can be found in staff's Draft Regulatory Basis, including how the proposed new financial qualification requirements can be met by power reactor applicants.

   Staff has evaluated NINA's construction cost estimate, its financial capacity, and its operations cost projections against the staff's Draft Regulatory Basis developed in response to the SRM. Staff concludes that NINA's construction cost estimate for the project is reasonable. Additionally, staff concludes that, per its review of NINA's financial capacity as presented in its FCP, NINA has an understanding of the complexities of financing a large nuclear power plant, the challenges in raising capital, and the need for ensuring financing before beginning reactor construction. NINA appears to have a good understanding of the funding requirements for the STP Units 3 and 4 project, and it and its consultants have experience in finding financial backers and securing required capital. Further, staff concludes that NINA's cost projections for operations appear reasonable. Accordingly, the applicants appear to be financially qualified.

Furthermore, the license conditions as discussed would require 1) NINA to provide before construction of STP Units 3 and 4 documentation demonstrating that it has secured financing to meet the updated cost estimate for constructing the proposed units; and 2) NINA to provide before the operation of STP Units 3 and 4 documentation demonstrating sources of funds to cover each of the first 5 years of operations. The staff concludes that if the necessary funding is not secured, the plant will not be constructed or operated; thereby ensuring that the exemption will not present a nuclear safety issue.

3. The exemption is consistent with common defense and security. The exemption pertains only to the financial qualification requirements for STP Units 3 and 4 and will not pertain to any NRC security requirements that directly govern security-related activities for STP Units 3 and 4. In addition, as discussed above, the applicant has met the 10 CFR Part 70 standards as implemented in the Draft Regulatory Basis. Furthermore, the license conditions as discussed would require 1) NINA to provide before the construction of STP Units 3 and 4, documentation demonstrating secured financing to meet the updated cost estimates for the project; and 2) NINA to provide before the operation of STP Units 3 and 4 documentation demonstrating secured sources of funds to cover each of the first 5 years of operations. The staff concludes that those conditions ensure that common defense and security will not be impacted and therefore, the exemption is consistent with common defense and security.

4. Special circumstances are present. 10 CFR 50.12(a)(2) states that special circumstances are present whenever any one of six listed circumstances exist. The staff concluded that there are special circumstances in the form described in 10 CFR 50.12(a)(2)(vi), as described below. Since 10 CFR 50.12(a)(2)(vi) is being relied on exclusively for satisfying paragraph 10 CFR 50.12(a)(2), the exemption may not be granted until the Executive Director for Operations has consulted with the Commission. This consultation will occur through the SECY paper supporting the mandatory hearing.

The staff concluded that the following special circumstance applies here with regard to the consideration of an exemption to current financial qualification requirements:

Section 50.12(a)(2)(vi) applies because there is a material circumstance not considered when the regulation was adopted for which it would be in the public interest to grant an exemption. Specifically, the Commission in the SRM on SECY-13-0124 directed the staff to initiate a rulemaking to amend the financial qualification requirements of 10 CFR Part 50 and to apply financial qualification standards similar to those in 10 CFR Part 70, including an allowance for the use of license conditions to address financial qualifications. Current NRC regulations have specific requirements that must be met in order to demonstrate that initial license applicants have reasonable assurance of financial qualifications as a condition precedent to the receipt of a license. After closely examining this issue, the NRC has determined that the current detailed Part 50 financial qualification standards go well beyond the NRC's mandate of ensuring safety. Also, the nuclear industry asserts that the current Part 50 standards have created an unnecessary impediment to initial licensing for merchant applicants that cannot be resolved absent a change in Commission policy or regulation. The regulatory objective of the rulemaking is to remove an unnecessary impediment to licensing while ensuring the protection of the public health and safety. The NRC proposes accomplishing this by amending the standard of 10 CFR Part 50.33(f) from "reasonable assurance of obtaining the funds" for construction and operations to a standard of "appears to be financially qualified." Staff issued a Draft Regulatory Basis for the Rulemaking on Financial Qualifications for Reactor Licensing to accomplish this objective, and the applicant has met the standards proposed by staff in the regulatory basis. Moreover, none of the comments received on the Draft Regulatory Basis undermine the basis for granting an exemption to the applicant. In fact, comments received by the NRC expressed the view that NRC's financial qualification requirements should be further reduced or eliminated. Consequently, the special circumstance described in 10 CFR 50.12(a)(2)(vi) applies to this exemption request.

