## PMSTPCOL NPEmails

**From:** Joseph, Stacy
**Sent:** Wednesday, January 26, 2011 8:03 AM
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**Cc:** 'Elton, Loree'
**Subject:** CH. 16 ASER for PROPRIETARY Review
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Attached is the STP Units 3 and 4 Advanced SER for Chapter 16. Please review the document for proprietary information and let me know within 10 business days if any of the material needs to be redacted.

Thank you,

Stacy Joseph
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U. S. Nuclear Regulatory Commission
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# 16.0 TECHNICAL SPECIFICATIONS

## 16.1 Introduction

Technical Specifications (TS) impose limits, operating conditions, and other requirements on reactor facility operation for the protection of public health and safety. The South Texas Project (STP) Units 3 and 4 plant-specific TS (PTS) are derived from the analyses and evaluations in the advanced boiling-water reactor (ABWR) design control document (DCD) and the STP Units 3 and 4 Final Safety Analysis Report (FSAR). In accordance with the applicable regulations, the STP Nuclear Operating Company (STPNOC or the applicant) has provided PTS and bases for STP Units 3 and 4 in Chapter 16, "Technical Specifications," of Part 2, "Final Safety Analysis Report," and Part 4, "Technical Specifications," of its combined license (COL) application. The applicable regulations are Title 10 of the *Code of Federal Regulations* (10 CFR) 50.36, 10 CFR 50.36a, 10 CFR 52.79(a)(30), and Section IV.A.2 of the ABWR design certification rule (DCR), Appendix A to 10 CFR Part 52.

## 16.2 Summary of Application

The STP Units 3 and 4 COL application references the ABWR DCR. In accordance with the DCR, the PTS consist of the ABWR generic TS (GTS) and site-specific information. In addition, the PTS bases consist of the GTS bases and site-specific information.

Chapter 16 of the STP Units 3 and 4 FSAR incorporates by reference ABWR DCD Chapter 16, which contains the GTS and bases, with the exception of the proposed departures from the GTS and bases.

*Departures*

In the PTS and bases, the applicant proposes many departures from the GTS and bases. Approval of these departures requires the granting of exemptions from the GTS, as required by Section VIII.C.4 of the DCR. Part 7 of the COL application for STP Units 3 and 4; Table 5.0-1, "Tier 1, Tier 2*, and Tier 2 Departures and All Affected Sections"; and Table 5.0-2, "Tier 1 and Tier 2 Sections and Affected Departure Numbers"; list the departures in each PTS section. Part 7 evaluates these departures against the criteria for granting an exemption from the regulations in 10 CFR 52.7 and 10 CFR 50.12.

Section 2.0, "Departures Requiring Prior NRC Approval," of Part 7 of the COL application organizes the proposed departures, which require prior U.S. Nuclear Regulatory Commission (NRC) approval, into groups as indicated by the following subsection titles:

- COL application Part 7 Section 2.1, "Tier 1 and Tier 2* Departures from the DCD"

The following six Tier 1 departures required changes to the GTS and/or bases:

| STD DEP Number | Title | Affected GTS Sections | Evaluated In SER Sections |
|---|---|---|---|
| T1 2.3-1 | Deletion of Main Steam Isolation Valve (MSIV) Closure and Scram on High Radiation | 3.3.1.1, 3.3.6.1 | 16.4.6.1, 11.5.4 |

| STD DEP Number | Title | Affected GTS Sections | Evaluated In SER Sections |
|---|---|---|---|
| T1 2.4-2 | Feedwater Line Break Mitigation | 3.3.1.1, 3.3.1.4 | 16.4.6.1, 6 |
| T1 2.4-3 | Reactor Core Isolation Cooling (RCIC) Turbine/Pump | 3.3.1.4 | 16.4.6.1, 5.4.6, 6.3 |
| T1 2.12-2 | Instrumentation and Control (I&C) Power Divisions | 3.8.9 | 16.4.11.9, 8.1, 8.3 |
| T1 2.14-1 | Hydrogen Recombiner Requirements Elimination | 3.3.6.1, 3.3.6.2, 3.6.3.1, 3.6.3.2, 5.5.2.2 | 16.4.9.11, 7 |
| T1 3.4-1 | Safety-Related I&C Architecture | 1.1, 3.3.1.1, 3.3.1.2, 3.3.1.4, 3.3.3.1, 3.3.4.1, 3.3.5.1, 3.3.6.2, 3.8.4, 5.7.2 | 16.4.1.1, 16.4.6.1, 7 |

- COL application Part 7 Section 2.2.1, “Departures from the GTS – Changes to the GTS due to Tier 2 Design Departures”

The following nine Tier 2 departures require changes to the GTS and/or bases:

| STD DEP Number | Title | Affected GTS Sections | Evaluated In SER Sections |
|---|---|---|---|
| 6.2-2 | Containment Analysis | 3.6.1.1 (bases only)<br>3.6.1.2 (bases only)<br>3.6.1.4 (bases only) | 16.4.9.1, 16.4.9.2, 16.4.9.4, 6.2 |
| 7.3-12 | Leak Detection and Isolation System Sump Monitoring | 3.3.1.4, 3.4.3 | 16.4.6.1, 7 |
| 7.3-17 | Automatic Depressurization System (ADS) Electrical Interface | 3.3.1.4 (bases only)<br>3.8.9 | 16.4.6.4<br>16.4.11.9, 7 |
| 7.5-1 | Post-Accident Monitoring (Drywell Pressure) | 3.3.6.1, 3.3.6.2, 3.6.3.1, 3.6.3.2, 5.5.2.2 | 16.4.9.10, 16.4.9.11 |
| 7.7-10 | Control Rod Drive (CRD) Control System Interfaces | 1.1, 3.3.1.1, 3.3.1.2, 3.3.1.4, 3.3.3.1, 3.3.4.1, 3.3.5.1, 3.3.6.2, 3.8.4, 3.9.4, 5.7.2 | 16.4.6.1, 16.4.12.4, 7 |
| 7.7-18 | Rod Control and Information System Operator Information | 3.9.3, 3.10.3, 3.10.4, 3.10.5 | 16.4.12.3, 7 |
| 8.3-1 | Plant Medium Voltage Electrical System Design | 3.3.1.1, 3.3.1.4, 3.3.6.2, 3.5.1, 3.8.1, 3.8.2, 3.8.4, 3.8.7, 3.8.8, 3.8.9, 3.8.11 | 16.4.11.1, 8.1 |
| 8.3-3 | Electrical Site-Specific Power and Other Changes (STP specific) | 3.8.9 | 16.4.11.9, 8.3 |
| 10.4-5 | Condensate and Feedwater System | 3.3.4.2 (bases only) | 16.4.6.8, 10.4.7, 11.3.4 |
| *16.3-39 withdrawn* | *LCO 3.3.4.2, Feedwater and Main Turbine Trip Instrumentation* | *3.3.4.2* | *16.4.6.8* |

- COL application Part 7 Section 2.2.2, “Departures from the GTS – Changes of Intent to the GTS”

The following eight GTS departures address necessary changes to the intent of the GTS:

| STD DEP Number | Title | Affected GTS Sections | Evaluated In SER Sections |
|---|---|---|---|
| 16.2-1 | Safety Limit Violation | 2.2 | 16.4.2.2, 7 |
| *16.3-39 withdrawn* | *LCO 3.3.4.2, Feedwater and Main Turbine Trip Instrumentation* | *3.3.4.2* | *16.4.6.8* |
| 16.3-78 | LCO 3.3.6.1, Post Accident Monitoring (PAM) Instrumentation | 3.3.6.1 | 16.4.6.10 |
| 16.5-1 | Unit Responsibility | 5.1, 5.2 | 16.4.15.1 |
| 16.5-2 | Unit Staff | 5.2.2 | 16.4.15.2 |
| 16.5-3 | Technical Specification Bases Control Program | 5.4.2 | 16.4.15.4 |
| 16.5-4 | Reporting Requirements | 5.7.1.1 | 16.4.15.8 |
| 16.5-5 | TS 5.2.2, Unit Staff – Working Hours | 5.2.2 | 16.4.15.2 |
| 16.5-6 | TS 5.5.2.6 – Inservice Testing Program | 5.5.2.6 | 16.4.15.6.6 |

- COL application Part 7 Section 2.2.3, “Departures from the GTS – Editorial Revisions and Clarifications”

The following GTS departures address necessary editorial revisions and clarifications to the GTS and bases:

| STD DEP Number | Title | Affected GTS Sections | Evaluated In SER Sections |
|---|---|---|---|
| 16.2-2 | Safety Limit | 2.2 (bases only) | 16.4.2.2 |
| 16.3-1 | 3.0, Limiting Condition for Operation (LCO) Applicability | LCO 3.0.6 | 16.4.3.2 |
| 16.3-2 | LCO 3.0 and Surveillance Requirements (SRs) | SR 3.0.1 (bases only) | 16.4.3.3 |
| *16.3-3 withdrawn* | *LCO 3.1.7, Standby Liquid Control (SLC) System,* | *3.1.7 (bases only)* | *16.4.4.7* |
| 16.3-4 | LCO 3.1.1, Shutdown Margin (SDM) | 3.1.1 (bases only), 3.10.7 (bases only) | 16.4.4.1 |
| 16.3-5 | LCO 3.4.1, Reactor Internal Pumps (RIPs) – Operating | 3.4.1 | 16.4.7.1 |
| 16.3-6 | LCO 3.4.1, RIPs – Operating | 3.4.1 (bases only) | 16.4.7.1 |

| STD DEP Number | Title | Affected GTS Sections | Evaluated In SER Sections |
|---|---|---|---|
| 16.3-7 | LCO 3.4.2, Safety/Relief Valves (S/RVs) | 3.4.2 (bases only) | 16.4.7.2 |
| 16.3-8 | LCO 3.4.9 Reactor Coolant System (RCS) Pressure and Temperature (P/T) Limits | 3.4.9, 5.7.1.6 | 16.4.15.8 |
| 16.3-9 | LCO 3.4.7, Alternate Decay Heat Removal | 3.4.7, 3.4.8, 3.9.7 (bases only), 3.9.8 (bases only) | 16.4.7.7 |
| 16.3-10 | LCO 3.5.1, Emergency Core Cooling System (ECCS) - Operating | 3.5.1 (bases only) | 16.4.8.1 |
| 16.3-11 | LCO 3.4.3, RCS Operational LEAKAGE | 3.4.3 (bases only) | 16.4.7.3 |
| *16.3-12 Withdrawn* | *LCO 3.9.7, Residual Heat Removal (RHR) Flow Path* | *3.9.7 (bases only), 3.9.8 (bases only)* | *16.4.12.7* |
| 16.3-13 | LCO 3.9.8, RHR – "Low Water Level" Applicability | 3.9.8 (bases only) | 16.4.12.8 |
| 16.3-14 | LCO 3.9.2, Refuel Position Rod-Out Interlock | 3.9.2 (bases only) | 16.4.12.2 |
| 16.3-15 | LCO 3.9.5, Control Rod OPERABILITY – Refueling | 3.9.5 | 16.4.12.5 |
| 16.3-16 | LCO 3.7.1, Reactor Building Cooling Water (RCW) System, Reactor Service Water (RSW), and Ultimate Heat Sink (UHS) – Operating;<br>LCO 3.7.2, RCW, RSW, and UHS – Shutdown; and<br>LCO 3.7.3, RCW, RSW, and UHS – Refueling | 3.7.1, 3.7.2, 3.7.3 | 16.4.10.1 |
| 16.3-17 | LCO 3.10.12, Multiple CRD Subassembly Removal – Refueling | 3.10.12 | 16.4.13.12 |
| 16.3-18 | LCO 3.10.8, SHUTDOWN MARGIN (SDM) Test - Refueling | 3.10.8 | 16.4.13.8 |
| 16.3-19 | LCO 3.10.4, Control Rod Withdrawal – Cold Shutdown | 3.10.4 | 16.4.13.4 |
| 16.3-20 | LCO 3.10.4, Control Rod Withdrawal – Cold Shutdown | 3.10.4 (bases only) | 16.4.13.4 |
| 16.3-21 | LCO 3.10.5, CRD Removal – Refueling | 3.10.5 | 16.4.13.5 |
| *16.3-22* | *Not used* | | |

| STD DEP Number | Title | Affected GTS Sections | Evaluated In SER Sections |
|---|---|---|---|
| *withdrawn* | | | |
| 16.3-23 | LCO 3.10.5, CRD Removal - Refueling | 3.10.5 (bases only) | 16.4.13.5 |
| 16.3-24 | LCO 3.10.3, Control Rod Withdrawal – Hot Shutdown Bases | 3.10.3 (bases only) | 16.4.13.3 |
| 16.3-25 | LCO 3.9.1, Refuel Equipment Interlocks | 3.9.1 | 16.4.12.1 |
| 16.3-26 | LCO 3.10.2, Reactor Mode Switch Interlock Testing | 3.10.2 (bases only) | 16.4.13.2 |
| 16.3-27 | LCO 3.10.2, Reactor Mode Switch Interlock Testing | 3.10.2 (bases only) | 16.4.13.2 |
| 16.3-28 | LCO 3.10.1, In-Service Leak and Hydrostatic Testing Operation | 3.10.1 (bases only) | 16.4.13.1 |
| 16.3-29 | LCO 3.6.4.1, Secondary Containment | 3.6.4.1 | 12.4.9.13 |
| 16.3-30 | LCO 3.6.4.1, Secondary Containment | 3.6.4.1 (bases only) | 12.4.9.13 |
| 16.3-31 | LCO 3.6.4.3, Standby Gas Treatment (SGT) System | 3.6.4.3 (bases only) | 12.4.9.15 |
| 16.3-32 | LCO 3.6.2.1, Suppression Pool Average Temperature | 3.6.2.1 | 16.4.9.7 |
| 16.3-33 | LCO 3.6.2.1, Suppression Pool Average Temperature | 3.6.2.1 (bases only) | 16.4.9.7 |
| 16.3-34 | LCO 3.6.1.6, Wetwell-to-Drywell Vacuum Breakers | 3.6.1.6 | 16.4.9.6 |
| 16.3-35 | LCO 3.9.6, Reactor Pressure Vessel (RPV) Water Level | 3.9.6 (bases only) | 16.4.12.6 |
| 16.3-36 | LCO 3.6.2.3, RHR Suppression Pool Cooling | 3.6.2.3 (bases only) | 16.4.9.9 |
| 16.3-37 | LCO 3.6.2.3, RHR Suppression Pool Cooling | 3.6.2.3 (bases only) | 16.4.9.9 |
| *16.3-38* | *Not used* | | |
| *16.3-39 Withdrawn* | *LCO 3.3.4.2, Feedwater and Main Turbine Trip Instrumentation* | *3.3.4.2* | *16.4.6.8* |
| 16.3-40 | LCO 3.8.2, Alternating Current (AC) Source – Shutdown | 3.8.2 (bases only) | 16.4.11.2 |
| 16.3-41 | LCO 3.8.2, AC Sources – Shutdown | 3.8.2 | 16.4.11.2 |

| STD DEP Number | Title | Affected GTS Sections | Evaluated In SER Sections |
|---|---|---|---|
| 16.3-42 | LCO 3.8.4, DC Sources – Operating | 3.8.4 | 16.4.11.4 |
| 16.3-43 | LCO 3.6.1.1, Primary Containment | 3.6.1.1 (bases only) | 16.4.9.1 |
| *16.3-44 Withdrawn* | *LCO 3.6.1.1, Primary Containment* | *3.6.1.1 (bases only)* | *16.4.9.1* |
| 16.3-45 | LCO 3.6.1.1, Primary Containment | 3.6.1.1 (bases only) | 16.4.9.1 |
| 16.3-46 | LCO 3.7.2, RCW, RSW, and UHS Applicability | 3.7.2, 3.7.3 | 16.4.9.2, 16.4.9.3 |
| 16.3-47 | LCO 3.7.4, Control Room Habitability Area (CRHA) – Emergency Filtration (EF) System | 3.7.4 | 16.4.10.4 |
| 16.3-48 | LCO 3.7.4, CRHA – EF System | 3.7.4 (bases only) | 16.4.10.4 |
| 16.3-49 | LCO 3.8.1, AC Sources – Operating | 3.8.1 | 16.4.11.1 |
| 16.3-50 | LCO 3.3.1.4, ESF Actuation Instrumentation | 3.3.1.4 | 16.4.6.4 |
| 16.3-51 | LCO 3.8.3, Diesel Fuel Oil, Lube Oil, and Starting Air | 3.8.3 | 16.4.11.3 |
| 16.3-52 | LCO 3.8.8, Inverters – Shutdown | 3.8.8 (bases only) | 16.4.11.8 |
| *16.3-53* | *Not used* | | |
| *16.3-54* | *Not used* | | |
| 16.3-55 | LCO 3.3.4.1, Anticipated Transient Without Scram (ATWS) and End-of-Cycle Recirculation Pump Trip (EOC-RPT) Instrumentation | 3.3.4.1 (bases only) | 16.4.6.7 |
| *16.3-56* | *Not used* | | |
| 16.3-57 | LCO 3.3.1.2, Reactor Protection System (RPS) and MSIV Actuation | 3.3.1.2 (bases only) | 16.4.6.2 |
| 16.3-58 | LCO 3.8.6, Battery Cell Parameters | 3.8.6 | 16.4.11.6 |
| 16.3-59 | LCO 3.3.6.2, Remote Shutdown System | 3.3.6.2 | 16.4.6.11 |
| 16.3-60 | LCO 3.3.6.2, Remote Shutdown System | 3.3.6.2 | 16.4.6.11 |
| 16.3-61 | LCO 3.3.7.1, CRHA EF System Instrumentation | 3.3.7.1 | 16.4.6.12 |
| 16.3-62 | LCO 3.3.8.1, Electric Power Monitoring | 3.3.8.1 (bases only) | 16.4.6.13 |

| STD DEP Number | Title | Affected GTS Sections | Evaluated In SER Sections |
|---|---|---|---|
| 16.3-63 | LCO 3.3.8.2, Reactor Coolant Temperature Monitoring – Shutdown | 3.3.8.2 (bases only) | 16.4.6.14 |
| 16.3-64 | LCO 3.3.5.1, Control Rod Block Instrumentation | 3.3.5.1 | 16.4.6.9 |
| 16.3-65 | LCO 3.3.5.1, Control Rod Block Instrumentation | 3.3.5.1 | 16.4.6.9 |
| 16.3-66 | LCO 3.3.5.1, Control Rod Block Instrumentation | 3.3.5.1 (bases only) | 16.4.6.9 |
| 16.3-67 | LCO 3.3.5.1, Control Rod Block Instrumentation | 3.3.5.1 (bases only) | 16.4.6.9 |
| *16.3-68 Withdrawn* | *LCO 3.1.3, Control Rod OPERABILITY* | *3.1.3 (bases only)* | *16.4.4.3* |
| 16.3-69 | LCO 3.6.1.2, Primary Containment Air Locks | 3.6.1.2 | 16.4.9.2 |
| 16.3-70 | LCO 3.6.1.2, Primary Containment Air Locks | 3.6.1.2 (bases only) | 16.4.9.2 |
| *16.3-71 Withdrawn* | *LCO 3.6.1.3, Primary Containment Isolation Valves (PCIVs)* | *3.6.1.3* | *16.4.9.3* |
| *16.3-72 Withdrawn* | *LCO 3.6.1.3, PCIVs* | *3.6.1.3* | *16.4.9.3* |
| 16.3-73 | LCO 3.6.1.3, PCIVs | 3.6.1.3 (bases only) | 16.4.9.3 |
| 16.3-74 | LCO 3.6.1.3, PCIVs | 3.6.1.3 (bases only) | 16.4.9.3 |
| 16.3-75 | LCO 3.7.6, Main Condenser Offgas | 3.7.6 (bases only) | 16.4.10.6 |
| 16.3-76 | LCO 3.7.5, Control Room Habitability Area – Air Conditioning (CRHA-AC) System | 3.7.5 (bases only) | 16.4.10.5 |
| 16.3-77 | LCO 3.3.6.1 PAM Instrumentation | 3.3.6.1 (bases only) | 16.4.6.10 |
| 16.3-78 | LCO 3.3.6.1, PAM Instrumentation | 3.3.6.1 | 16.4.6.10 |
| *16.3-79* | *Not used* | | |
| 16.3-80 | LCO 3.8.1, AC Sourcing-Operating | 3.8.1 (bases only) | 16.4.11.1 |
| 16.3-81 | LCO 3.3.1.2, RPS and MSIV Actuation | 3.3.1.2 | 16.4.6.2 |
| 16.3-82 | LCO 3.3.1.2, RPS and MSIV Actuation | 3.3.1.2 (bases only) | 16.4.6.2 |
| 16.3-83 | LCO 3.3.1.3, SLC and Feedwater Runback (FWRB) Actuation | 3.3.1.3 | 16.4.6.3 |

| STD DEP Number | Title | Affected GTS Sections | Evaluated In SER Sections |
|---|---|---|---|
| 16.3-84 | LCO 3.3.1.1 SSLC Sensor Instrumentation | 3.3.1.1 | 16.4.6.1 |
| 16.3-85 | LCO 3.3.1.1 Safety System Logic Control (SSLC) Sensor Instrumentation | 3.3.1.1 (bases only) | 16.4.6.1 |
| 16.3-86 | LCO 3.3.1.4, ESF Actuation Instrumentation | 3.3.1.4 | 16.4.6.4 |
| 16.3-87 | LCO 3.3.1.4, ESF Actuation Instrumentation | 3.3.1.4 (bases only) | 16.4.6.4 |
| *16.3-88* | *Not used* | | |
| *16.3-89 Withdrawn* | *LCO 3.1.2, Reactivity Anomalies* | *3.1.2 (bases only)* | *16.4.4.2* |
| *16.3-90 Withdrawn* | *LCO 3.1.3, Control Rod OPERABILITY* | *3.1.3 (bases only)* | *16.4.4.3* |
| 16.3-91 | LCO 3.3.1.1, SSLC Sensor Instrumentation | 3.3.1.1 (bases only) | 16.4.6.1 |
| 16.3-92 | LCO 3.3.1.1, SSLC Sensor Instrumentation | 3.3.1.1 (bases only) | 16.4.6.1 |
| 16.3-93 | LCO 3.3.1.1, SSLC Sensor Instrumentation | 3.3.1.1 (bases only) | 16.4.6.1 |
| 16.3-94 | LCO 3.3.1.4, ESF Actuation Instrumentation | 3.3.1.4 | 16.4.6.4 |
| 16.3-95 | LCO 3.2.3, Linear Heat Generation Rate (LHGR) (Non-GE Fuel) | 3.2.3 | 16.4.5.3 |
| 16.3-96 | LCO 3.4.1, RIPs Operating | 3.4.1 | 16.4.7.1 |
| 16.3-97 | Technical Specifications Editorial Changes | various | 16.4 |
| 16.3-98 | SR 3.3.1.4, DIVISIONAL FUNCTIONAL TEST for Startup Range Neutron Monitors (SRNMs) | 3.3.1.1 (bases only) | 16.4.6.1 |
| 16.3-99 | Bases Allowable Value Misstatements | (bases only) 3.3.1.1, 3.3.1.4, 3.3.4.1, 3.3.4.2, 3.3.5.1, 3.3.7.1 | 16.4.6.1 |
| 16.3-100 | Setpoint Control Program Implementation | 1.1, 3.3.1.1, 3.3.1.4, 3.3.4.1, 3.3.4.2, 3.3.7.1, 3.3.8.1, 5.5.2.11 | 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, |

| STD DEP Number | Title | Affected GTS Sections | Evaluated In SER Sections |
|---|---|---|---|
| | | | 16.4.15.6.11 |
| 16.3-101 | Bases LCO 3.3.5.1, Required Actions A.1 and C.1 | 3.3.5.1 (bases only) | 16.4.6.9 |
| 16.3-102 | Bases SR 3.3.5.1.6 | 3.3.5.1 (bases only) | 16.4.6.9 |
| 16.3-103 | SR 3.8.1.15, Note 1 | 3.8.1 | 16.4.11.1 |
| 16.3-104 | SR 3.3.4.2.2 – CHANNEL FUNCTIONAL TEST – Feedwater Pump and Main Turbine Trip Instrumentation | 3.3.4.2 (bases only) | 16.4.6.8 |
| 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 Steam Line | 3.3.1.1 (bases only)<br>3.3.1.2 (bases only)<br>3.6.1.3 (bases only) | 16.4.6.1 |

As stated in FSAR Chapter 16, the applicant also provides site-specific information in Part 4 of the COL application to supplement the GTS and bases in order to complete the PTS and bases.

*COL License Information Item*

- COL License Information Item 16.1 COL Information Required for Plant Specific Technical Specifications

The GTS contain items regarding site-specific information that a COL applicant must provide with the PTS to complete a particular GTS provision (e.g., incorporation of an NRC-approved methodology into a plant's licensing basis). Detailed design information, equipment selection, instrumentation settings, or other information not available at the time of design certification (DC), are necessary to establish the values or information included in the PTS. The GTS and bases denote each preliminary or missing information item with brackets. Together, the COL application designates these bracketed or COL items as COL License Information[1] Item 16.1. Except for the completion of these COL items, and the requested departures, the PTS and bases are identical to the GTS and bases.

ABWR DCD Section 16.1.1 outlines the site-specific information that the COL applicant must provide to complete the PTS and bases and to resolve COL Information Item 16.1 as follows:

> In cases where the detailed design, equipment selection, or other efforts are required to establish the information to be specified in Technical Specifications, "[ ]" has been indicated. The COL applicant will evaluate their applicability and provide the required information to complete its plant specific TS.
>
> As part of the Technical Specification Improvement Program undertaken by the NRC and the industry, portions of Section 5.0, "Administrative Controls," of

[1] Hereafter, the COL License Information Item 16.1 is referred to as COL Information Item 16.1.

> NUREGs 1433 and 1434, could be relocated to licensee-controlled document. This improvement has been incorporated into the ABWR Technical Specifications. The COL applicant will have to ensure that the portions of Section 5.0 relocated to licensee-controlled documents are controlled in accordance with an administrative control system acceptable to the NRC.

Chapter 16 of the NRC Final Safety Evaluation Report (FSER) for the ABWR DCR, Appendix A to 10 CFR Part 52, also describes this site-specific information as follows:

> In the [draft final safety evaluation report (DFSER)], the staff stated that the COL applicant should include plant- and site-specific information in the ABWR TS. This was DFSER COL Action Item 16-1. [ABWR standard safety analysis report (SSAR) or DCD] Chapter 16, "Technical Specifications," contains guidelines enabling the COL applicant to complete the plant- and site-specific portions of the TS on the basis of as-procured hardware and software. This is acceptable.
>
> As part of the TS Improvement Program the staff concluded that portions of [standard TS (STS) (NUREGs 1433 and 1434)] Section 5.0, "Administrative Controls," could be relocated to licensee-controlled documents. This improvement was incorporated into the ABWR TS.
>
> COL applicants will have to ensure that the portions of Section 5.0 relocated to licensee-controlled documents are controlled in accordance with an administrative control system acceptable to the staff.

The applicant proposes to address COL Information Item 16.1 by providing supplemental site-specific information. In Part 4 of the COL application for STP Units 3 and 4, the applicant replaces bracketed information in the GTS and bases with the appropriate site-specific information.

The applicant does not describe in the COL application the administrative control system the applicant plans to use to govern the relocated administrative control provisions that are to be maintained in licensee-controlled documents. As noted above, these provisions were removed from GTS Section 5.0 as part of the ABWR design certification, consistent with the development of the STS.

*Proposed COL Items*

Table 16.1 lists the GTS requirements and associated bases that contain placeholders for preliminary or missing information associated with COL Information Item 16.1. The COL applicant must finalize these items to complete the PTS and bases. This table also lists the applicant's disposition of each COL item for completing the PTS and bases. The disposition of each item considers the following:

- The applicant's chosen resolution method (RM) for the item (Option 1, 2, or 3).
- The status of the item—pending, resolved, or unresolved:
  - The status of an item is marked "pending" if the applicant has not provided, in docketed correspondence, information for finalizing the item.

- The status of an item is marked “resolved” if the applicant has provided, in docketed correspondence, information that is acceptable to the staff for finalizing the item and consistent with the chosen RM.

- The status of the item is marked “unresolved” if the staff has requested additional information regarding the site-specific information provided by the applicant, and is waiting to receive or has not completed reviewing the applicant’s response, or the response is unacceptable.

- Whether (yes or no) the staff has verified that the applicant has updated the PTS and bases to reflect the staff-accepted resolution of the item.

By letters dated May 21, 2009, and August 18, 2009, the applicant provided the RM for each COL item listed in Table 16.1. These letters addressed the staff’s **request for additional information (RAI) 16-1** and **RAI 16-21**, respectively. In these RAIs, the staff asked the applicant to revise the proposed resolution of COL items in accordance with interim staff guidance (ISG) DC/COL-ISG-08, “Necessary Content of Plant-Specific Technical Specifications When a Combined License Is Issued.” This ISG lists three acceptable RMs for resolving the COL items (i.e., site-specific information identified in the GTS and bases) and for finalizing the PTS and bases. For each COL item, the applicant must provide the following:

- A site-specific value or site-specific information (Option 1);

- A useable value or useable information that is bounding to the site-specific value or information (Option 2); or

- A staff-approved administrative control TS for the use of an NRC-approved methodology to determine the site-specific value or information and establish a document for recording the site-specific value or information outside the PTS (Option 3).

The staff closed **RAI 16-1** for tracking purposes because it was superseded by supplemental **RAI 16-21**, which the staff also closed for tracking purposes because it was superseded by supplemental **RAI 16-65**, which was tracked as an open item in the SER with open items because the staff had not completed the review of the site-specific information provided by the applicant. Table 16.1 had denoted such COL items as unresolved in the SER with open items. The GTS contains bracketed optional provisions that provide operational flexibility, but adopting that flexibility in the PTS requires a site-specific justification in accordance with the reviewer’s notes in the GTS and bases. In most cases, the applicant has not adopted this flexibility in the PTS for STP Units 3 and 4. The Table 16.1 disposition column lists Option 1 as the RM for such items because finalizing bracketed information, where the brackets provide for operational flexibility, is equivalent to providing site-specific information. For all COL items listed in the table, the staff must verify that the applicant has properly updated the PTS and bases in accordance with the stated RM. The table disposition column indicates whether there is a completed and verified PTS update for each COL item, as of Revision 4 of the COL application.

**Table 16.1 Site-Specific Information to Resolve COL Information Item 16.1**

| COL Item | GTS Reference | Information Needing Finalization (See description in applicant's response to RAI 16-21) | Disposition | | |
|---|---|---|---|---|---|
| | | | RM | Status | Verified |
| 1 | B 2.1.2 | Edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section III | 1 | Resolved | Yes |
| 2 | B 3.0 | Reactor steam dome pressure for performing control rod scram time testing | 1 | Resolved | Yes |
| 3 | 3.1.3 | Limit on control rod scram time from fully withdrawn to 60% rod insertion position | 1 | Resolved | Yes |
| 4 | 3.1.4 | Maximum number of slow OPERABLE control rods | 1 | Resolved | Yes |
| 5 | 3.1.4 | Scram time criterion for an inoperable control rod | 1 | Resolved | Yes |
| 6 | 3.1.4 | 6 scram time values at 10%, 40%, and 60% rod insertion for 6.55 MPaG and 7.24 MPaG reactor steam dome pressure | 1 | Resolved | Yes |
| 7 | 3.1.7 | Temperature limit values for SLC pump operation; remove reviewer's note | 1 | Resolved | Yes |
| 8 | B 3.2.3 | Reference to non-GE fuel analysis document | 1 | Resolved | Yes |
| 9 | B 3.3.1.1 | Minimum number of local power range monitor (LPRM) inputs for each average power range monitor (APRM) division | 2 | Resolved | Yes |
| 10 | 3.3.1.1 | Applicability conditions for SSLC Sensor Instrumentation in percentage of rated thermal power (RTP) | 1 | Resolved | Yes |
| 11 | 3.3.1.1 | Applicability condition for SSLC Sensor Instrumentation in percentage of RTP | 1 | Resolved | Yes |
| 12 | 3.3.1.1 | Oscillation Power Range Monitor Allowable Values in terms of neutron flux oscillation limits | 1 | Resolved | Yes |
| 13 | 3.3.1.1 | Surveillance Requirement (SR) 3.3.1.1.2 Frequency | 1 | Resolved | Yes |
| 14 | 3.3.1.1 | SR 3.3.1.1.3 Frequency | 1 | Resolved | Yes |
| 15 | 3.3.1.1 | SR 3.3.1.1.4 Frequency | 1 | Resolved | Yes |

| COL Item | GTS Reference | Information Needing Finalization (See description in applicant's response to RAI 16-21) | Disposition | | |
|---|---|---|---|---|---|
| | | | RM | Status | Verified |
| 16 | 3.3.1.1 | SR 3.3.1.1.5 Frequency | 1 | Resolved | Yes |
| 17 | 3.3.1.1 | SR 3.3.1.1.5 Frequency (Functions 15.a and 15.b) | 1 | Resolved | Yes |
| 18 | 3.3.1.1 | SR 3.3.1.1.6 Frequency | 1 | Resolved | Yes |
| 19 | 3.3.1.1 | SR 3.3.1.1.8 Frequency | 1 | Resolved | Yes |
| 20 | 3.3.1.1 | SR 3.3.1.1.10 SSLC Sensor Instrumentation--Allowable Values | 3 | Resolved | Yes |
| 21 | 3.3.1.1 | SR 3.3.1.1.10 SSLC Sensor Instrumentation Allowable Values (Functions 15.a and 15.b) | 1 | Resolved | Yes |
| 22 | 3.3.1.1 | SR 3.3.1.1.11 SSLC Sensor Instrumentation--Allowable Values | 3 | Resolved | Yes |
| 23 | B 3.3.1.1 | Thermal power time constant for APRM-Simulated Thermal power – High, Flow Biased, SSLC Sensor Function | 1 | Resolved | Yes |
| 24 | B 3.3.1.1 | SSLC Sensor Instrumentation Function Applicability | 1 | Resolved | Yes |
| 25 | B 3.3.1.1 | Minimum main steam line leak rate in main steam tunnel to reach the temperature instrumentation setting allowable value | 1 | Resolved | Yes |
| 26 | 3.3.1.2 | SR 3.3.1.2.1 Frequency | 1 | Resolved | Yes |
| 27 | 3.3.1.2 | SR 3.3.1.2.2 Frequency | 1 | Resolved | Yes |
| 28 | 3.3.1.2 | SR 3.3.1.2.3 Frequency | 1 | Resolved | Yes |
| 29 | 3.3.1.3 | SR 3.3.1.3.1 Frequency | 1 | Resolved | Yes |
| 30 | 3.3.1.4 | SR 3.3.1.4.3 Frequency | 1 | Resolved | Yes |
| 31 | 3.3.1.4 | SR 3.3.1.4.6, Engineered Safety Features (ESF) Actuation, Sensor Instrumentation--Allowable Values | 3 | Resolved | Yes |
| 32 | B 3.3.2.1 | Bases for Required Action E.1 Completion Time | 1 | Resolved | Yes |
| 33 | B 3.3.2.1 | Bases for SR 3.3.2.1.1 Frequency | 1 | Resolved | Yes |

| COL Item | GTS Reference | Information Needing Finalization (See description in applicant's response to RAI 16-21) | Disposition | | |
|---|---|---|---|---|---|
| | | | RM | Status | Verified |
| 34 | 3.3.2.1 | SR 3.3.2.1.4 Frequency | 1 | Resolved | Yes |
| 35 | 3.3.2.1 | SR 3.3.2.1.5 Frequency | 1 | Resolved | Yes |
| 36 | 3.3.3.1 | Completion Time for Required Action B.1 | 1 | Resolved | Yes |
| 37 | 3.3.3.1 | SR 3.3.3.1.1 Frequency | 1 | Resolved | Yes |
| 38 | 3.3.4.1 | Completion Time for Required Action E.1 | 1 | Resolved | Yes |
| 39 | 3.3.4.1 | Completion Times for Required Actions F.1 and F.2 | 1 | Resolved | Yes |
| 40 | 3.3.4.1 | Completion Time for Required Action G.1 | 1 | Resolved | Yes |
| 41 | 3.3.4.1 | SR 3.3.4.1.2 Frequency | 1 | Resolved | Yes |
| 42 | 3.3.4.1 | ATWS and EOC-RPT, Sensor Instrumentation Allowable Values (Functions 1, 2, and 3) | 3 | Resolved | Yes |
| 42 | 3.3.4.1 | ATWS and EOC-RPT, Sensor Instrumentation Allowable Value (Function 7, ASD pump trip timers) | 1 | Resolved | Yes |
| 43 | B 3.3.4.1 | Bases for Frequency of SR 3.3.4.1.7, channel functional test | 1 | Resolved | Yes |
| 44 | 3.3.4.2 | SR 3.3.4.2.2, channel functional test Frequency | 1 | Resolved | Yes |
| 45 | 3.3.4.2 | Feedwater Pump and Main Turbine Trip Sensor Instrumentation Allowable Value | 3 | Resolved | Yes |
| 46 | 3.3.4.2 | Type of component actuation | 1 | Resolved | Yes |
| 47 | 3.3.5.1 | Completion Time for Required Action A.1 | 1 | Resolved | Yes |
| 48 | 3.3.5.1 | Completion Time for Required Action C.1 | 1 | Resolved | Yes |
| 49 | 3.3.5.1 | Applicability of automated thermal limit monitor (ATLM) control rod block function | 1 | Resolved | Yes |
| 50 | 3.3.5.1 | SR 3.3.5.1.1 Frequency | 1 | Resolved | Yes |
| 51 | 3.3.5.1 | SR 3.3.5.1.2 Frequency | 1 | Resolved | Yes |