#### 1.11S.5.5 Conclusion

The NRC staff has determined that the exemption, as proposed by the applicant in a letter dated June 19, 2014 and superseded by a letter dated May 18, 2015, is authorized by law, does not present an undue risk to the public health and safety and is consistent with the common defense and security. The staff further concludes that special circumstances are present in accordance with 10 CFR 50.12(a)(2)(vi). Based on this discussion, staff finds that this exemption request should be granted to the applicant by the NRC. Per the previously cited SRM, the NRC staff must notify the Commission by memorandum five business days in advance of issuing any such exemption. The NRC staff will do this through the SECY paper supporting the mandatory hearing.

**APPENDICES 1A and 1AA Response to Three Mile Island (TMI) Related Matters, and Plant Shielding to Provide Access to Vital Areas and Protective Safety Equipment for Post-Accident Operation**

## 1A-1AA.1 Introduction

Appendix 1A of the STP Units 3 and 4 FSAR addresses TMI-related matters; and Appendix 1AA addresses plant shielding to provide access to vital areas and protective safety equipment for post-accident operations.

## 1A-1AA.2 Summary of Application

Appendices 1A and 1AA of the STP Units 3 and 4 COL FSAR Revision 12 incorporate by reference Appendices 1A and 1AA of the certified ABWR DCD Revision 4, referenced in 10 CFR Part 52, Appendix A.

In addition, in FSAR Appendices 1A and 1AA, the applicant provides the following:

Appendix 1A – Response to TMI Related Matters

<u>Tier 1 Departures</u>

- STD DEP T1 2.3-1 — Deletion of MSIV Closure and Scram on High Radiation

This departure evaluates the deletion of the reactor scram and the MSIV closure on the high main steamline radiation monitor trip. This departure affects TMI Action Plan III.D.1.1(1).

- STD DEP T1 2.4-3 — RCIC Turbine/Pump

This departure evaluates an alternate design for the reactor core isolation cooling (RCIC) turbine/pump. This departure affects TMI Action Plan III.K.3(15).

- STD DEP T1 2.14-1 — Hydrogen Recombiner Requirement Elimination

This departure evaluates the removal of hydrogen recombiners and associated components. This departure affects TMI Action Plans II.B.3, II.E.4.3, II.F-3, and III.D.1.1(1).

<u>COL License Information Items</u>

Appendix 1A.3, “COL License Information,” addresses COL License Information Items 1.5 through 1.12:

- COL License Information Item 1.5 — Emergency Procedures and Emergency Procedures Training Program

This COL license information item addresses the requirement to develop and implement emergency procedures based on the emergency procedures guidelines (EPGs) before fuel loading (ABWR DCD, Tier 2 Subsection 1A.2.1). The emergency procedures will be consistent with the plant operating procedure development plan in Section 13.5. This item is in response to TMI Action Plan I.C.1.3. (Commitment [COM] 1A-1).

- COL License Information Item 1.6 Review and Modify Procedures for Removing Safety-Related Systems from Service

This COL license information item addresses administrative procedures to be developed by the licensee before fuel loading, which will require approval for the performance of surveillance tests and maintenance for safety-related systems, including equipment removal from service and return to service to assure that the operability status is known. These procedures will be consistent with the plant operating procedure development plan in Section 13.5. This item is in response to TMI Action Plan II.K.1.(10). (COM 1A-2).

- COL License Information Item 1.7 In-Plant Radiation Monitoring

This COL license information item addresses equipment, training, and procedures necessary to accurately determine the presence of airborne radioiodine in areas within the plant, where plant personnel may be present during an accident, consistent with Section 13.5. The equipment will be specified and the training and procedures will be consistent with FSAR Section 12.3, “Radiation Protection Design Features.” This item is in response to TMI Action Plan II.D.3.3 (3). (COM 1A-3).

- COL License Information Item 1.8 Reporting Failures of Reactor System Relief Valves

This COL license information item addresses administrative procedures to be developed by the licensee before fuel loading, which will direct that failures of reactor system relief valves be reported in the licensee's annual report to the NRC. These procedures will be consistent with the plant operating procedure development plan in Section 13.5. This item is in response to TMI Action Plan II.K.3 (3). (COM 1A-4).