| COL Item | GTS Reference | Information Needing Finalization (See description in applicant's response to RAI 16-21) | Disposition | | |
|---|---|---|---|---|---|
| | | | RM | Status | Verified |
| 52 | B 3.3.5.1 | Range for allowable values for low power setpoint (LPSP) control rod block instrumentation functions, ATLM and rod worth minimizer (RWM) | 1 | Resolved | Yes |
| 53 | 3.3.5.1 | Applicability of RWM control rod block function | 1 | Resolved | Yes |
| 54 | 3.3.5.1 | SR 3.3.5.1.6 Frequency | 1 | Resolved | Yes |
| 55 | B 3.3.6.1 | Design description of primary containment isolation valve position post accident monitoring instrumentation | 1 | Resolved | Yes |
| 56 | 3.3.6.1 | SR 3.3.6.1.1 Frequency | 1 | Resolved | Yes |
| 57 | 3.3.6.1 | Applicability of Startup Range Neutron Monitor - Neutron Flux post-accident monitoring (PAM) function | 1 | Resolved | Yes |
| 58 | 3.3.6.1 | Applicability of Average Power Range Monitor - Neutron Flux PAM function | 1 | Resolved | Yes |
| 59 | B 3.3.6.2 | Bases for Completion Time for Required Action A.1 | 1 | Resolved | Yes |
| 60 | 3.3.6.2 | SR 3.3.6.2.1 Frequency | 1 | Resolved | Yes |
| 61 | 3.3.7.1 | CHRA EF System Instrumentation--Allowable Values | 3 | Resolved | Yes |
| 62 | 3.3.7.1 | SR 3.3.7.1.1 Frequency | 1 | Resolved | No |
| 63 | 3.3.7.1 | SR 3.3.7.1.2 Frequency | 1 | Resolved | Yes |
| 64 | 3.3.8.1 | Electrical Power Monitoring Instrumentation--Allowable Values | 3 | Resolved | Yes |
| 65 | 3.3.8.1 | SR 3.3.8.1.1 Frequency | 1 | Resolved | Yes |
| 66 | 3.3.8.1 | SR 3.3.8.1.2 Frequency | 1 | Resolved | Yes |
| 67 | 3.3.8.2 | SR 3.3.8.2.1 Frequency | 1 | Resolved | Yes |
| 68 | 3.3.8.2 | SR 3.3.8.2.2 Frequency | 1 | Resolved | Yes |
| 69 | 3.4.1 | Minimum number of RIPs required to be in operation | 1 | Resolved | Yes |

| COL Item | GTS Reference | Information Needing Finalization (See description in applicant's response to RAI 16-21) | Disposition | | |
|---|---|---|---|---|---|
| | | | RM | Status | Verified |
| 70 | B 3.4.1 | Plant-specific analysis for alternative number of RIPs operating | 1 | Resolved | Yes |
| 71 | B 3.4.2 | Surveillance performance condition on minimum steam dome pressure for opening of the S/RV when manually actuated | 1 | Resolved | Yes |
| 72 | B 3.4.3 | Value of unidentified LEAKAGE flow rate limit | 1 | Resolved | Yes |
| 73 | B 3.4.3 | COL Application for Leak-Before-Break Qualification for Piping Systems | 1 | Resolved | Yes |
| 74 | 3.4.9 | Temperature criterion for performing surveillance | 1 | Resolved | Yes |
| 75 | 3.4.9 | Temperature criterion for performing surveillance | 1 | Resolved | Yes |
| 76 | B 3.5.1.9 | Surveillance test condition for each ADS valve | 1 | Resolved | Yes |
| 77 | 3.5.2 | Minimum water volume and tank level in condensate storage tank for the high-pressure core flooder (HPCF) subsystem | 1 | Resolved | Yes |
| 78 | B 3.6.1.1 | Maximum allowable leakage rate for the primary containment at reduced pressure | 1 | Resolved | Yes |
| 79 | B 3.6.1.1 | Reference to bracketed surveillance requirement | 1 | Resolved | Yes |
| 80 | 3.6.1.2 | Air lock door seal gap pressure criterion for air lock leak test surveillance | 1 | Resolved | Yes |
| 81 | 3.6.1.3 | Required Action completion time | 1 | Resolved | Yes |
| 82 | 3.6.1.3 | Bracketed surveillance requirement - leak rate testing for primary containment purge valve with resilient seals | 1 | Resolved | Yes |
| 83 | 3.6.1.3 | Bracketed surveillance requirement to verify percent open restriction on each 550 mm primary containment purge valve and its value | 1 | Resolved | Yes |

| COL Item | GTS Reference | Information Needing Finalization (See description in applicant's response to RAI 16-21) | Disposition | | |
|---|---|---|---|---|---|
| | | | RM | Status | Verified |
| 84 | B 3.6.1.3 | Disposition of Reviewer's Note in bases for surveillance requirement to verify percent open restriction on each 550 mm primary containment purge valve | 1 | Resolved | Yes |
| 85 | B 3.6.1.3 | Bases for surveillance note regarding applicability of surveillance | 1 | Resolved | Yes |
| 86 | 3.6.3.1 | Surveillance acceptance criteria for hydrogen recombiners | 1 | Resolved | Yes |
| 87 | B 3.6.4.3 | Revision number of bases reference | 1 | Resolved | Yes |
| 88 | 3.7.1 | UHS design detail | 1 | Resolved | Yes |
| 89 | B 3.7.1 | UHS design detail | 1 | Resolved | Yes |
| 90 | 3.7.1 | UHS design detail | 1 | Resolved | Yes |
| 91 | 3.7.1 | Minimum water level of UHS [spray pond] | 1 | Resolved | Yes |
| 92 | 3.7.1 | Minimum water level of RSW pump well of the intake structure | 1 | Resolved | Yes |
| 93 | 3.7.1 | Maximum RSW water temperature at the inlet to the RCW/RSW heat exchangers | 1 | Resolved | Yes |
| 94 | 3.7.1 | UHS design detail | 1 | Resolved | Yes |
| 95 | 3.7.2 | UHS design detail | 1 | Resolved | Yes |
| 96 | 3.7.2 | Minimum water level of UHS [spray pond] | 1 | Resolved | Yes |
| 97 | 3.7.2 | Minimum water level of RSW pump well of the intake structure | 1 | Resolved | Yes |
| 98 | 3.7.2 | Maximum RSW water temperature at the inlet to the RCW/RSW heat exchangers | 1 | Resolved | Yes |
| 99 | 3.7.3 | UHS design detail | 1 | Resolved | Yes |
| 100 | 3.7.3 | Minimum water level of UHS [spray pond] | 1 | Resolved | Yes |
| 101 | 3.7.3 | Minimum water level of RSW pump well of the intake structure | 1 | Resolved | Yes |
| 102 | 3.7.3 | Maximum RSW water temperature at the inlet to the RCW/RSW heat exchangers | 1 | Resolved | Yes |

| COL Item | GTS Reference | Information Needing Finalization (See description in applicant's response to RAI 16-21) | Disposition | | |
|---|---|---|---|---|---|
| | | | RM | Status | Verified |
| 103 | B 3.7.7 | Unit specific documentation containing response time limits for main turbine bypass system | 1 | Resolved | Yes |
| 104 | 3.8.1 | Acceptance criteria for diesel generator testing – frequency | 1 | Resolved | Yes |
| 105 | 3.8.1 | Acceptance criteria for diesel generator testing – voltage | 1 | Resolved | Yes |
| 106 | 3.8.1 | Acceptance criteria for diesel generator testing – power | 1 | Resolved | Yes |
| 107 | 3.8.1 | Minimum fuel oil volume in each day tank | 1 | Resolved | Yes |
| 108 | 3.8.1 | Unit power supply - design detail | 1 | Resolved | Yes |
| 109 | 3.8.1 | Test conditions for loads to be rejected; acceptance criteria for diesel generator load rejection test - maximum frequency following load rejection, and frequency and voltage 3 seconds after load rejection | 1 | Resolved | Yes |
| 110 | 3.8.1 | Acceptance criterion for diesel generator testing - maximum voltage during and following load rejection | 1 | Resolved | Yes |
| 111 | 3.8.1 | Acceptance criteria for diesel generator testing - load profile for 24-hour run | 1 | Resolved | Yes |
| 112 | 3.8.1 | Reference to regulatory position in Regulatory Guide (RG) 1.9, Revision 3 | 1 | Resolved | Yes |
| 113 | B 3.8.1 | Performance criteria for a functional combustion turbine generator (CTG), steady-state voltage and frequency | 1 | Resolved | Yes |
| 114 | B 3.8.1 | Bases for voltage and frequency tolerances for diesel generators | 1 | Resolved | Yes |
| 115 | 3.8.1 | Surveillance note regarding MODE restrictions for performing diesel generator (DG) load rejection surveillance, and disposition of associated reviewer's note in bases | 1 | Resolved | Yes |

| COL Item | GTS Reference | Information Needing Finalization (See description in applicant's response to RAI 16-21) | Disposition | | |
|---|---|---|---|---|---|
| | | | RM | Status | Verified |
| 116 | B 3.8.1 | Surveillance note regarding MODE restrictions for performing DG automatic trip bypass on loss of voltage with an ECCS initiation signal surveillance; load sequence timer surveillance; and associated reviewer's notes in bases | 1 | Resolved | Yes |
| 117 | 3.8.3 | Limits on fuel oil storage tank level, lube oil inventory, and starting air receiver pressure | 1 | Resolved | Yes |
| 118 | B 3.8.3 | ASTM standards for new fuel oil | 1 | Resolved | Yes |
| 119 | 3.8.4 | Battery surveillance acceptance criteria for minimum battery terminal voltage on float charge and maximum connection resistance for inter-cell, inter-rack, and inter-tier connections, and for terminal connections | 1 | Resolved | Yes |
| 120 | 3.8.4 | Battery charger surveillance acceptance criterion for current | 1 | Resolved | Yes |
| 121 | 3.8.6 | Battery cell parameter verification surveillance conditional frequencies based on discharge and overcharge voltage limits | 1 | Resolved | Yes |
| 122 | 3.8.6 | Battery cell parameter limits on specific gravity, and limitations on use of maximum charging current in lieu of specific gravity | 1 | Resolved | Yes |
| 123 | B 3.8.11 | Performance criteria for a functional CTG, steady-state voltage and frequency | 1 | Resolved | Yes |
| 124 | 3.9.5 | Minimum pressure in control rod scram accumulator | 1 | Resolved | Yes |
| 125 | B 3.10.9 | Number of RIPs in operation | 1 | Resolved | Yes |
| 126 | 4.1.1 | Description of or figure depicting site and exclusion area boundaries | 1 | Resolved | Yes |
| 127 | 4.1.2 | Description of or figure depicting low-population zone (LPZ) | 1 | Resolved | Yes |

| COL Item | GTS Reference | Information Needing Finalization (See description in applicant's response to RAI 16-21) | Disposition | | |
|---|---|---|---|---|---|
| | | | RM | Status | Verified |
| 128 | 4.3.1.2 | Nominal center to center distance between fuel assemblies placed in storage racks | 1 | Resolved | Yes |
| 129 | 5.1.1 | Title of position responsible for overall unit operation | 1 | Resolved | Yes |
| 130 | 5.1.2 | Title of position responsible for control room command function, and title of person signing the notice of who has the control room command function | 1 | Resolved | Yes |
| 131 | 5.2.1 | Reference to document where onsite and offsite organizational requirements are documented | 1 | Resolved | Yes |
| 132 | 5.2.1 | Title of position responsible for overall safe operation of the plant | 1 | Resolved | Yes |
| 133 | 5.2.1 | Title of corporate executive position with corporate responsibility for overall plant nuclear safety | 1 | Resolved | Yes |
| 134 | 5.2.2 | Unit staff titles | 1 | Resolved | Yes |
| 135 | 5.2.2 | Control room staffing requirements | 1 | Resolved | Yes |
| 136 | 5.2.2 | Administrative requirements limiting working hours of unit staff performing safety related functions | 1 | Resolved | Yes |
| 137 | 5.2.2 | Title of position requiring the person to hold an active senior reactor operator (SRO) license | 1 | Resolved | Yes |
| 138 | 5.2.2 | Title of position that the shift technical advisor shall provide advisory technical support | 1 | Resolved | Yes |
| 139 | 5.3.1 | Unit staff qualification standard | 1 | Resolved | Yes |
| 140 | 5.5.1.1 | Generic Letter reference | 1 | Resolved | Yes |
| 141 | 5.5.2.1 | Title of position that approves licensee-initiated changes to the Offsite Dose Calculation Manual (ODCM) | 1 | Resolved | Yes |

| COL Item | GTS Reference | Information Needing Finalization (See description in applicant's response to RAI 16-21) | Disposition | | |
|---|---|---|---|---|---|
| | | | RM | Status | Verified |
| 142 | 5.5.2.7 | Document providing basis for Ventilation Filter Test Program (VFTP) ESF filter ventilation system test frequencies | 1 | Resolved | Yes |
| 143 | 5.5.2.7 | VFTP inplace test criteria for ESF ventilation system HEPA filters | 1 | Resolved | Yes |
| 144 | 5.5.2.7 | VFTP inplace test criteria for ESF ventilation system charcoal adsorbers | 1 | Resolved | Yes |
| 145 | 5.5.2.7 | VFTP laboratory test criteria for ESF ventilation system charcoal adsorber sample | 1 | Resolved | Yes |
| 146 | 5.5.2.7 | Disposition of Reviewer's Note regarding allowable penetration | 1 | Resolved | Yes |
| 147 | 5.5.2.7 | VFTP criteria for maximum pressure drop across combined HEPA filters, the prefilters, and the charcoal adsorbers | 1 | Resolved | Yes |
| 148 | 5.5.2.7 | VFTP criteria for energy dissipation by ESF ventilation system heaters | 1 | Resolved | Yes |
| 149 | 5.7.1.1 | Note for multiple-unit site on Annual Report format; when to submit initial report | 1 | Resolved | Yes |
| 150 | 5.7.1.2 | Note for multiple unit site on Annual Radiological Environmental Operating Report format; other report bracketed details regarding format, and thermoluminescent dosimeter (TLD) location and exposure period | 1 | Resolved | Yes |
| 151 | 5.7.1.3 | Note for multiple unit site on annual Radiological Effluent Release Report format | 1 | Resolved | Yes |
| 152 | 5.7.1.5 | Individual specifications that address core operating limits | 1 | Resolved | Yes |
| 153 | 5.7.1.5 | Identify the Topical Report(s) by number, title, date, and NRC staff approval document, or identify the staff Safety Evaluation Report for a plant-specific core operating limits methodology by NRC letter and date | 1 | Resolved | Yes |

| COL Item | GTS Reference | Information Needing Finalization (See description in applicant's response to RAI 16-21) | Disposition | | |
|---|---|---|---|---|---|
| | | | RM | Status | Verified |
| 154 | 5.7.1.6 | Individual specifications that address the reactor vessel pressure and temperature limits and the heatup and cooldown rates | 1 | Resolved | Yes |
| 155 | 5.7.1.6 | Topical Report(s), number, title, date, and NRC staff approval document or staff safety evaluation report for a plant-specific pressure temperature limits methodology by NRC letter and date | 1 | Resolved | Yes |
| 156 | 5.7.2 | Bracketed statement regarding Special Reports | 1 | Resolved | Yes |

## 16.3 Regulatory Basis

The regulatory basis of the information incorporated by reference is addressed in the Final Safety Evaluation Report (FSER) related to the ABWR DCD, NUREG–1503. In addition, the relevant requirements of Commission regulations for TS and associated acceptance criteria are in Section 16 of NUREG–0800.

In accordance with Section VIII, "Processes for Changes and Departures," of "Appendix A to Part 52--Design Certification Rule for the U.S. Advanced Boiling Water Reactor," 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, Section VIII.A.4 and Section VIII.B.6, respectively. The COL application for STP Units 3 and 4 proposes no Tier 2* departures affecting the GTS and bases. Tier 2 departures affecting the GTS and bases 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 affecting the GTS and bases do not require prior NRC approval and 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.

The applicable regulatory requirements for TS are as follows:

- 10 CFR 50.36 and 50.36a
- 10 CFR 52.79(a)(30)

Section 182a of the Atomic Energy Act requires applicants for nuclear power plant operating licenses to state the following:

> Such technical specifications, including information of the amount, kind, and source of special nuclear material required, the place of the use, the specific characteristics of the facility, and such other information as the Commission may, by rule or regulation, deem necessary in order to enable it to find that the utilization…of special nuclear material will be in accord with the common defense

and security and will provide adequate protection to the health and safety of the public. Such technical specifications shall be a part of any license issued.

In 10 CFR 50.36, the Commission established the regulatory requirements related to the TS content. In doing so, the Commission emphasized matters related to the prevention of accidents and the mitigation of the consequences from accidents. As recorded in the Statements of Consideration, "Technical Specifications for Facility Licenses; Safety Analysis Reports," (33 FR 18610, December 17, 1968), the Commission noted that applicants were expected to incorporate into their TS "those items that are directly related to maintaining the integrity of the physical barriers designed to contain radioactivity." 10 CFR 50.36(c) requires the TS for utilization facilities to contain (1) safety limits and limiting safety system settings, (2) limiting conditions for operation, (3) surveillance requirements, (4) design features, and (5) administrative controls.

10 CFR 50.36(c)(2)(ii) requires the TS to include an LCO for each item meeting one or more of the following four criteria:

- Criterion 1 – Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.

- Criterion 2 – A process variable, design feature, or operating restriction that is an initial condition of a design-basis accident (DBA) or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

- Criterion 3 – A structure, system, or component (SSC) that is part of the primary success path and which functions or actuates to mitigate a DBA or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

- Criterion 4 – An SSC which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

*Regulatory Guidance*

In 1992, the NRC issued STS to clarify the content and format of requirements necessary to ensure the safe operation of nuclear power plants. These STS were developed from the results of the TS improvement program in accordance with 10 CFR 50.36 and SECY-93-067, "Final Policy Statement on TS Improvements for Nuclear Power Reactors," published on July 22, 1993. Major revisions to the STS were published in 1995 (Revision 1), 2001 (Revision 2), and 2004 (Revision 3).

The STS for boiling-water reactors (BWRs) are in two NRC documents. For each document, Volume 1 contains the TS and Volume 2 contains the associated TS bases. The STS include bases for safety limits, limiting safety system settings, limiting conditions for operation, and associated action and surveillance requirements. The documents are:

- NUREG–1433, "Standard Technical Specifications General Electric Plants, BWR/4"
- NUREG–1434, "Standard Technical Specifications General Electric Plants, BWR/6"

The STS reflect the results of a detailed review of the application of Interim Policy Statement criteria to generic system functions. The NRC published these results in a "Split Report," and

issued the report to the nuclear steam supply system vendor-owner groups in May 1988. STS also reflect the results of extensive discussions concerning various drafts of STS to ensure that the application of the TS criteria will consistently reflect detailed system configurations and operating characteristics for all reactor designs. Therefore, the STS bases provide an abundance of information regarding the extent to which the STS present requirements that are necessary to protect public health and safety.

In the Final Policy Statement, the Commission expressed the view that satisfying the guidance in the policy statement also satisfies Section 182a of the Atomic Energy Act and 10 CFR 50.36. The Final Policy Statement describes the safety benefits of the STS. It also encourages licensees to use the STS as the basis for license amendments that either partially or completely convert existing TS requirements to improved TS based on the STS.

The format and content of the PTS and bases in a COL application referencing a certified design should be based on the GTS and bases for the certified design. PTS and bases may include appropriate plant-specific departures from the referenced certified GTS and bases when warranted.

## 16.4 Technical Evaluation

The staff reviewed the PTS and bases that are in Part 4 of the COL application for STP Units 3 and 4. FSAR Chapter 16, which is in Part 2 of the COL application, incorporates by reference ABWR DCD Chapter 16, "Technical Specifications." This DCD chapter contains placeholders in the GTS and bases for providing site-specific information to resolve the COL items, which are denoted by brackets and listed in Section 16.2, Table 16.1 of this SER. FSAR Chapter 16 also contains markups of GTS and bases pages affected by departures from the ABWR DCD. Part 4 of the COL application combines the GTS and bases, the departures from the GTS and bases, and the site-specific COL information to produce the PTS and bases. The site-specific information was inserted into the GTS and bases, as modified by the departures, to form a complete set of PTS and bases for staff review and approval. Part 7 of the COL application describes and justifies the proposed departures from the ABWR DCD, including affected pages in the GTS and bases.

The staff's review confirmed that the PTS and bases, as presented in Part 4 of the COL application, incorporated the GTS and bases with the departures for which the applicant has requested exemptions from the ABWR DCR. The staff also reviewed the site-specific information in the PTS and bases, which the applicant provided in accordance with COL Information Item 16.1 and which Table 16.1 of this SER describes. The staff focused the review on the completion of the COL items listed in Table 16.1 and the technical justifications for the departures from the GTS and bases.

*ABWR Design Certification Rule*

Chapter 16 of the ABWR DC FSER documents the NRC staff's review of the GTS and bases. The staff's DC review of the GTS and bases applies to the PTS and bases except for the noted departures and associated exemptions. The staff did not review information that the COL application incorporates by reference in the PTS and bases because it is identical to information in the GTS and bases.

*Resolution of COL Items Listed in Table 16.1*

The applicant proposed to resolve each COL item using one of the three options permitted by DC/COL-ISG-08: Option 1, a site-specific value or site-specific information; Option 2, a useable value or useable information that is bounding to the site-specific value or information; or Option 3, a staff-approved administrative control TS requiring the use of an NRC-approved methodology to determine the site-specific value or information and the establishment of a document for recording the site-specific value or information.

Option 1 – The staff determines whether the site-specific information provided under Option 1 is acceptable by verifying that the information is accurate and useable for unit operation by comparing the information with the FSAR in the COL application. The Table 16.1 COL items resolved using Option 1 fall within the following groups:

- Limiting condition for operation parameter values
- Applicability conditions
- Required action completion times
- Surveillance requirement frequencies
- Surveillance requirement acceptance criteria
- Administrative controls provisions related to multiple-unit sites
- Administrative control provisions for radioactive waste storage
- Site location and exclusion area description in design features
- References to requirements documents outside the TS

Option 2 – The staff determines whether the site-specific information under Option 2 is acceptable by verifying that the information is bounding and useable for unit operation by comparing the information with the FSAR and reviewing the justification included in the COL application, including how the bounding value was determined. The applicant proposes to complete only one Table 16.1 COL item by providing site-specific bounding information; this is Table 16.1 COL Item 9 regarding the minimum number of Local Power Range Monitors (LPRMs) needed for an operable Average Power Range Monitor (APRM) division.

Option 3 – The staff determines whether the site-specific information under Option 3 is acceptable by verifying that the PTS administrative program for controlling the relocated information (1) conforms to the GTS if the GTS contains such a program, or evaluating the proposed administrative controls program for conformance to applicable regulatory requirements; (2) determines and specifies site-specific information to be maintained outside of the PTS using an NRC-approved methodology; (3) specifies the establishment of a document to record the most recent version of the relocated information; (4) specifies controlling changes to the specified document in accordance with 10 CFR 50.59 and the specified NRC-approved methodology; and (5) specifies the schedule for providing the NRC with updates to the specified document.

The staff also verifies that the PTS include appropriate references to the proposed PTS administrative program, as needed to establish a connection between the relocated information and the associated individual PTS requirements.

The applicant proposes using Option 3 to resolve the Table 16.1 COL items providing instrumentation allowable values by (1) removing all instrumentation settings from the PTS, and (2) specifying a Setpoint Control Program (SCP) that satisfies the above stated acceptance criteria for a PTS administrative program under Option 3. These Table 16.1 COL items are Item Numbers 20, 22, 31, 42, 45, 61, and 64. See Chapter 7 of this SER for the staff's evaluation of the instrumentation setpoint methodology.

The staff requested additional information about Table 16.1 COL items as described in the following discussion of **RAIs 16-1**, **16-21**, and **16-65**. This SER also evaluates the proposed resolution of each Table 16.1 COL item in the evaluation of the associated PTS section.

**RAI 16-1**. The staff prepared a listing of all site-specific information (as described in Table 16.1 of this report) that COL Information Item 16.1 requires. The staff also requested that the applicant state how it plans to complete this information based on the guidance in DC/COL-ISG-8. In a letter of response to this RAI dated May 21, 2009 (ML091460117), the applicant proposes to resolve most of the items using "Option 1": one item using "Option 2"; and several items using "Option 3." In addition, the applicant states it will provide the information in Revision 3 of the STP Units 3 and 4 COL application with a few exceptions, such as references to the NRC-approved instrumentation setpoint methodology; the methodologies for calculating RCS pressure and temperature limits; and the containment allowable leakage rate values. The staff clarified the request for information for resolving Table 16.1 COL items in supplemental **RAI 16-21**. This action resolved **RAI 16-1**.

The applicant revised its response to **RAI 16-1** regarding Table 16.1 COL Item 9 in a letter dated January 20, 2010 (ML100220493). The applicant proposes to complete this item by specifying "51" as the minimum number of LPRM inputs for each APRM division. This value replaces the bracketed value of "[20]" in the bases for GTS 3.3.1.1 Function 2a, "APRM Neutron Flux – High, Setdown." An APRM division at operating BWR units remains operable typically with at least a third of the associated LPRMs inoperable. Because the design of STP Units 3 and 4 provides 52 LPRMs for each APRM division, the staff concludes that "51" is a bounding value. The applicant proposes this number because it does not expect to complete an analysis to determine the less-conservative but actual limiting number in time to meet the COL application review schedule. The applicant's response stated that this bounding value is useable for plant operation because it will ensure safe operation of the unit while allowing for one LPRM failure in each APRM division without being required to declare the associated APRM division inoperable. The staff believes this conservative allowance will not unduly restrict unit operation while the actual limiting number of LPRMs is determined by analysis. The staff finds that the applicant's completion of Table 16.1 COL Item 9 satisfies the conditions for using "Option 2" of DC/COL-ISG-8. The staff verified that Revision 4 of the COL application specifies the value of 51 as the minimum number of LPRM inputs for each APRM division. Therefore, the bases for GTS 3.3.1.1 Function 2a are acceptable and Table 16.1 COL Item 9 is resolved. .

**RAI 16-21** The staff clarified the request for COL items in a supplement to **RAI 16-1**. This supplement included a model specification for an instrumentation SCP. The applicant's response to **RAI 16-21** dated August 18, 2009 (ML092320101), addresses all 24 issues included in the RAI, as follows. The staff found the responses acceptable for the reasons stated, with noted exceptions.

1. The applicant proposed an SCP specification to address completion of Table 16.1 COL items related to instrumentation setting allowable values. Although based on the specification developed as a part of the ESBWR design-certification-application review,

the STPNOC proposal contained differences that were unacceptable to the staff. Supplemental **RAI 16-65** addresses these differences and the proposed setpoint methodology. The discussion of the applicant's response to this RAI describes the resolution of this issue regarding implementation of DC/COL-ISG-8, "Option 3," for limiting safety system settings.

2. As requested by the staff, the applicant states that it uses "Option 1" to resolve Table 16.1 COL items involving bracketed surveillance requirement frequencies by removing the brackets. The applicant also states that "Option 1" is the RM regardless of whether the PTS changes the value in the brackets, provided the value is justified and is not a bounding value.

3. The applicant previously listed the following Table 16.1 COL items as having no RM: Item Nos. 8, 13, 14, 15, 19, 26, 32, 33, 34, 35, 36, 38, 39, 40, 43, 55, 56, 59, 60, 66, 67, 69, 70, 79, 81, 82, 85, 86, 87, 88, 89, 90, 94, 95, 99, 103, 108, 112, 115, 116, 118, 125, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 146, 149, 150, 151, 152, 153, 154, 155, and 156. As requested by the staff, the applicant changed the RM for these Table 16.1 COL items to "Option 1."

4. As requested by the staff, the applicant changed the bracketed 92-day Frequencies for DIVISIONAL FUNCTIONAL TEST (DFT) and CHANNEL FUNCTIONAL TEST (CFT) surveillance requirements to 31 days to complete Table 16.1 COL Items 16, 18, 27, 28, 29, 30, 37, 41, 44, 50, 51, 63, 65, and 68. In addition, as requested by the staff, the applicant designated these Table 16.1 COL items as resolved using "Option 1." The staff considers the 31-day Frequency acceptable based on the reliability of the instrumentation components. The GTS bases for the various instrumentation functions may contain other justifications for DFT and CFT frequencies. Because these justifications are part of the GTS bases, the staff considers them acceptable, with one exception as discussed below. The staff verified that Revision 4 of the COL application specifies a 31-day Frequency for the DFT and CFT surveillance requirements associated with these Table 16.1 COL items.

   In reviewing the proposed completion of Table 16.1 COL Item 44, the staff noted that the bases for GTS SR 3.3.4.2.2 state that the [92]-day CFT Frequency is based on "the system capability to automatically perform self-tests and diagnostics." In **RAI 16-68** the staff stated that in general, ABWR GTS and PTS SR Frequencies should be based on more than "the system capability to automatically perform self-tests and diagnostics." The staff requested the applicant to identify all instances in Revision 3 of the PTS bases, for which this is the sole rationale for the acceptability of an SR Frequency, and to propose additional justifications consistent with the STS (NUREG–1433 and NUREG–1434) and/or other appropriate justifications in the GTS bases. The staff also asked that the applicant address changes proposed in response to this question in a new standard departure from the GTS bases. In the response to **RAI 16-68** dated January 13, 2010 (ML100141738), the applicant (1) revised the bases for GTS SR 3.3.4.2.2 with an appropriate justification for the frequency consistent with the design and the STS; (2) stated that the GTS bases include no other instances that justify an SR frequency with the noted rationale for the acceptability of an SR Frequency; and (3) proposed a new standard departure as requested by the staff (STD DEP 16.3-104). The staff verified that Revision 4 of the COL application includes these changes. Therefore, **RAI 16-68** is resolved.
   Subsection 16.4.6.8 of this SER addresses the new departure and the associated change proposed for incorporation in the bases for PTS SR 3.3.4.2.2.

5. Although the GTS requirements containing Table 16.1 COL Items 17 and 21 are omitted from the PTS and bases by STD DEP T1 2.3-1 (regarding removal of SSLC Functions 15a and 15b from GTS Table 3.3.1.1-1), the RM for these items is not "n/a." The applicant's response changes the RM to "Option 1," as requested by the staff.

6. The applicant removed the brackets from the 7-second thermal power time constant for GTS 3.3.1.1 Function 2.b, "APRM Simulated Thermal Power-High, Flow Biased," in GTS Table 3.3.1.1-1, to complete Table 16.1 COL Item 23. The applicant changed the RM for this item to "Option 1," instead of "Option 3." This is acceptable because "7 seconds" is the correct site-specific value.

7. The applicant corrected a typographical error in the table listing the disposition of the COL items in the **RAI 16-1** response for Table 16.1 COL Item 42, by changing "ADS" to "ASD."

8. In the table listing the disposition of the COL items in the **RAI 16-1** response for Table 16.1 COL Item 46, the applicant rationalized replacing "[valve]" with "trip" in GTS SR 3.3.4.2.4, "Perform LOGIC SYSTEM FUNCTIONAL TEST, including [valve] actuation," by stating that "STD DEP 16.3-39 will be revised to address testing of the actuated device." The staff's issue was that replacing "valve" with "trip" is more than providing site-specific information, and should be addressed in a departure. The applicant also listed the RM as not applicable ("n/a"). In **RAI 16-21**, the staff requested the applicant to change the resolution method to "Option 1" because of the proposed change to STD DEP 16.3-39. However, in response to **RAI 16-21**, the applicant reverted to the GTS phrasing for PTS SR 3.3.4.2.4 and removed the brackets from "[valve]," which completes Table 16.1 COL Item 46 using "Option 1." Note that STD DEP 16.3-39 was not changed in Revision 3 of the COL application to address SR 3.3.4.2.4 or to address testing of the actuated device. This is appropriate because the GTS term "valve" is retained. Subsection 16.4.6.8 of this SER contains the evaluation of STD DEP 16.3-39. As described in Subsection 16.4.6.8, the applicant's response to **RAI 16-39** withdraws STD DEP 16.3-39 and incorporates by reference GTS 3.3.4.2 and bases into PTS 3.3.4.2 and bases, with one departure affecting the bases, STD DEP 10.4-5. This departure affects the bases of GTS 3.3.4.2 by increasing the number of feedwater pumps per unit from two to four in the design of STP Units 3 and 4. The staff notes that in Revision 4 of the COL application the use of the term "CHANNEL CHECK" in the bases to PTS SR 3.3.4.2.1 is an error; it should be "SENSOR CHANNEL CHECK." Verification that this error is corrected in a future revision of the COL application is being tracked as **Confirmatory Item 16-21.8**.

9. In the table listing the disposition of the COL items in the **RAI 16-21** response, the applicant changed the RM for Table 16.1 COL Items 47 and 48 (removing the brackets from "[72] hours") from "n/a" to "Option 1." In addition, the applicant proposed to revise the bases of GTS 3.3.5.1 for the 72-hour Completion Time for Required Action A.1, to restore one Automated Thermal Limit Monitor (ATLM) channel to Operable status, and the 72-hour Completion Time for Required Action C.1, to restore one Rod Worth Minimizer (RWM) channel to Operable status. The proposed PTS bases for these 72-hour Completion Times, with changes indicated by underlining, state:

> The 72 hour Completion Time for Action A.1 is based on the <u>low probability of an event occurring coincident with a failure of the remaining OPERABLE channel, the</u> high reliability of the ATLM Function, and provides sufficient time to effect repairs.

> The 72 hour Completion Time is based on the low probability of an event occurring coincident with a failure of the remaining OPERABLE channel, the high reliability of the RWM Function, and provides sufficient time to effect repairs.

These changes are acceptable because they provide a justification for the 72-hour completion times consistent with the STS. The staff verified that Revision 4 of the COL application incorporates these bases changes. However, these bases changes must also be addressed in a departure from the GTS bases. Following the discussion of **RAI 16-21**, this subsection of the SER evaluates the applicant's response to supplemental **RAI 16-65 Issue 5**, and discusses the resolution of this issue related to Table 16.1 COL Items 47 and 48.

10. In the table listing the disposition of the COL items in the **RAI 16-21** response, the applicant changes the RM for Table 16.1 COL Items 49, 52, and 53 from "Option 2" to "Option 1." The applicant also removes the brackets from the applicability conditions and the low-power setpoint for the ATLM and RWM control rod block functions in GTS 3.3.5.1 and bases. (Specifically, the applicant removes brackets from: SR 3.3.5.1.1 Note; Table 3.3.5.1-1 Applicability of Functions 1a and 1b; Table 3.3.5.1-1 Footnotes a and b; SR 3.3.5.1.4; bases for SR 3.3.5.1.1, SR 3.3.5.1.3, and SR 3.3.5.1.4; SR 3.3.5.1.3 and SR 3.3.5.1.4 low-power setpoint for ATLM and RWM and associated bases.) The applicant provided site-specific values for the applicability conditions and low-power setpoint for the ATLM and RWM control rod block functions with the following justification:

> The NRC Safety Evaluation by the Office of Nuclear Reactor Regulation Relating to Amendment 17 General Electric Topical Report NEDE-24011-P, "General Electric Standard Application for Reactor Fuel" contained in NEDO–24011–A–14–US concludes that "the need for the RSCS (and the RWM above 10 percent power) is no longer apparent." Thus, 10% has been determined to be an acceptable value for the RWM control rod block functions for (a) the Allowable Value for the low power setpoint (LPSP), and for (b) the Applicability.
>
> With thermal power below 30% RTP, the minimum critical power ratio (MCPR) is sufficiently high to prevent falling below the Safety Limit MCPR (SLMCPR), even in the event of the most severe control rod withdrawal event (RWE). Therefore, the ATLM function is not required below 30% RTP. Thus, 30% has been determined to be an acceptable value for the ATLM control rod block functions for (a) the Allowable Value for the low power setpoint (LPSP), and for (b) the Applicability.