- COL License Information Item 1.9 Report on ECCS Outages

This COL license information item addresses administrative procedures to be developed by the licensee before fuel loading, which direct that instances of the unavailability of the ECCS because of component failure, maintenance outage (both forced or planned), or testing shall be collected and reported to the NRC annually. These reports may consist of the performance indicator report for mitigating systems periodically provided to the NRC as part of the Reactor Oversight Process. These procedures will be consistent with the plant operating procedure development plan in Section 13.5. This item is in response to TMI Action Plan II.K.3 (17). (COM 1A-5).

- COL License Information Item 1.10 Procedures for Reactor Venting

This COL license information item addresses EPGs to be written for the ABWR that will be applicable to STP Units 3 and 4. The ABWR EPGs are in Appendix 18A. The operator procedures will use the ABWR EPGs and will be developed before fuel loading. These procedures will be consistent with Section 13.5. This item is in response to TMI Action Plan II.B.1. (COM 1A-6).

- COL License Information Item 1.11 Testing of SRV and Discharge Piping

Testing of the SRVs and discharge piping is included in the ITP described in Section 14.2. This item is in response to TMI Action Plan II.D.1.

- COL License Information Item 1.12 RCIC Bypass Start System Test

With respect to Departure STD DEP T1 2.4-3, the applicant removes the RCIC bypass line and valve. Therefore the applicant replaces the RCIC bypass start system test with the RCIC start test. This modified RCIC start test is included in the Initial Test Program (ITP) described in Section 14.2. This item is in response to TMI Action Plan II.K.3 (15).

Appendix 1AA – Plant Shielding to Provide Access to Vital Areas and Protective Safety Equipment for Post-Accident Operation

<u>Tier 1 Departures</u>

- STD DEP T1 2.4-1 Residual Heat Removal System and Spent Fuel Pool Cooling

This departure updates entries in Table 1AA-2 to add equipment to the list. The entries are consistent with the need to maintain spent fuel pool cooling during post-accident operations.

- STD DEP T1 2.14-1 Hydrogen Recombiner Requirements Elimination

This departure updates entries in Table 1AA-3 that are consistent with design changes associated with the removal of hydrogen recombiners and associated equipment.

<u>Tier 2 Departures Not Requiring Prior NRC Approval</u>

- STD DEP 1AA-1 Shielding Design Review

This departure allows for changes in the Appendix to reflect revisions to the integrated doses for the environmental qualification of safety-related equipment.

- STD DEP Admin

This departure updates entries in Table 1AA-2 that are consistent with the affected changes to the ABWR DCD.

## 1A-1AA.3 Regulatory Basis

The regulatory basis of the information incorporated by reference is in NUREG–1503. In addition, the relevant requirements of the Commission regulations and associated acceptance criteria for reviewing COL license information and supplemental information are in Section 1.0 of NUREG–0800.

In accordance with Section VIII of Appendix A to Part 52, the applicant identifies Tier 1 and Tier 2 departures. Tier 1 departures require prior NRC approval and are subject to the requirements of 10 CFR Part 52, Section VIII.A.4. Tier 2 departures that do not require prior NRC approval are subject to the requirements of 10 CFR Part 52, Appendix A, Section VIII.B.5, which are similar to the requirements in 10 CFR 50.59.

## 1A-1AA.4Technical Evaluation

As documented in NUREG–1503, NRC staff reviewed and approved Appendices 1A and 1AA of the certified ABWR DCD. The staff reviewed Appendices 1A and1AA of the STP Units 3 and 4 COL FSAR and checked the referenced ABWR DCD to ensure that the combination of the information in the COL FSAR and the information in the ABWR DCD appropriately represents the complete scope of information relating to this review topic.[17] The staff's review confirmed that the information in the application and the information incorporated by reference address the required information relating to TMI-related matters and plant shielding to provide access to vital areas and protective safety equipment for post-accident operation.