Based on the NRC staff's safety evaluation of NEDO–24011–A–14–US, "General Electric Standard Application for Reactor Fuel," which applies to STP Units 3 and 4, the 10 percent RTP value for the RWM function and the 30 percent RTP value for the ATLM function are acceptable. The staff verified that these values are incorporated into Revision 3 of the COL application. Therefore, this issue and Table 16.1 COL Items 49, 52, and 53 are resolved.

11. The applicant provides justification in the bases of PTS 3.3.5.1 for the bracketed 24-hour Frequency of GTS SR 3.3.5.1.6, "Perform CHANNEL CHECK of process parameter and

setpoint inputs to the ATLM." The applicant proposes to revise the last paragraph of the bases for GTS SR 3.3.5.1.6 as follows, with new information underlined.

> The Frequency is based upon operating experience that demonstrates channel failure is rare and on the online-diagnostics that monitor the channels for proper operation. The specified high reliability of each channel provides confidence that a channel failure will be rare. The CHANNEL CHECKs every 24 hours supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

The applicant's response states that the 24-hour frequency is consistent with the 24-hour Frequency of GTS SR 3.2.1.1 to verify that the average planar linear heat generation rate (APLHGR) is within limits, and GTS SR 3.2.2.1, to verify that the MCPR is within limits. The APLHGR and MCPR, which are calculated by the core monitoring system (CMS), are inputs to the calculation of the ATLM control rod block function. The ATLM channel check is performed by comparing the process parameter input values reported from CMS and the values reported from the plant computer functions (PCF) to verify consistency of the input signals used for calculation of the MCPR and APLHGR in the CMS. The staff verified that Revision 4 of the COL application incorporates the above change in the bases for PTS SR 3.3.5.1.6. Therefore, the 24-hour Frequency and the associated change to the bases are acceptable. Removing the brackets from "[24] hours" and the proposed bases change resolve this issue and Table 16.1 COL Item 54. The staff verified that the justification for the bases change has been addressed in Revision 4 of the COL application in STD DEP 16.3-102. Following the discussion of **RAI 16-21**, this section of the SER evaluates the applicant's response to supplemental **RAI 16-65 Issue 6**, and discusses the resolution of this issue related to Table 16.1 COL Item 54.

12. In the table listing the disposition of the COL items in the **RAI 16-21** response, the applicant changes the RM for Table 16.1 COL Item 62 from "n/a" to "Option 1." The applicant's response also revises the bracketed frequency of GTS SR 3.3.7.1.1 from "24 hours" to "12 hours," and removes the brackets. This SR requires performing a channel check for CRHA EF system instrumentation Function 1, "Control Room Ventilation Radiation Monitors." The proposed site-specific frequency of "12 hours" is acceptable because it is consistent with the STS. These changes to SR 3.3.7.1.1 and bases resolve this issue and Table 16.1 COL Item 62. The staff verified that SR 3.3.7.1.1 of Revision 4 of the COL application incorporates the frequency change from 24 hours to 12 hours. However, the bases for SR 3.3.7.1.1 still list 24 hours for the CHANNEL CHECK frequency. Verification that a future revision of the COL application incorporates this change is being tracked as **Confirmatory Item 16-21.12**.

13. In the table listing the disposition of the COL items in the **RAI 16-21** response, the applicant changes the RM for Table 16.1 COL Item 64 from "Option 2" to "Option 3." Specifically, the applicant revises GTS SR 3.3.8.1.2 to state, "Perform CHANNEL CALIBRATION on each required CHANNEL consistent with Specification 5.5.2.11, "Setpoint Control Program (SCP)." These changes satisfy the conditions for using "Option 3" to complete LSSS-related COL items, as stated above in this section of the SER. They are therefore acceptable. The staff verified that Revision 4 of the COL application incorporates the change to PTS SR 3.3.8.1.2.

However, the COL application must also address these changes in a departure from the GTS. The staff issued supplemental **RAI 16-65 Issue 1** with a request that the applicant provide a standard departure regarding the implementation of "Option 3" to complete PTS requirements for instrumentation LSSS.

In addition, the setpoint methodology document (Topical Report WCAP-17119-P, "Methodology for South Texas Project Units 3 and 4 ABWR Technical Specification Setpoints Advanced Boiling Water Reactor South Texas Project Units 3 and 4," Revision 0, dated October 2009), which PTS 5.5.2.11 specifies for determining instrumentation settings, does not specifically address the instrumentation functions required by GTS 3.3.8.1, although it addresses all other applicable PTS-required instrumentation functions. To complete the review of WCAP-17119-P, the staff issued supplemental **RAI 16-65 Issue 2** with a request that the applicant revise WCAP-17119-P to address the instrumentation functions required by GTS 3.3.8.1.

The issuance of supplemental **RAI 16-65 Issues 1 and 2** resolves **RAI 16-21 Issue 13**. Following the discussion of **RAI 16-21**, this section of the SER addresses the applicant's response to supplemental **RAI 16-65 Issues 1 and 2**.

14. In the table listing the disposition of the COL items in the **RAI 16-21** response, the applicant changes the RM for Table 16.1 COL Items 74 and 75 from "Option 3" to "Option 1." Specifically, the applicant states that the bracketed RCS temperature values presented in GTS SR 3.4.9.4 and SR 3.4.9.5 are acceptable for vessel and head flange surveillance entry conditions. The staff verified the removal of the brackets in Revision 3 of the COL application. Resolution of Table 16.1 COL Items 74 and 75 by completing these SRs was pending the acceptance of the RCS Pressure and Temperature Limits Report (PTLR), which was tracked in the SER with open items as part of **Open Item 16-1**. Based on the staff's finding that the pressure-temperature limits methodology is acceptable, as described in the resolution of **RAI 5.3.2-1** in Section 5.3.2 of this report, **RAI 16-21 Issue 14**, and Table 16.1 COL Items 74 and 75 are resolved.

15. In the table listing the disposition of the COL items in the **RAI 16-21** response, the applicant changes the RM for Table 16.1 COL Item 80 from "n/a" to "Option 1." The applicant also removes the brackets from the door seal gap test pressure site-specific value of 0.0689 MPaG in PTS SR 3.6.1.2.1 and the bracketed phrase in the associated bases. The applicant also proposes to replace the GTS bases sentence, "The acceptance criteria were established [during initial air lock and primary containment OPERABILITY testing]" with the site-specific sentence, "The acceptance criteria were established based on the type of door seal used and will be verified during initial air lock and primary containment OPERABILITY testing." This proposed change to the bases is acceptable because it states the correct basis for the acceptance criteria. The staff verified that the proposed site-specific sentence is incorporated into the bases of PTS 3.6.1.2.1 in Revision 4 of the COL application. These changes resolve this issue and Table 16.1 COL Item 80.

16. In the table listing the disposition of the COL items in the **RAI 16-1** response, the applicant lists Option 2 as the RM for Table 16.1 COL Item 83 regarding GTS bracketed SR 3.6.1.3.14, "[Verify each 550 mm primary containment purge valve is blocked to restrict the valve from opening > [50]%.]." The applicant proposes to remove the brackets and use the 50% value because this value is bounding. In **RAI 16-21 Issue 16**, the staff requested the applicant to justify that the 50% value is bounding and useable. The

applicant's response to **RAI 16-21 Issue 16** states that the 550 mm primary containment purge valves are not blocked and GTS SR 3.6.1.3.14 will therefore be omitted from PTS 3.6.1.3. The applicant also changes the RM for Table 16.1 COL Item 83 to Option 1. The staff verified that the FSAR Chapter 15 analysis supports not having to block the containment purge valves. The staff verified that Revision 4 of the COL application omits GTS SR 3.6.1.3.14 and bases. Therefore, this issue is resolved.

17. In the table listing the disposition of the COL items in the **RAI 16-21** response and in response to **RAI 16-21 Issues 3** and **17**, the applicant changes the RM for Table 16.1 COL Items 84 and 85 from "n/a" to "Option 1" because of the omission of the bases, including the reviewer's note, for GTS SR 3.6.1.3.14 from the bases for PTS 3.6.1.3. Based on the acceptance of the omission of GTS SR 3.6.1.3.14 from PTS 3.6.1.3, as discussed above for **Issue 16 of RAI 16-21**, this site-specific disposition is acceptable. Therefore, this issue is resolved.

18. In the table listing the disposition of the COL items in the **RAI 16-1** response, the applicant states that for Table 16.1 COL Item 103, the site-specific location for response time limits for main turbine bypass system instrumentation functions is the "Instrument Setpoint Summary Report." This was intended to complete the bases for GTS SR 3.7.7.3, which states, "The response time limits are specified in [unit specific documentation]." The applicant's response to **RAI 16-21** changes the location to the "Technical Requirements Manual (TRM)," and clarifies that the TRM is not the document that the SCP specification requires. In addition, the applicant states that response time limits are not governed by the SCP. In supplemental **RAI 16-65, Issue 7**, the staff requested that the applicant describe the TRM in the FSAR. See the discussion of the applicant's response to **RAI 16-65 Issue 7** below for the resolution of this request and **RAI 16-21 Issue 18**.

19. In the table listing the disposition of the COL items in the **RAI 16-1** response, the applicant proposes using "Option 2" to resolve the following Table 16.1 Items regarding diesel generator (DG) and combustion turbine generator (CTG) surveillance acceptance criteria:

    - Table 16.1 Item 104 – GTS 3.8.1 DG frequency
    - Table 16.1 Item 105 – GTS 3.8.1 DG voltage
    - Table 16.1 Item 106 – GTS 3.8.1 DG power
    - Table 16.1 Item 109 – GTS 3.8.1 DG frequency following load rejection
    - Table 16.1 Item 110 – GTS 3.8.1 DG voltage following load rejection
    - Table 16.1 Item 111 – GTS 3.8.1 DG power – 24-hour load profile
    - Table 16.1 Item 113 – GTS 3.8.1 Actions bases, CTG voltage and frequency
    - Table 16.1 Item 114 – GTS 3.8.1 SR bases for DG voltage and frequency tolerances
    - Table 16.1 Item 123 – GTS 3.8.11 Actions bases, CTG voltage and frequency

    In **RAI 16-21** the staff requested the applicant to explain why it considers the recommendations of RG 1.9 to be bounding values for DG and CTG testing acceptance criteria for frequency, power factor, voltage, and power or change the RM to "Option 1." In its response, the applicant changes the RM to "Option 1" and removes the brackets from the GTS acceptance criteria values for frequency, power factor, voltage, and power for DG and CTG testing. The applicant states that the GTS bracketed values, as modified by STD DEP 8.3-1 for the CTG, are the correct site-specific values for STP Units 3 and 4. The staff verified that the applicant incorporated these changes in Revision 3 of the COL application, thus resolving this issue and the listed Table 16.1 COL items.

20. In the table listing the disposition of the COL items in the **RAI 16-21** response, the applicant changes the RM for Table 16.1 COL Items 115 and 116 from "n/a" to "Option 1." The applicant proposes to remove the bracket from Notes 1 and 2 of GTS SR 3.8.1.9 and to remove the reviewer's notes from the bases for Note 1 of GTS SR 3.8.1.9, SR 3.8.1.10, SR 3.8.1.13, and SR 3.8.1.18. SR Note 1 prohibits the performance of the associated SRs while the unit is in Modes 1, 2, or 3. The reviewer's notes explain how to relax this restriction. This issue is considered resolved. The bracket was removed from PTS SR 3.8.1.9 Notes 1 and 2 in Revision 3 of the COL application. The staff verified that the bases for PTS SR 3.8.1.9, SR 3.8.1.10, SR 3.8.1.13, and SR 3.8.1.18 in Revision 4 of the COL application omit the reviewer's notes.

21. In the table listing the disposition of the COL items in the **RAI 16-21** response, the applicant changes the resolution method for Table 16.1 COL Items 119, 120, 121, and 122 from "Option 2" to "Option 1." In addition, the applicant replaces GTS bracketed values with the following correct site-specific values (indicated by underlined text):

    Item 119 PTS SR 3.8.4.1, Verify battery terminal voltage is ≥ <u>130</u> V on float charge. This value is acceptable because it is consistent with the minimum float voltage requirements of all three major domestic suppliers of safety related batteries.

    PTS SR 3.8.4.2, Verify no visible corrosion on terminals and connectors OR Verify connection resistance is ≤ <u>20% above the resistance as measured during installation of the battery</u> for inter-cell, inter-rack, inter-tier, and terminal connections. This value is acceptable because it is consistent with the values and limits described in Institute of Electrical and Electronic Engineers (IEEE) Standard (Std) 450, and used by all three major domestic suppliers of safety related batteries. The staff noted that the GTS bases in Revision 4 of the COL application are missing the title for the bases discussion of SR 3.8.4.2 (before second paragraph of the "Surveillance Requirements" section of the bases for Specification 3.8.4). Verification that this omission is corrected and included in STD DEP 16.3-97 in a future revision of the COL application is being tracked as part of **Confirmatory Item 16-3**.

    PTS SR 3.8.4.5, Verify connection resistance is ≤ <u>20% above the resistance as measured during installation of the battery</u> for inter-cell, inter-rack, inter-tier, and terminal connections. This value is acceptable because it is consistent with the values and limits described in IEEE Std 450, and used by all three major domestic suppliers of safety related batteries.

    Item 120 PTS SR 3.8.4.6, Verify each required battery charger supplies ≥ <u>600</u> amps at ≥ 125 V for ≥ 12 hours. This value is acceptable because the design of STP Units 3 and 4 uses 600 amp battery chargers.

    Item 121 PTS SR 3.8.6.2, Verify battery cell parameters meet Table 3.8.6-1 Category B limits. Second Frequency is: "Once within 24 hours after battery discharge < <u>110</u> V." This value is acceptable

because it is consistent with the type of battery to be selected. Third Frequency is: Once within 24 hours after battery overcharge > 140 V. This value is acceptable because it is consistent with the specified battery voltage range of 105 V to 140 V.

Item 122 PTS Table 3.8.6-1, "Battery Cell Parameter Requirements"

CATEGORY A: LIMITS FOR EACH DESIGNATED PILOT CELL, Specific Gravity ≥ 1.195;

CATEGORY B: LIMITS FOR EACH CONNECTED CELL, Specific Gravity ≥ 1.190 AND Average of all connected cells > 1.200;

CATEGORY C: LIMITS FOR EACH CONNECTED CELL, Specific Gravity – Not more than 0.020 below average of all connected cells AND Average of all connected cells > 1.190.

Footnote (c) on Specific Gravity: Or battery charging current is < 2 amps when on float charge. This is acceptable only during a maximum of 7 days following a battery recharge.

The PTS specific gravity values are acceptable because they are consistent with those used by all three major domestic suppliers of safety related batteries.

For the reasons stated above, the proposed site-specific information for completing these Table 16.1 COL items is acceptable and this issue is resolved. The staff verified that the specific gravity and related float charge current values proposed in the response to **RAI 16-21 Issue 21** for Table 16.1 COL Item 122 were incorporated into Revision 3 of the COL application. The staff verified that Revision 4 of the COL application contains the proposed values to complete Table 16.1 COL Items 119, 120, and 121.

22. In the table listing the disposition of the COL items in the **RAI 16-21** response, the applicant changes the RM for Table 16.1 COL Item 146 from "n/a" to "Option 1" and removes the reviewer's note associated with GTS 5.5.2.7.c, which states:

> [Reviewer's Note: Allowable penetration = [100% methyl iodide efficiency for charcoal credited in staff safety evaluation] / (safety factor).
>
> Safety factor = [5] for systems with heaters.]

The applicant's response states this is appropriate because "the ventilation filter laboratory testing is in accordance with RG 1.52, Revision 2, Section 6, 'Laboratory Testing Criteria for Activated Carbon.' The note is unnecessary to meet the criteria of the Regulatory Guide." The staff concludes that the application of the reviewer's note is covered by conformance to Revision 2 of RG 1.52, Section 6, and this issue is therefore resolved.

23. In the table listing the disposition of the COL items in the **RAI 16-21** response, the applicant changes the RM from "n/a" to Option 1 for Table 16.1 COL Item 149, regarding the bracketed placeholder for other unit unique annual reports in GTS 5.7.1.1.b. The applicant omits the placeholder from PTS 5.7.1.1 because there are no other annual

reports to list, and this issue is therefore resolved. The staff verified that Revision 4 of the COL application omits the bracketed placeholder from PTS 5.7.1.1.

24. In the table listing the disposition of the COL items in the **RAI 16-21** response, the applicant changes the resolution method from "n/a" to Option 1 for Table 16.1 COL Item 156 regarding the bracketed paragraph at the beginning of GTS 5.7.2, "Special Reports." The applicant omits this paragraph from PTS 5.7.2 because the information is essentially a reviewer's note and contains no requirements. This issue is therefore resolved. The staff verified that Revision 4 of the COL application omits the bracketed paragraph from PTS 5.7.2.

The staff clarified the request for COL items in **RAI 16-65** as a supplement to **RAI 16-21**. This action resolved **RAI 16-21**, except for **Issue 14**, which was tracked in the SER with open items as part of **Open Item 16-1**.

**RAI 16-65**. This RAI supplements **RAI 16-21** and raises the following 9 issues identified in reviewing the applicant's responses to the 24 issues raised in **RAI 16-21**. The applicant's response letters dated January 13, 2010 (ML100141738), and November 1, 2010 (ML103070427), addresses the 9 issues as follows. The discussion of each issue includes the staff's evaluation of the applicant's response. With noted exceptions, the applicant's response is acceptable for the reasons stated.

1. The staff requested that the applicant provide a standard departure from the GTS and bases for changes associated with Specification 5.5.2.11 and instrumentation surveillance requirements that include verifying instrumentation trip or actuation settings, and that the applicant proposed in response to **RAI 16-21 Issue 1**. This includes the following SER Table 16.1 COL Items for sensor channel calibration trip setpoint allowable values, and the associated GTS surveillance requirements:

   Item 20 – SR 3.3.1.1.10
   Item 22 – SR 3.3.1.1.11
   Item 31 – SR 3.3.1.4.6
   Item 42 – SR 3.3.4.1.3
   Item 45 – SR 3.3.4.2.3
   Item 61 – SR 3.3.7.1.3
   Item 64 – SR 3.3.8.1.2

   The applicant proposes STD DEP 16.3-100 in response to **RAI 16-65 Issue 1**. The departure:

   - revises the definitions of Channel Functional Test and Division Functional Test to include setpoint verification;
   - removes the "allowable value" columns from GTS Tables 3.3.1.1-1, 3.3.1.4-1, 3.3.4.1-1, and 3.3.7.1-1;
   - removes Footnote (c) from GTS Table 3.3.1.1-1, which is associated with the allowable value for Function 2f, OPRM;
   - removes the allowable value from GTS SR 3.3.4.2.3 and SR 3.3.8.1.2;

- restates Sensor Channel Calibration and Channel Calibration requirements in SR 3.3.1.1.10, SR 3.3.1.1.11, SR 3.3.1.4.6, SR 3.3.4.1.3, SR 3.3.4.2.3, SR 3.3.7.1.3, and SR 3.3.8.1.2 to reference TS 5.5.2.11;
- restates Channel Functional Test and Division Functional Test requirements in SR 3.3.1.1.3, SR 3.3.1.1.4, SR 3.3.1.1.5, SR 3.3.1.1.6, SR 3.3.1.4.3, SR 3.3.4.1.2, SR 3.3.4.2.2, SR 3.3.7.1.2 and SR 3.3.8.1.1 to reference TS 5.5.2.11;
- adds TS 5.5.2.11, "SCP";
- corrects GTS Table 3.3.1.1-1 so that the PTS specifies a Sensor Channel Calibration, SR 3.3.1.1.10, for Functions 1b, 1c, 2a, 2g, 12, 24a, and 24b; and
- makes appropriate changes to the bases.

These changes are acceptable because they satisfy the conditions for implementing "Option 3" of DC/COL-ISG-8 for completing site-specific information related to LSSS in the PTS. Therefore, the submission of Departure STD DEP 16.3-100 resolves **RAI 16-65 Issue 1**. This SER discusses the changes of this departure in the affected subsections of Section 16.4, as listed in Section 16.2.

The staff considered that completion of the review of STD DEP 16.3-100 and PTS 5.5.2.11.b was pending NRC approval of the setpoint methodology, which was tracked in the SER with open items as part of **Open Item 16-1** (**RAI 16-65**). The staff finds WCAP-17119-P, Revision 2, acceptable as described in Section 7.1.4 of this report. In addition, the staff finds that the SCP is acceptable, as described in Section 16.4.15.6.11 of this report. Therefore, as described elsewhere in the affected subsections of Section 16.4, the staff concludes that Departure STD DEP 16.3-100 and PTS 5.5.2.11.b are acceptable.

The staff verified that Revision 4 of Parts 2, 4, and 7 of the COL application includes Departure STD DEP 16.3-100, except for the changes the applicant proposed in the supplemental response to RAI 16-65 (dated November 1, 2010). This response revised STD DEP 16.3-100 to include the following:

- restate Channel Functional Test and Division Functional Test requirements in SR 3.3.1.1.3 and SR 3.3.1.1.4; and
- correct GTS Table 3.3.1.1-1 so that the PTS specifies a Sensor Channel Calibration, SR 3.3.1.1.10, for Functions 1b, 1c, 2a, 2g, 12, 24a, and 24b.

Verification that Parts 2, 4, and 7 of a future revision of the COL application includes these changes is being tracked as part of **Confirmatory item 16-65.1**.

2. In the table listing the disposition of the COL items in the response to **RAI 16-21 Issue 13**, the applicant changed the RM for SER Table 16.1 COL Item 64 from "Option 2" to "Option 3." Specifically, the applicant proposed to revise GTS SR 3.3.8.1.2 to state, "Perform CHANNEL CALIBRATION in accordance with TS 5.5.2.11, 'Setpoint Control Program.'" However, Table 16.1 COL Item 64 is not resolved because typical setpoint calculations for the instrumentation functions required by GTS 3.3.8.1 are not included in topical report WCAP-17119-P, "Methodology for South Texas Project Units 3 and 4 ABWR Technical Specification Setpoints Advanced Boiling Water Reactor South Texas Project Units 3 and 4," Revision 0, dated October 2009. The staff asked that the applicant include such calculations in WCAP-17119-P. The applicant's response states that the applicant

will submit for NRC review a revision to topical report WCAP-17119-P that will include the "typical setpoint calculations for the instrumentation functions required by GTS 3.3.8.1." The staff verified that WCAP-17119-P, Revision 2, includes this change in Table 3-80. Based on this response, **RAI 16-65 Issue 2** is resolved.

3. The staff requested that the applicant revise the ABWR GTS Channel Functional Test (CFT) definition (in GTS Section 1.1) to require instrumentation setpoint verification, similar to the Channel Operational Test in NUREG–1431, the Westinghouse STS, and revise the CFT SRs to reference PTS 5.5.2.11 as do the PTS Channel Calibration SRs. The PTS and bases for these SRs should not refer to the instrument channel trip setpoint Allowable Value (AV) because WCAP-17119-P does not use this term. This issue is a supplement to **RAI 16-21 Issue 1**. The applicant's response revises the definitions of Channel Functional Test and Division Functional Test to include setpoint verification. The response also revises SR 3.3.1.1.3, SR 3.3.1.1.4, SR 3.3.1.1.5, SR 3.3.1.1.6, SR 3.3.1.4.3, SR 3.3.4.1.2, SR 3.3.4.2.2, SR 3.3.7.1.2 and SR 3.3.8.1.1 to reference PTS 5.5.2.11. These changes are included in Departure STD DEP 16.3-100. They are consistent with WCAP-17119-P and the implementation of "Option 3" for resolving Table 16.1 COL Items 20, 22, 31, 42, 45, 61, and 64. Instead of omitting all GTS bases references to the AV from the PTS bases, the applicant will submit for NRC staff review a revision to WCAP-17119-P that includes the term "AV." These changes are acceptable as described in the discussion of Departure STD DEP 16.3-100 in Subsection 16.4.15.6.11 of this SER. The staff verified that WCAP-17119-P, Revision 2, includes the term "AV." Based on this response, **RAI 16-65 Issue 3** is resolved.

4. Regarding PTS 5.5.2.11, which the applicant proposed in response to **RAI 16-21 Issue 1**, the staff asked that STPNOC address the following items. The applicant's response states that the revised PTS 5.5.2.11 either addresses or negates the first five items, as follows:

   a. The staff suggested that the applicant retain model paragraph c.1.ii and replace "AV" with "AFT." The applicant retains the term "AV" in this paragraph because it commits to revise WCAP-17119-P to include this term, as discussed in Issue 3 above. This is acceptable.

   b. The staff asked that the applicant add CFT to paragraph c; see Issue 2 above. The applicant revised the GTS definitions of Channel Functional Test and Division Functional Test to require setpoint verification for those instruments controlled by TS 5.5.2.11 and referenced these terms in paragraph c. This is acceptable.

   c. The staff asked that the applicant correct paragraph e by removing "LTSP" in the next to last sentence. Since neither the proposed setpoint methodology nor the GTS use the term "LTSP," the applicant deleted it from PTS 5.5.2.11. This is acceptable.

   d. The staff asked that the applicant explain the phrase in paragraph b, "As-Found Tolerance (AFT) which serves as the Limiting Trip Setpoint (LTSP) in the direction of interest." The staff also asked that the applicant explain using LTSP and what is meant by "LTSP in the direction of interest." The applicant removed this language from paragraph b. This is acceptable.

   e. The staff asked that the applicant explain the use of the term "AV" if it is not an Operability criterion and is not defined in the setpoint methodology. The applicant

commits to revise WCAP-17119-P to include this term, as discussed in Issue 3 above. This is acceptable.

The applicant's response individually addresses the other four items, as follows:

f. The staff asked that the applicant explain how sensor drift and actuation logic drift are accounted for in determining instrumentation trip or actuation settings. The staff's question relates to the details of the setpoint methodology, which is beyond the scope of Chapter 16 of this SER. The staff considered this item unresolved pending NRC approval of the setpoint methodology, which was tracked in the SER with open items, as part of **Open Item 16-1** (**RAI 16-65**). Section 7.1.4 of this report addresses the staff's review of WCAP-17119-P. This issue is considered resolved based on the staff finding as described in Section 7.1.4 of this report that WCAP-17119-P, Revision 2, is acceptable.

g. The staff asked the applicant to confirm that the calculated quantities listed in PTS 5.5.2.11 match the terms calculated in the setpoint methodology. The staff also asked that the applicant discuss whether Channel Statistical Allowance (CSA) and margin should be listed in the SCP specification. The applicant's response states that the calculated quantities listed in PTS 5.5.2.11, NTS, AFT, ALT, and AV, match the terms calculated in Section 3.2 of WCAP-17119-P. (The term "AV" will be included in the revision to WCAP-17119-P that the applicant has committed to, as discussed in Issue 3 above.) This response is acceptable. The response also states that the "CSA is the combination of uncertainties, and by itself, is not tied to Operability; therefore, it is not a term that needs to be included in the Setpoint Control Program." The NTS must provide an acceptable margin to the CSA. The applicant revised PTS 5.5.2.11.b to state, "The NRC approved methodology shall define acceptable margin as margin greater than or equal to the AFT." This is consistent with WCAP-17119-P and is therefore acceptable. Based on this response, the staff concludes that PTS 5.5.2.11 does not need to specify the CSA.

h. The staff asked that the applicant remove the four reviewer's notes from PTS 5.5.2.11, and confirm that the setpoint methodology is consistent with Notes 1, 2, and 3. The staff also asked that the applicant discuss the relevance of Note 4 to the setpoint methodology. The applicant's response removes the reviewer's notes from PTS 5.5.2.11, and confirms that the setpoint methodology is consistent with Notes 1, 2, and 3. Note 1 states, "The methodology allows little variation in the values calculated by different analysts using identical input values (such as uncertainties and channel calibration drift)." Notes 2 and 3 pertain to defining the terms "as-left value" and "as-found value." The staff finds the response acceptable. Note 4 pertains to conditions placed on calculating the total instrument loop uncertainty, the AFT, and the ALT, that must be met if the surveillance compares the as-found value to the NTS instead of the previous as-left value of the instrument trip or actuation setting. The applicant's response explains how the total loop uncertainty, the AFT, and the ALT satisfy these conditions. This item is therefore resolved.

i. The staff asked that the applicant consider whether the SCP specification should reference topical report WCAP-17137-P, "Westinghouse Stability Methodology for the ABWR," concerning the OPRM setpoint determination. The applicant's response proposed to revise PTS 5.5.2.11.b to specify WCAP-17137-P. However, as noted in Subsection 16.4.15.6.11 of this report, this response was superseded by the

applicant's response to **RAI 07.01-16** to not reference WCAP-17137-P in PTS 5.5.2.11.b. Therefore, this issue is resolved.

Based on the staff finding that the applicant's responses to items a through i are acceptable, **RAI 16-65 Issue 4** is resolved.

5. The applicant's response proposes a standard departure from the bases for GTS 3.3.5.1 Required Actions A.1 and C.1 for changes proposed in response to **RAI 16-21 Issue 9**, regarding SER Table 16.1 COL Items 47 and 48. Therefore, **RAI 16-65 Issue 5** is resolved. Subsection 16.4.6.9 of this SER addresses Departure STD DEP 16.3-101.

6. The applicant's response proposes a standard departure from the bases for the 24-hour Frequency of GTS SR 3.3.5.1.6 for changes proposed in response to **RAI 16-21 Issue 11**, regarding SER Table 16.1 COL Item 54. Therefore, **RAI 16-65 Issue 6** is resolved. Subsection 16.4.6.9 of this SER addresses Departure STD DEP 16.3-102.

7. In its response to **RAI 16-21 Issue 18**, the applicant proposed completing the bases for GTS SR 3.7.7.3 by designating the "Technical Requirements Manual" as the site-specific document containing the response time limits for the main-turbine-bypass-system instrumentation functions. This information is intended to resolve Table 16.1 COL Item 103. The staff requested that the applicant discuss in the FSAR the purpose and content of the "Technical Requirements Manual," and the quality assurance controls it plans to implement for it. The staff also requested that the FSAR contain this information to ensure that the acceptance criteria for PTS response time surveillances are adequately controlled. The applicant's response replaces the bracketed phrase "[unit specific document]" in the bases for PTS SR 3.7.7.3 with "FSAR Section 1.1.3." The applicant states this change "will provide consistency with statements regarding the response time testing acceptance criteria in the Bases for SRs 3.3.1.1.12, 3.3.1.1.13, 3.3.1.1.14, 3.3.1.4.5 and 3.3.4.1.5." It will also ensure that the FSAR will provide adequate control of PTS response time surveillances. The staff verified that Revision 4 of the COL application includes this change. For these reasons, **RAI 16-21 Issue 18, RAI 16-65 Issue 7** and Table 16.1 COL Item 103 are resolved.

8. In its response to **RAI 16-21 Issue 24**, the applicant referenced GTS 5.7.1.1(b) in error. The applicant's response to **RAI 16-65 Issue 8** resolves this by stating that the correct reference is GTS 5.7.2 for Table 16.1 COL Item 156. Therefore, **RAI 16-65 Issue 8** is resolved.

9. In its response to **RAI 16-21 Issue 1**, for SER Table 16.1 COL Item 20, in the table listing COL item resolutions, the applicant designated SSLC Function 1c, "SRNM ATWS Permissive," of GTS Table 3.3.1.1-1 as being resolved through "Option 3." The staff requested that the applicant address why Function 1c specifies neither GTS SR 3.3.1.1.10 nor SR 3.3.1.1.11 in Revision 3 of the COL application. The applicant's response revises Table 3.3.1.1-1 Function 1c to specify SR 3.3.1.1.10, "Perform SENSOR CHANNEL CALIBRATION in accordance with TS 5.5.2.11, Setpoint Control Program." The staff verified that Revision 4 of the COL application includes this change. This change resolves **RAI 16-65 Issue 9**.

Based on the above, **RAI 16-65** is resolved.

- STD DEP 16.3-97 Technical Specifications Editorial Changes

The applicant proposed this departure in response to the following RAIs concerning editorial corrections.

**RAI 16-18, Issue 10** The staff requested the applicant to revise the "Applicable Safety Analyses" section of the bases for PTS 3.4.7, 3.4.8, 3.9.7, and 3.9.8 to include the appropriate 10 CFR 50.36 criteria for LCO inclusion in the TS. In the "Applicable Safety Analyses" of these PTS bases sections is the following similar statement:

> Although the system does not meet a specific criterion of the NRC Policy Statement, it was identified in the NRC Policy Statement as an important contributor to risk reduction.

Criterion 4 of 10 CFR 50.36(c)(2)(ii) states that an SSC which operating experience or PRA has shown to be significant to public health and safety must be included in the technical specifications. Additionally, in the STS the corresponding bases sections appropriately include the reference to Criterion 4. For consistency with the STS, the staff requested that the applicant revise the bases sections listed above to reflect the applicable technical specification criteria appropriately. In the response to RAI 16-18 dated August 18, 2009 (ML092320101), the applicant stated that it will make the requested changes to the "Applicable Safety Analyses" section of the bases for PTS 3.4.7, 3.4.8, 3.9.7, and 3.9.8. The staff verified that Revision 4 of the COL application incorporates these changes into the PTS bases, and includes Departure STD DEP 16.3-97 to identify and justify these changes, along with other editorial changes requested by the staff, as noted below. Therefore, **RAI 16-18 Issue 10** is resolved.

**RAI 16-14**. The staff requested the applicant to change the reference in PTS 5.5.2.8.b from "DCD Tier 2, Section 15.7.1" to "FSAR Tier 2, Section 15.7.1." This change is one example of a global comment for DCD Tier 2 references in the PTS bases, and in some places, in the PTS, such as in this case. The PTS and the PTS bases are derived from (1) the ABWR generic DCD plus any departures, and (2) site-specific information. Together, these are FSAR Chapter 16 in the COL application. The applicant's response to **RAI 16-14** dated August 18, 2009 (ML092320101), commits to establish a new standard departure for the requested global change to replace "DCD Tier 2" with "FSAR Tier 2" and incorporate it into Revision 4 of the COL application. This response resolves **RAI 16-14**. The staff verified that Revision 4 of the COL application includes Departure STD DEP 16.3-97 to identify and justify this editorial change, with one exception. The term "DCD" needs to be replaced with "FSAR" in the first paragraph of the "ASA" section of the bases for PTS 3.8.5. Verification that a future revision of the COL application includes this change is being tracked as **Confirmatory Item 16-14**.

In addition to the issues identified in the above RAIs, the staff requested that the applicant make numerous editorial corrections to the PTS and bases. The staff verified that Revision 4 of the COL application includes STD DEP 16.3-97 to identify and justify these editorial changes, as requested by the following RAIs (listed with the dates of the applicant's responses). These editorial RAIs are not described in this report, since they only clarify the intent of the GTS and bases.

- **RAI 16-3**, **RAI 16.5**, and **RAI 16-6** dated August 10, 2009 (ML092240105)
- **RAIs 16-17** through **16-20, RAI 16-26** and **RAI 16-27** dated August 18, 2009 (ML092320101); **RAI 16-32** dated August 26, 2009 (ML092430075); and **RAIs 16-47** through **16-51** dated August 20, 2009 (ML092360173).

Based on the commitments in the applicant's responses to correct the identified items, these RAIs are resolved. Note that the resolution of **RAI 16-18 Issue10** is described above. The staff concludes that the editorial changes described in Departure STD DEP 16.3-97 improve the clarity of the PTS and bases and are therefore acceptable. Therefore, Departure STD DEP 16.3-97 is acceptable. The staff verified that Revision 4 of the COL application includes the editorial corrections identified in the above RAIs and described in Departure STD DEP 16.3-97, with a few exceptions. Verification that a future revision of the COL application includes these remaining changes is being tracked as **Confirmatory Item 16-3**.