<u>Tier 1 Departures</u>

The following Tier 1 departures identified by the applicant in this section require prior NRC approval in the form of an exemption and the full scope of their technical impact may be evaluated in the other sections of this SER. For more information, refer to COL application Part 07, Section 5.0 for a listing of all FSAR sections affected by these Tier 1 departures. In addition, compliance with 10 CFR Part 52 Appendix A Section VIII.A.4, for these Tier 1 departures is addressed by the staff in Section 1.11S.1 of to this Chapter.

- STD DEP T1 2.3-1 Deletion of MSIV Closure and Scram on High Radiation

With respect to this section of the FSAR, the applicant has identified that Departure STD DEP T1 2.3-1 results in revisions to Section 1A.2.34. Within the review scope of this section, the staff found that this departure is editorial in nature and is therefore acceptable.

- STD DEP T1 2.4-1 Residual Heat Removal System and Spent Fuel Pool Cooling

With respect to this section of the FSAR, the applicant has identified that Departure STD DEP T1 2.4-1 results in revisions to Section 1AA.5.1.2 and Table 1AA-2 of the ABWR DCD. Within the review scope of this section, the staff found that this departure is editorial in nature and is therefore acceptable.

- STD DEP T1 2.4-3 RCIC Turbine/Pump

With respect to this section of the FSAR, the applicant has identified that Departure STD DEP T1 2.4-3 results in revisions to Sections 1A.2.23 and 1A.2.34 of the ABWR DCD. Within the review scope of this section, the staff found that this departure is editorial in nature and is therefore acceptable.

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[17] See *"Finality of Referenced NRC Approvals"* in SER Section 1.1.3, for a discussion on the staff's review related to verification of the scope of information to be included in a COL application that references a design certification.

- STD DEP T1 2.14-1 Hydrogen Recombiner Requirements Elimination

With respect to this section of the FSAR, the applicant has identified that Departure STD DEP T1 2.14-1 results in revisions to Sections 1A.2.7, 1A.2.13, 1A.2.17, 1A.2.34, 1AA.3.2, 1AA.5.1.3 and Table 1AA-3. Within the review scope of this section, the staff found that this departure is editorial in nature and is therefore acceptable.

Tier 2 Departures Not Requiring Prior NRC Approval

The following Tier 2 departures not requiring NRC approval identified by the applicant in this section may also be addressed in other sections of this SER. For more information, refer to COL application Part 07, Section 5.0 for a listing of all FSAR sections affected by these departures.

- STD DEP 1AA-1 Shielding Design Review

With respect to this section of the FSAR, the applicant has identified that Departure STD DEP 1AA-1 results in revisions to Section 1AA-2. The applicant's evaluation in accordance with 10 CFR Part 52 Appendix A Section VIII.B.5, determined that this departure does not require prior NRC approval. Within the review scope of this section, the staff found it reasonable that this departure does not require prior NRC approval.

- STD DEP Admin

The applicant defines administrative departures as minor corrections, such as editorial or administrative errors in the referenced ABWR DCD (e.g., misspellings, incorrect references, table headings, etc.). The applicant identifies that this administrative departure updates entries in Table 1AA-2 that are consistent with the affected changes to the ABWR DCD. NRC staff found that this administrative departure does not affect the presentation of any design discussion or qualification of design margin.

The applicant's evaluation in accordance 10 CFR Part 52 Appendix A Section VIII.B.5, determined that this departures does not require prior NRC approval. Within the review scope of this section, the staff found it reasonable that this departure does not require prior NRC approval.

The applicant's process for evaluating departures and other changes to the DCD is subject to NRC inspections.

COL License Information Items

The staff reviewed the applicant's resolution to COL License Information Items 1.5 through 1.12, and found that the applicant has addressed these items, as required by the DCD. The staff found the applicant's Commitments (i.e., COM 1A-1 through COM 1A-6) reasonable and sufficient. Technical evaluations of these items are in the appropriate sections of this SER.

## 1A-1AA.5Post Combined License Activities

The applicant identifies the following commitments:

- Commitment (COM 1A-1) – Develop and implement emergency procedures based on the emergency procedure guidelines before fuel loading.

- Commitment (COM 1A-2) – Develop, before fuel loading, administrative procedures that require approval for the performance of surveillance tests and maintenance for safety-related systems, including equipment removal from service and return to service.

- Commitment (COM 1A-3) – Provide equipment, training, and procedures to accurately determine the presence of airborne radioiodine in areas within the plant where plant personnel may be present during an accident.