The following subsections contain the staff's evaluation of the applicant's responses to the staff's RAIs, other than those discussed above. The following subsections also contain the staff's evaluation of each PTS section and focus on departures from the GTS and bases and the site-specific information to resolve COL Information Item 16.1. Some design changes necessitating Tier 1 and Tier 2 departures from the ABWR DCD also require departures from the GTS and bases. The COL application contains no issues concerning information outside of the DCD, other than the ABWR STP Units 3 and 4 PTLR and instrumentation setpoint methodology that needed to be resolved to enable the staff to complete the review of the PTS and bases.

### 16.4.1 PTS Section 1.0 – Use and Application

This PTS section has the following departure and no COL items:

- STD DEP T1 3.4-1 — Safety-Related I&C Architecture
- STD DEP 16.3-100 — Section 3.3, Setpoint Control Program Implementation

#### 16.4.1.1 *1.1 Definitions*

GTS 1.1 is incorporated by reference into this PTS section with the following departures and no COL items:

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

This departure is based on design changes in I&C architecture, which has a different nomenclature for digital logic components. This different design and nomenclature required revisions to the GTS 1.1 definitions of LOGIC CHANNEL, OUTPUT CHANNEL, and SENSOR CHANNEL so that the PTS definitions accurately reflect the design of STP Units 3 and 4. See Chapter 7 of this SER for the evaluation of this departure.

- STD DEP 16.3-100 — Section 3.3, Setpoint Control Program Implementation

The applicant proposes STD DEP 16.3-100 in response to **RAI 16-65 Issue 1**. The departure revises the definitions of CHANNEL FUNCTIONAL TEST and DIVISION FUNCTIONAL TEST so that these tests "for those instruments controlled by TS 5.5.2.11, Setpoint Control Program, shall include adjustments, as necessary, such that the setpoints are within the necessary range and accuracy." The staff concludes that the revised definitions are acceptable based on the NRC staff's conclusion that the applicant's response to **RAI 16-65 Issue 1** is acceptable. Section 16.2 of this SER lists the subsections of this SER that address the changes to the GTS

and bases that are within the scope of the departure. The staff verified that Revision 4 of the COL application, Parts 2, 4, and 7 includes this departure.

Therefore, based on the above, PTS 1.1 is acceptable.

#### 16.4.1.2 *1.2 Logical Connectors; 1.3 Completion Times; and 1.4 Frequency*

GTS 1.2, 1.3, and 1.4 are incorporated by reference into the PTS with no departures and no COL items. Therefore, PTS 1.2, 1.3, and 1.4 are acceptable.

Based on the above evaluations, PTS Section 1.0 is acceptable.

### 16.4.2 PTS Section 2.0 – Safety Limits

This PTS section has the following departures and one COL item:

- STD DEP 16.2-1 Safety Limit Violation
- STD DEP 16.2-2 Safety Limit [bases only]
- Table 16.1 COL Item 1

#### 16.4.2.1 *2.1 Safety Limits*

GTS 2.1 and bases are incorporated by reference into the PTS and bases with no departures and one COL item.

- Table 16.1 COL Item 1

The applicant completes the bases for PTS 2.1.2, "RCS Pressure SL," by referencing the correct edition of the ASME Boiler and Pressure Vessel Code Section III; in the bases "Applicable Safety Analysis (ASA)" section; and in the bases "References" section in Reference 5. The bracketed wording "Later" and "Later Edition" is replaced with "1989 Edition, excluding Addenda." This change resolves Table 16.1 COL Item 1.

Therefore, based on the above, PTS 2.1 and bases are acceptable.

#### 16.4.2.2 *2.2 Safety Limit Violations*

GTS 2.2 and bases are incorporated by reference into the PTS and bases with two departures and no COL items.

- STD DEP 16.2-1 Safety Limit Violation

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 states that this notification action will be "relocated to a

conduct-of-operations-type procedure developed in accordance with the procedures development plan." This information is 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." For the reasons stated, the changes made by this departure, which are consistent with the BWR/6 STS, Revision 3, are acceptable.

- STD DEP 16.2-2 Safety Limits [bases only]

This departure corrects the bases for GTS 2.1.2, "RCS Pressure Safety Limit," to reflect the ABWR design that uses reactor internal pumps (RIPs), instead of the previous BWR designs that use external pumps in recirculation loops connected to the reactor pressure vessel. The discussion of pressure safety limits for suction and discharge piping is omitted from the bases for PTS 2.1.2. The specified RCS pressure safety limit of 9.13 MPaG reactor steam dome pressure is unchanged. This pressure is equivalent to the maximum allowable RCS pressure of 9.48 MPaG, which is 110 percent of the RCS design pressure of 8.62 MPaG at the lowest elevation of the RCS. This departure corrects the GTS bases so that the PTS bases are technically accurate. Therefore, this departure is acceptable.

Based on the above, PTS 2.2 and bases are acceptable.

Overall, based on the above evaluations, PTS Section 2.0 and bases are acceptable.

### 16.4.3 PTS Section 3.0 – LCO and SR Applicability

This PTS section has the following departures and one COL item:

- 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), [bases only]
- Table 16.1 COL Item 2

#### 16.4.3.1 *LCO 3.0.1, LCO 3.0.2, LCO 3.0.3, LCO 3.0.4, LCO 3.0.5, and LCO 3.0.7*

GTS LCO 3.0.1 through LCO 3.0.5 and bases and GTS LCO 3.0.7 and bases are incorporated by reference into the PTS with no departures and no COL items. Therefore, PTS LCO 3.0.1 through LCO 3.0.5 and bases and PTS LCO 3.0.7 and bases are acceptable.

#### 16.4.3.2 *LCO 3.0.6*

GTS LCO 3.0.6 and bases are incorporated by reference into the PTS and bases with the following departure and no COL items:

- STD DEP 16.3-1 3.0, Limiting Condition for Operation (LCO) Applicability

This departure revises GTS 3.0.6 to correct the specification referenced to the Safety Function Determination Program from "5.8" to "5.6." This editorial change is acceptable.

Therefore, PTS LCO 3.0.6 and bases are acceptable.

#### 16.4.3.3 *SR 3.0.1*

GTS surveillance requirement (SR) 3.0.1 and bases are incorporated by reference into the PTS and the bases with the following departure and one COL item:

- STD DEP 16.3-2 — LCO 3.0 and Surveillance Requirements (SRs), [bases only]

This departure corrects the bases for GTS SR 3.0.1 by replacing "high pressure core flooder (HPCF)" with "reactor core isolation cooling (RCIC)." So the discussion of exceptions to SR 3.0.1 Example b makes logical sense regarding the need to wait for the right plant conditions (adequate steam pressure to operate the RCIC steam turbine-driven pump) following maintenance in order to demonstrate pump operability. This change is needed because the HPCF pump is motor driven. This departure also corrects the GTS reference (SR 3.1.3.4) in the bases Example "a" to the surveillance that includes performing control rod scram time testing at reactor steam dome pressure below normal operating pressure (SR 3.1.4.3). This departure also revises the bracketed value of minimum normal operating pressure from "[5.51 MPaG]" to "[6.55 MPaG]." This revision is based on consistency with the minimum test pressure specified in PTS SR 3.1.4.1, SR 3.1.4.2, and SR 3.1.4.4, which are control rod scram time tests performed at normal operating pressure. The changes in this departure are acceptable because they improve the accuracy and effectiveness of the bases for PTS SR 3.0.1.

- Table 16.1 COL Item 2

In the discussion of exceptions to SR 3.0.1 Example a, the applicant completes the bases for PTS SR 3.0.1 by providing the proper value of minimum reactor steam dome pressure (6.55 MPaG) for performing control rod scram time testing during normal operation. This change resolves Table 16.1 COL Item 2.

Therefore, PTS SR 3.0.1 and bases are acceptable.

#### 16.4.3.4 *SR 3.0.2, SR 3.0.3, SR 3.0.4*

GTS SR 3.0.2 through SR 3.0.4 and bases are incorporated by reference into the PTS with no departures and no COL items. Therefore, PTS SR 3.0.2 through SR 3.0.4 and bases are acceptable.

Overall, based on the above evaluations, PTS Section 3.0 and bases are acceptable.

### 16.4.4 PTS Section 3.1 – Reactivity Control Systems

This PTS section has the following departure and COL items; four proposed departures were withdrawn:

- STD DEP 16.3-3 (withdrawn) — LCO 3.1.7, SLC System [bases only]
- STD DEP 16.3-4 — LCO 3.1.1, Shutdown Margin (SDM) [bases only]
- STD DEP 16.3-68 (withdrawn) — LCO 3.1.3, Control Rod OPERABILITY [bases only]
- STD DEP 16.3-89 (withdrawn) — LCO 3.1.2, Reactivity Anomalies [bases only]

- STD DEP 16.3-90 (withdrawn) LCO 3.1.3, Control Rod OPERABILITY [bases only]
- Table 16.1 COL Items 3 through 7

### 16.4.4.1 *3.1.1 SHUTDOWN MARGIN (SDM)*

GTS 3.1.1 and bases are incorporated by reference into the PTS and bases with the following bases departure and no COL items:

- STD DEP 16.3-4 LCO 3.1.1, Shutdown Margin (SDM) [bases only]

This departure revises the bases for GTS SR 3.1.1.1, to verify that the SDM is within specified limits, to be consistent with test conditions specified in GTS 3.10.7, "Control Rod Testing -Operating," and GTS 3.10.8, "SDM Test – Refueling." The bases for GTS SR 3.1.1.1 state:

> The SDM may be demonstrated…during local criticals, where the highest worth control rod pair is determined by testing. Local critical tests require the withdrawal of out of sequence control rods. This testing would therefore require bypassing of the rod worth minimizer [RWM] to allow the out of sequence withdrawal, and therefore additional requirements must be met (see LCO 3.10.7, "Control Rod Testing-Operating").

The bases for PTS SR 3.1.1.1 replace the last sentence with the following:

> The SDM may be demonstrated…during local criticals, where the highest worth control rod pair is determined by testing. Local critical tests require the withdrawal of out of sequence control rods. This testing is performed in accordance with LCO 3.10.7, "Control Rod Testing-Operating" or LCO 3.10.8, "SDM Test-Refueling" where additional requirements are required to be met.

The new sentence is more appropriate because this departure also revises GTS LCO 3.10.7, which states (the PTS omits the underlined text):

> The requirements of LCO 3.1.6, "Rod Pattern Control," may be suspended <u>and control rods bypassed in the Rod Action and Position Information (RAPI) Subsystem as allowed by SR 3.3.5.1.7</u>, to allow performance of SDM demonstrations, control rod scram time testing, control rod friction testing, and the Startup Test Program, provided conformance to the approved control rod sequence for the specified test is verified by a second licensed operator or other qualified member of the technical staff.

PTS LCO 3.10.7 replaces this sentence with the following (the PTS adds the italicized text):

> The requirements of LCO 3.1.6, "Rod Pattern Control," may be suspended to allow performance of SDM demonstrations, control rod scram time testing, control rod friction testing, and the Startup Test Program, provided *LCO 3.3.5.1, "Control Rod Block Instrumentation" for Function 1.b RWM of Table 3.3.5.1-1 is met with the approved control rod sequence or* conformance to the approved control rod sequence for the specified test is verified by a second licensed operator or other qualified member of the technical staff.

These changes make PTS LCO 3.10.7 and the bases of PTS SR 3.1.1.1 consistent with the conditions in GTS LCO 3.10.8.b. These conditions require either (1) meeting the Mode 2 requirements of LCO 3.3.5.1, "Control Rod Block Instrumentation," for Function 1.b RWM of Table 3.3.5.1-1; or (2) verifying conformance to the approved control rod sequence for the SDM test by a second licensed operator or other qualified member of the technical staff.

The departure also adds

- A note to GTS SR 3.10.7.1 in PTS SR 3.10.7.1 to perform applicable SRs for the RWM function, and

- PTS SR 3.10.7.2, to verify that the movement of control rods is in compliance with the approved control rod sequence for the SDM test by a second licensed operator or other qualified member of the technical staff.

The notes in these SRs require meeting just one of the two SRs at a time. These SRs are consistent with GTS/PTS SR 3.10.8.2 and SR 3.10.8.3. There are also conformance changes in the bases for PTS SR 3.10.7.1 and SR 3.10.7.2.

The changes in this departure extend the LCO 3.10.8 flexibility of depending on either the RWM or a second qualified member of the unit's technical staff during local critical SDM tests to ensure that the movement of control rods complies with the approved control rod sequence. This method is preferred because it has less impact on plant operations during refueling activities. Furthermore, performance of the method that this departure replaces is usually for control rod problems of a longer duration than a test, such as when an inoperable control rod must be fully inserted. Therefore, this departure is acceptable.

Based on the above, PTS 3.1.1 and bases are acceptable.

### 16.4.4.2 *3.1.2 Reactivity Anomalies*

GTS 3.1.2 and bases are incorporated by reference into the PTS and bases with no departures and no COL items. One proposed departure was withdrawn:

- STD DEP 16.3-89 (withdrawn) LCO 3.1.2, Reactivity Anomalies [bases only]

This departure proposes to omit a reference to the rod drop accident from the "Applicable Safety Analysis" section of the bases for PTS 3.1.2. The staff found this departure unacceptable and issued **RAI 16-61** requesting the applicant to withdraw the departure. The applicant's response dated Sept 24, 2009 (ML092710290) states that Departure STD DEP 16.3-89 will be withdrawn because it is unnecessary. The staff reviewed markups of the pages in Parts 2, 4, and 7 of the COL application that are affected by the withdrawal and are included in the applicant's letter responding to the RAI. The staff found the markups acceptable. The staff verified that Revision 4 of the COL application does not include this departure. Based on the withdrawal of this departure, **RAI 16-61** is resolved.

Based on the conformance to the GTS and bases, PTS 3.1.2 and bases are acceptable.

### 16.4.4.3 *3.1.3 Control Rod Operability*

GTS 3.1.3 and the bases are incorporated by reference into the PTS and bases with no departures and one COL item. The following two proposed departures were withdrawn:

- STD DEP 16.3-68 (withdrawn) LCO 3.1.3, Control Rod OPERABILITY [bases only]

This departure proposes to omit a reference to LCO 3.3.5.1 in the bases for GTS 3.1.3, "Actions A.1, A.2, and A.3," from the PTS bases. The GTS bases contain the following sentence:

> If the [fine motion control rod drive] motor is working and the rod is actually stuck, the traveling nut will back down from the bottom of the drive and a rod separation alarm and rod block will result (see LCO 3.3.5.1).

The applicant's justification for this departure is that GTS/PTS LCO 3.3.5.1 does not specify rod block functions related to the "rod separation alarm and rod block." The staff issued **RAI 16-43** requesting additional information to complete the evaluation of this departure. The applicant's response dated August 26, 2009 (ML092430075), states that Departure STD DEP 16.3-68 will be withdrawn and the applicant will reinsert the reference to LCO 3.3.5.1 in the bases for PTS 3.1.3. The applicant further states that the corresponding changes to Parts 2, 4, and 7 of the COL application will be included in a future revision. The staff reviewed mark-ups of the pages in Parts 2, 4, and 7 of the COL application that are affected by the withdrawal and are included in the applicant's response letter. The staff found the markups acceptable. The staff verified that Revision 4 of the COL application does not include this departure. Based on the withdrawal of this departure, **RAI 16-43** is resolved.

- STD DEP 16.3-90 (withdrawn) LCO 3.1.3, Control Rod OPERABILITY [bases only]

This departure proposes to omit Reference 5, which is ABWR DCD Section 15.4.9, "Rod Ejection Accident," from the "Applicable Safety Analyses (ASA)" and "References" sections of the bases for PTS 3.1.3. The staff found this departure unacceptable and issued **RAI 16-62** requesting the applicant to withdraw the departure. The applicant's response dated September 24, 2009 (ML092710290), states that Departure STD DEP 16.3-90 will be withdrawn because it is unnecessary. The staff reviewed markups of the pages in Parts 2, 4, and 7 of the COL application that are affected by the withdrawal and that are included in the applicant's letter responding to the RAI. The staff found the markups acceptable. The staff verified that Revision 4 of the COL application does not include this departure. Based on the withdrawal of this departure, **RAI 16-62** is resolved.

- Table 16.1 COL Item 3

The applicant completes PTS SR 3.1.3.4 and the bases by providing the appropriate limit of 1.44 seconds on control rod scram time from the fully withdrawn position to the 60 percent rod insertion position. The proposed scram time of 1.44 seconds is acceptable, because this value is conservative compared with the values in FSAR Table 15.0-6. This change resolves Table 16.1 COL Item 3.

Based on the above, PTS 3.1.3 and bases are acceptable.

### 16.4.4.4 *3.1.4 Control Rod Scram Times*

GTS 3.1.4 and bases are incorporated by reference into the PTS and bases with no departures. PTS 3.1.4 includes the following COL items:

- Table 16.1 COL Item 4

The applicant completes PTS LCO 3.1.4.a and the bases by providing the allowed number of 8 slow operable control rods, consistent with the FSAR. This change resolves Table 16.1 COL Item 4.

- Table 16.1 COL Item 5

The applicant completes Note 2 of PTS Table 3.1.4-1, "Control Rod Scram Times," and the bases for PTS LCO 3.1.4 by providing the scram time criterion of more than 1.44 seconds from the fully withdrawn position to the 60% rod insertion position for an inoperable control rod. The proposed scram time of 1.44 seconds is acceptable, because this value is conservative compared with the values in FSAR Table 15.0-6. This change resolves Table 16.1 COL Item 5.

- Table 16.1 COL Item 6

The applicant completes PTS Table 3.1.4-1 by providing six scram-time values at "10%, 40%, and 60%" rod insertion for 6.55 MPaG and 7.24 MPaG reactor steam dome pressure. The proposed scram times of 0.42, 1.00, and 1.44 seconds for the insertion of "10%, 40%, 60%" respectively, are acceptable because the values are conservative compared with the values in FSAR Table 15.0-6. This change resolves Table 16.1 COL Item 6.

Based on the above, PTS 3.1.4 and bases are acceptable.

### 16.4.4.5 *3.1.5 Control Rod Scram Accumulators*

GTS 3.1.5 and bases are incorporated by reference into the PTS and bases with no departures and no COL items. Therefore, PTS 3.1.5 and bases are acceptable.

### 16.4.4.6 *3.1.6 Rod Pattern Control*

GTS 3.1.6 and bases are incorporated by reference into the PTS and bases with no departures and no COL items. Therefore, PTS 3.1.6 and bases are acceptable.