- Commitment (COM 1A-4) – Provide administrative procedures, before fuel loading, which require that failures of reactor system relief valves be reported in the licensee's annual report to the NRC.

- Commitment (COM 1A-5) – Provide administrative procedures, before fuel loading, which require that instances of ECCS unavailability because of component failure, maintenance outage (both forced or planned), or testing shall be collected and reported to the NRC annually.

- Commitment (COM 1A-6) – Develop operator procedures that use the ABWR emergency procedure guidelines for reactor venting, before fuel loading.

## 1A-1AA.6 Conclusion

The NRC staff's finding related to information incorporated by reference is in NUREG–1503. NRC staff reviewed the application and checked the referenced DCD. The staff's review confirmed that the applicant has addressed the required information, and no outstanding information is expected to be addressed in the COL FSAR related to this section. Pursuant to 10 CFR 52.63(a)(5) and 10 CFR Part 52 Appendix A Section VI.B.1, all nuclear safety issues relating to the "TMI Related Matters" and "Plant Shielding to Provide Access to Vital Areas and Protective Safety Equipment for Post-Accident Operation," that were incorporated by reference have been resolved.

In addition, the staff concluded that the relevant information in the COL application is acceptable, satisfies NRC regulations, and meets the requirements defined in the ABWR DCD, and 10 CFR Part 52, Appendix A. The staff's conclusion is based on the following:

- The staff reviewed the proposed Tier 1 departures with respect to Commission rules and regulations. For the purpose of the staff's Section 1.A-1AA review, the staff determined that these departures are consistent with Commission rules and regulations and have no adverse impact on public health and safety.

- For the purposes of the staff's Section 1A-AA review, the staff found that for all of the "Tier 2 Departures Not Requiring Prior NRC Approval" identified by the applicant, it is reasonable that they do not require prior NRC approval per 10 CFR Part 52 Appendix A, Section VIII.B.5.

- Within the review scope of this section, the staff's review confirmed that the applicant has adequately addressed COL License Information Items 1.5 through 1.12 in accordance with Section 1.0 of NUREG–0800.

# Appendix 1B Not Used

This appendix is not used in either the ABWR DCD or the applicant's FSAR.

# Appendix 1C ABWR Station Blackout Considerations

## 1C.1 Introduction

This FSAR appendix describes: (a) how the ABWR design addresses station blackout (SBO) events; (b) how the ABWR design complies with 10 CFR 50.63 SBO requirements; and (c) where supporting documentation to these conformances exist in Tier 2.

## 1C.2 Summary of Application

Appendix 1C of the STP Units 3 and 4 COL FSAR, Revision 12, incorporates by reference Appendix 1C of the certified ABWR DCD Revision 4.

In addition, in FSAR Appendix 1C, the applicant provides the following:

<u>Tier 2* Departure</u>

- STD DEP 1.8-1 — Tier 2* Codes, Standards, and Regulatory Guide Edition Change

The applicant updates entries in Table 1.C-3 to reflect the affected changes in codes, standards, and RGs in the ABWR DCD.

<u>Tier 2 Departure Requiring Prior NRC Approval</u>

- STD DEP 8.3-1 — Plant Medium Voltage Electrical System Design

This departure changes the plant's medium voltage electrical system from a single 6.9 kilovolt (kV) system to a dual-voltage 13.8 kV and 4.16 kV system and affects the TS related to the design change.

<u>COL License Information Items</u>

- COL License Information Item 1.13 — Station Blackout Procedures

This COL license information item addresses the requirement to provide procedures for SBO events, including the use of a combustion turbine generator (CTG). The applicant has identified that the SBO procedures will be developed consistent with the plant operating procedure development plan identified in FSAR Section 13.5 (COM 1C-1).

## 1C.3 Regulatory Basis

The regulatory basis of the information incorporated by reference is in NUREG–1503. In addition, the relevant requirements of the Commission regulations for the SBO, and the associated acceptance criteria, are in Section 8.4 of NUREG–0800.

In accordance with Section VIII of Appendix A to Part 52, the applicant identifies Tier 2*and Tier 2 departures. Tier 2* departures require prior NRC approval and are subject to the requirements of 10 CFR Part 52 Appendix A, Section VIII.B.6. Tier 2 departures that affect TS require prior NRC approval and are subject to the requirements of 10 CFR Part 52 Appendix A, Section VIII.C.4.

## 1C.4 Technical Evaluation

As documented in NUREG–1503, NRC reviewed and approved Appendix 1C of the certified ABWR DCD. The staff reviewed Appendix 1C of the STP Units 3 and 4 COL FSAR, and checked the referenced ABWR DCD to ensure that the combination of the information in the COL FSAR and the information in the ABWR DCD appropriately represents the complete scope of information relating to this review topic.[18] The staff's review confirmed that the information in the application and the information incorporated by reference address the required information relating to ABWR station blackout considerations.

Additional review for the site-specific SBO is in Section 8.4 of this SER. The staff reviewed the following information in the COL FSAR:

<u>Tier 2* Departure</u>

The following Tier 2* departure identified by the applicant in this section requires prior NRC approval, and the full scope of its technical impact may be evaluated in the other sections of this SER. For more information, refer to COL application Part 07, Section 5.0 for a listing of all FSAR sections affected by this departure.

- STD DEP 1.8-1 — Tier 2* Codes, Standards, and Regulatory Guide Edition Change

With respect to this FSAR appendix, the applicant has identified that Departure STD DEP 1.8-1 results in revisions to Section 1C.2.2.2 and Table 1C-3 in the ABWR DCD. Within the review scope of this section, the staff found that this departure is editorial in nature and is therefore acceptable.

<u>Tier 2 Departure Requiring Prior NRC Approval</u>

The following Tier 2 departure identified by the applicant in this section requires prior NRC approval, and the full scope of its technical impact may be evaluated in the other sections of this SER accordingly. For more information, refer to COL application Part 07, Section 5.0 for a listing of all FSAR sections affected by this departure.

- STD DEP 8.3-1 — Plant Medium Voltage Electrical System Design

With respect to this FSAR appendix, the applicant has identified that Departure STD DEP 8.3-1 results in revisions to Subsections 1C.2.2.2, 1C.2.3.1.1, 1C.2.3.1.3, 1C.2.3.2

[18] See *"Finality of Referenced NRC Approvals"* in SER Section 1.1.3, for a discussion on the staff's review related to verification of the scope of information to be included in a COL application that references a design certification.

and Tables 1C-1, 1C-2, and 1C-3 in the ABWR DCD. Within the review scope of this section, the staff found that this departure is editorial in nature and is acceptable.

<u>COL License Information Item</u>

- COL License Information Item 1.13 Station Blackout Procedures

The staff reviewed the applicant's resolution to COL License Information Item 1.13, and found that the applicant has addressed this item, as required by the DCD. The staff found the applicant's commitment is reasonable and sufficient within the review scope of this section. Further technical evaluation of this item is in SER Section 13.5.

## 1C.5 Post Combined License Activities

The applicant identifies the following commitment:

Commitment (COM 1C-1) – The applicant is required to develop operator procedures for Station Blackout (SBO) events including the use of a combustion turbine generator (CTG), before fuel loading, which use the ABWR plant operating procedures.

## 1C.6 Conclusion

The NRC staff's finding related to information incorporated by reference is in NUREG–1503. NRC staff reviewed the application and checked the referenced DCD. The staff's review confirmed that the applicant has addressed the required information relating to "ABWR Station Blackout Considerations," and no outstanding information is expected to be addressed in the COL FSAR related to this section. Pursuant to 10 CFR 52.63(a)(5) and 10 CFR Part 52 Appendix A Section VI.B.1, all nuclear safety issues relating to ABWR station blackout procedures that were incorporated by reference have been resolved.

In addition, the staff concluded that the relevant information in the COL FSAR is acceptable, satisfies NRC regulations, and meets the requirements defined in the ABWR DCD and 10 CFR Part 52, Appendix A. The staff's conclusion is based on the following:

- For purposes of the staff's Section 1C review, the staff found that departures STD DEP 1.8-1 and STD DEP 8.3-1 are acceptable and are consistent with NRC rules and regulations.

- Within the review scope of this section, the staff confirmed that the applicant has adequately addressed COL License Information Item 1.13 in accordance with Section 8.4 of NUREG–0800. Additional reviews and conclusions are provided in Section 8.4 of this SER.