### 16.4.4.7 *3.1.7 Standby Liquid Control (SLC) System*

GTS 3.1.7 and bases are incorporated by reference into the PTS and bases with no departures and one COL item. The following proposed departure was withdrawn:

- STD DEP 16.3-3 (withdrawn) LCO 3.1.7, SLC System [bases only]

The staff issued **RAI 16-24** requesting the applicant to remove this departure because the supposed conflict between the bases for GTS LCO 3.1.7 and Condition A regarding the effect of "concentration of boron in solution not within limits" on SLC subsystem operability does not exist. This departure is therefore unacceptable. This departure omits from the PTS bases the following sentence (denoted by the underline) in the bases for GTS LCO 3.1.7, which states:

> …The OPERABILITY of the SLC System is based on the conditions of the borated solution in the storage tank and the availability of a flow path to the RPV, including the OPERABILITY of the pumps and valves. Because the minimum required boron solution concentration is the same for both ATWS mitigation and cold shutdown (unlike some previous reactor designs) then if the boron solution concentration is less than the required limit, both SLC subsystems shall be declared inoperable. Two SLC subsystems are required to be OPERABLE, each containing an OPERABLE pump, a motor operated injection valve, and associated piping, valves, and instruments and controls to ensure an OPERABLE flow path.

The sentence regarding operability appears to be inconsistent with GTS 3.1.7 Action A, which requires restoring the concentration of boron in solution to within limits in 72 hours for the condition of "concentration of boron in solution not within limits." However, this is not the case, as evidenced by Condition C, which states, "Two SLC subsystems inoperable for reasons other than Condition A. That is, Condition A could have been written, "Two SLC subsystems inoperable due to concentration of boron in solution not within limits." Because this departure is unnecessary, the staff requested the applicant to remove it. The applicant's response to RAI 16-24 dated August 18, 2009 (ML092320101) withdraws this departure. The staff reviewed markups of the pages in Parts 2, 4, and 7 of the COL application that are affected by the withdrawal and are included in the applicant's letter responding to the RAI. The staff found the markups acceptable. Based on the withdrawal of this departure, **RAI 16-24** is resolved. The staff verified that Revision 4 of the COL application does not include this departure.

- Table 16.1 COL Item 7

The applicant completes PTS Figure 3.1.7-1, "Sodium Pentaborate Solution Temperature/Concentration Requirements," by providing, in accordance with the figure's Reviewer's Note, the appropriate net-positive suction head (NPSH) temperature upper operating limit of 43° C for SLC pump operation. In addition, the applicant provides in PTS Figure 3.1.7-1 the corresponding tank maximum sodium pentaborate solution concentration value of 23.2% that corresponds to the 43° C temperature upper operating limit. The applicant also removes the reviewer's note from PTS Figure 3.1.7-1 because the note is no longer needed. These site-specific values are consistent with the FSAR and are therefore acceptable. This change resolves Table 16.1 COL Item 7.

Based on the above, PTS 3.1.7 and bases are acceptable.

Overall, based on the above evaluations, PTS Section 3.1 and bases are acceptable.

### 16.4.5 PTS Section 3.2 – Power Distribution Limits

This PTS section has the following departure and one COL item:

- STD DEP 16.3-95 — LCO 3.2.3 Linear Heat Generation Rate (LHGR) (Non-GE Fuel)

- Table 16.1 COL Item 8 (bases only)

#### 16.4.5.1 *3.2.1 Average Planar Linear Heat Generation Rate*

GTS 3.2.1 and bases are incorporated by reference into the PTS and bases with no departures and no COL items. Therefore, PTS 3.2.1 and bases are acceptable.

#### 16.4.5.2 *3.2.2 Minimum Critical Power Ratio (MCPR)*

GTS 3.2.2 and bases are incorporated by reference into the PTS and bases with no departures and no COL items. Therefore, PTS 3.2.2 and bases are acceptable.

#### 16.4.5.3 *3.2.3 Linear Heat Generation Rate*

The applicant does not incorporate GTS 3.2.3, "Linear Heat Generation Rate," and bases into the PTS and bases, as described in the following departure and COL item discussions.

- STD DEP 16.3-95 — LCO 3.2.3 Linear Heat Generation Rate (LHGR) (Non-GE Fuel)

This departure omits GTS 3.2.3, "Linear Heat Generation Rate (LHGR), (Non-GE Fuel)" and bases from the PTS and bases. This change is acceptable because this specification is not applicable to STP Units 3 and 4 at this time.

- Table 16.1 COL Item 8 (bases only)

The "Background" and "Applicable Safety Analyses" sections of the bases for GTS 3.2.3, "Linear Heat Generation Rate (LHGR)," list Reference 1, which is "[Non GE Fuel Analysis]." The applicant's response to **RAI 16-1** states that GTS 3.2.3, "Linear Heat Generation Rate (LHGR), (Non-GE Fuel)" and bases will be omitted from the PTS and bases because this specification is not applicable to the STP Units 3 and 4 COL application at this time. The applicant's justification for omitting GTS 3.2.3 from PTS Section 3.2 is in new Departure STD DEP 16.3-95. Table 16.1 COL Item 8 is resolved because this departure eliminates the bracketed reference to a non-GE fuel analysis document.

Overall, based on the above evaluations, PTS Section 3.2 and bases are acceptable.

### 16.4.6 PTS Section 3.3 – Instrumentation

This PTS section has the following departures and COL items:

- STD DEP T1 2.3-1 — Deletion of 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 2.14-1 — Hydrogen Recombiner Requirements Elimination
- STD DEP T1 3.4-1 — Safety-Related I&C Architecture
- STD DEP 7.3-17 — Automatic Depressurization System (ADS) Electrical Interface [bases only]

| | |
|---|---|
| • STD DEP 7.5-1 | Post-Accident Monitoring (Drywell Pressure) |
| • STD DEP 8.3-1 | Plant Medium Voltage Electrical System Design |
| • STP DEP 10.4-5 | Condensate and Feedwater System [bases only] |
| • STD DEP 16.3-39 (withdrawn) | LCO 3.3.4.2, Feedwater and Main Turbine Trip Instrumentation |
| • STD DEP 16.3-50 | LCO 3.3.1.4, ESF Actuation Instrumentation |
| • 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 [bases only] |
| • STD DEP 16.3-57 | LCO 3.3.1.2, Reactor Protection System (RPS) and Main Steam Isolation Valve (MSIV) Actuation [bases only] |
| • 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 [bases only] |
| • STD DEP 16.3-63 | LCO 3.3.8.2, Reactor Coolant Temperature Monitoring-Shutdown [bases only] |
| • 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 [bases only] |
| • STD DEP 16.3-67 | LCO 3.3.5.1, Control Rod Block Instrumentation [bases only] |
| • STD DEP 16.3-77 | LCO 3.3.6.1, Post Accident Monitoring (PAM) Instrumentation [bases only] |
| • STD DEP 16.3-78 | LCO 3.3.6.1, Post Accident Monitoring (PAM) Instrumentation |
| • 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 [bases only]) |
| • STD DEP 16.3-83 | LCO 3.3.1.3, Standby Liquid Control (SLC) and Feedwater Runback (FWRB) Actuation [bases only] |
| • 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 [bases only] |

- 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 [bases only]
- STD DEP 16.3-91 — LCO 3.3.1.1, SSLC Sensor Instrumentation [bases only]
- STD DEP 16.3-92 — LCO 3.3.1.1, SSLC Sensor Instrumentation [bases only]
- STD DEP 16.3-93 — LCO 3.3.1.1, SSLC Sensor Instrumentation [bases only]
- STD DEP 16.3-94 — LCO 3.3.1.4, ESF Actuation Instrumentation
- STD DEP 16.3-98 — SR 3.3.1.1.4, DIVISION FUNCTIONAL TEST for SRNMs [bases only]
- STD DEP 16.3-99 — Bases Allowable Value Misstatements [bases only]
- 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 [bases only]
- STD DEP 16.3-102 — Bases SR 3.3.5.1.6 [bases only]
- STD DEP 16.3-104 — SR 3.3.4.2.2 – CHANNEL FUNCTIONAL TEST -Feedwater Pump and Main Turbine Trip Instrumentation [bases only]
- 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 [bases only]
- Table 16.1 COL Items 9 through 68

### 16.4.6.1 *3.3.1.1 Safety System Logic and Control Sensor Instrumentation*

GTS 3.3.1.1 and bases are incorporated by reference into the PTS and bases with the following departures and COL items:

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

This departure addresses the omission of the MSIV closure and scram on high radiation. The departure affects the PTS as follows:

- PTS 3.3.1.1 and the bases have been modified to remove the main steam tunnel radiation high functions (automatic scram and MSIV closure).
- PTS 3.3.6.1 and the bases have been modified to remove instrumentation monitoring functions for PAM of coolant radiation in the main steam line. 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, is in NUREG–0800, Appendix 7-A.)

These changes are acceptable based on the evaluation of this departure in Subsection 11.5.4 of this SER. This departure affects Tier 1 and Tier 2 information in the ABWR DCD.

- STD DEP T1 2.4-2 Feedwater Line Break Mitigation

This departure addresses the addition of feedwater line break mitigation logic. The 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 an FWLB in the drywell has occurred. 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 are acceptable based on the evaluation of this departure in Chapter 6 of this SER. This departure affects Tier 1 and Tier 2 information in the ABWR DCD.

- STD DEP T1 2.4-3 RCIC Turbine/Pump

This departure addresses RCIC turbine pump design improvements and system simplification. This departure affects Tier 1 and Tier 2 information in the ABWR DCD. The departure also affects the PTS and bases by:

- Adding the phrase “and high exhaust pressure equipment” in 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”; and

- 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.

- STD DEP T1 3.4-1 Safety-Related I&C Architecture [bases only]

This departure addresses the following five primary changes:

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 that changed the implementation architecture
5. Testing and surveillance changes for SSLC instrumentation

These changes are acceptable based on the evaluation of this departure in Chapter 7 of this SER.

- STD DEP 8.3-1 Plant Medium Voltage Electrical System Design [bases only]

See the evaluation of this departure in Subsection 16.4.11.1 of this SER.

- STD DEP 16.3-84 LCO 3.3.1.1, SSLC Sensor Instrumentation

In this departure, the applicant changes the GTS 3.3.1.1 Actions Condition referenced in GTS Table 3.3.1.1-1 from Condition G to Condition H for Function 3c, "Reactor Vessel Steam Dome Pressure - High, SLCS and FWRB Initiation," and Function 7c, "Reactor Vessel Water Level -Low, Level 2, SLCS and FWRB Initiation." In accordance with GTS 3.3.1.1 Action E, if any Required Action and associated Completion Time of Condition A, B, C, or D is not met, the Actions Condition specified for the affected function in Table 3.3.1.1-1 must be immediately entered. The specified Applicability for Functions 3c and 7c is Modes 1 and 2. However, Action G only requires a unit shutdown to Mode 2, which would leave the unit in a mode in which Functions 3c and 7c apply. Therefore, referencing Condition G is not appropriate. Actions Condition H is the appropriate reference because Action H requires a unit shutdown to Mode 3. This departure is acceptable because Action H will ensure that the unit exits the Applicability of these Functions in the event that Condition E is entered for these Functions.

- STD DEP 16.3-85 LCO 3.3.1.1, SSLC Sensor Instrumentation [bases only]

The applicant proposes to change the bases for GTS 3.3.1.1 regarding the ADS to state the correct capacity for the ADS accumulators to operate the safety relief valves with no external source of nitrogen. This change is consistent with DCD Subsection 5.2.2.4.1, Section 6.7.2, and Subsection 7.3.1.1.1.2. However, the applicant's response to **RAI 16-55** dated September 24, 2009 (ML092710290) states that the discussion of ADS accumulator capacity is also in the bases for GTS SR 3.5.1.3, which state:

> The designed pneumatic supply pressure requirements for the accumulator are such that, following a failure of the pneumatic supply to the accumulator, at least one valve actuation can occur with the drywell at design pressure, or five valve actuations can occur with the drywell at atmospheric pressure (Ref. 10 [7.3.1.1.1.2]). The ECCS safety analysis assumes only one actuation to achieve the depressurization required for operation of the low pressure ECCS.

Because the bases for GTS 3.5.1 already correctly state the capacity for the ADS accumulators to operate the safety relief valves with no external source of nitrogen, the applicant is revising this departure to omit the ADS capacity discussion from the bases for PTS 3.3.1.1. The staff found this administrative removal of duplicate information from the GTS bases reasonable. This response therefore resolved **RAI 16-55**. Based on the resolution of **RAI 16-55**, Departure STD DEP 16.3-85 is acceptable.

- STD DEP 16.3-91 — LCO 3.3.1.1, SSLC Sensor Instrumentation [bases only]

The applicant proposes to change the title of Function 33, "Control Building Basement Equipment Cubicle," in the bases for GTS 3.3.1.1 with the correct title, "RCW/RSW Heat Exchanger Room Water Level – High." An editorial correction of a title in the bases for GTS 3.3.1.1 is an administrative change. Therefore, STD DEP 16.3-91 is acceptable.

- STD DEP 16.3-92 — LCO 3.3.1.1, SSLC Sensor Instrumentation [bases only]

The applicant proposes to clarify the bases for GTS 3.3.1.1, Required Actions P.1, P.2, R.1, and R.2 by including other conditions (e.g., not placed in trip, not isolated) that also result in entering the specified actions for Condition E (Required Action and associated Completion Time of Condition A, B, C, or D not met). Specifically, the revised paragraph in the bases for PTS 3.3.1.1, Required Actions P.1, P.2, R.1, and R.2 states, "If the Function is not restored to OPERABLE status or placed in trip within the allowed Completion Time [Action A, B, C, or D], or if the affected penetration flow path(s) are not isolated within the allowed Completion Time [Action K], the plant must be placed in a MODE or other specified condition where the LCO does not apply."

For the following functions, Action E requires entering Action K, which requires isolating the affected penetration flow path(s) within 1 hour. Action R must be entered if Required Action and associated Completion Time of Condition K are not met. Action R requires a unit shutdown to Mode 4.

3b, "Reactor Vessel Steam Dome Pressure – High, Isolation initiation"

6b, "Reactor Vessel Water Level – Low, Level 3, Isolation initiation"

7b, "Reactor Vessel Water Level – Low, Level 2, Isolation initiation"

24b, "Fuel Handling Area Exhaust Air Radiation – High"

25, "RCIC Steam Line Flow – High"

26, "RCIC Steam Supply Line Pressure – Low"

27, "RCIC Equipment Area Temperature – High"

28, "RHR Area Temperature – High"

29, "Reactor Water Cleanup (CUW) Differential Flow – High"

30, "CUW Regenerative Heat Exchanger Temperature – High"

31, "CUW non-regenerative Heat Exchanger Temperature – High"

32, "CUW Equipment Area Temperature – High"

33, “Reactor Building Cooling Water - Reactor Service Water (RCW/RSW) Heat Exchanger Room Water Level – High”

For the following functions, Action E requires entering Action P, which requires a unit shutdown to Mode 4.

11b, “Drywell Pressure – High, ESF Initiation”

11d, “Drywell Pressure – High, Feedwater Line Break Mitigation Initiation”

15, “Feedwater Line Differential Pressure – High”

Because this change only clarifies the intent of Actions P and R if Action E is entered for the listed SSLC Functions, STD DEP 16.3-92 is acceptable.

- STD DEP 16.3-93 — LCO 3.3.1.1, SSLC Sensor Instrumentation [bases only]

This departure corrects a typographical misstatement in the bases of GTS SR 3.3.1.1.10. Specifically, “SR 3.2.1.1.10” is changed to read “SR 3.3.1.1.10.” Because this is only an editorial change, this departure is acceptable.

- STD DEP 16.3-98 — SR 3.3.1.1.4, DIVISION FUNCTIONAL TEST for SRNMs [bases only]

The applicant proposes STD DEP 16.3-98 in response to **RAI 16-34** dated August 18, 2009 (ML092320101), to remove an out-of-place reference to the APRM – High functions in the bases for GTS SR 3.3.1.1.4, the Division Functional Test for SRNM Functions. The correct Division Functional Test for the APRMs is SR 3.3.1.1.5. The correction of a factual error in the GTS bases does not change any GTS requirements. The staff verified that Revision 4 of the COL application includes STD DEP 16.3-98. Therefore, STD DEP 16.3-98 is acceptable and **RAI 16-34** is resolved.

- STD DEP 16.3-99 — Bases Allowable Value Misstatements [bases only]

The applicant proposes STD DEP 16.3-99 in the response to **RAI 16-37** dated August 18, 2009. The departure omits the following statement of the GTS bases from the PTS bases:

> If the as found setpoint is not within its required Allowable Value, the plant specific setpoint methodology may be revised, as appropriate, if the history and all other pertinent information indicate a need for the revision.

Omitting this statement from the PTS bases is appropriate because it conflicts with PTS 5.5.2.11, “Setpoint Control Program.” This specification would require declaring the instrument channel inoperable and entering the condition into the plant’s corrective action program. This departure deletes two additional statements from the GTS bases:

> The setpoint shall be left set consistent with the assumptions of the current plant specific setpoint methodology.
>
> The as-left trip point shall be consistent with the assumptions of the current plant specific setpoint methodology.

Omitting these statements from the PTS bases is appropriate because the statements duplicate requirements in PTS 5.5.2.11. This departure omits these three statements from the PTS bases for the following SRs:

| | |
|---|---|
| SR 3.3.1.1.3 and SR 3.3.1.1.5 | DIVISION FUNCTIONAL TEST |
| SR 3.3.1.1.6 | CHANNEL FUNCTIONAL TEST |
| SR 3.3.1.1.10 | SENSOR CHANNEL CALIBRATION |
| SR 3.3.1.1.11 | CHANNEL CALIBRATION |
| SR 3.3.1.4.6 | SENSOR CHANNEL CALIBRATION |
| SR 3.3.4.1.2 | CHANNEL FUNCTIONAL TEST |
| SR 3.3.4.1.3 | SENSOR CHANNEL CALIBRATION |
| SR 3.3.4.2.2 | CHANNEL FUNCTIONAL TEST |
| SR 3.3.4.2.3 | CHANNEL CALIBRATION |
| SR 3.3.5.1.1 and SR 3.3.5.1.2 | CHANNEL FUNCTIONAL TEST |
| SR 3.3.7.1.3 | CHANNEL CALIBRATION |

The staff found the proposed changes responsive to the RAI request. The omission of these sentences from the bases for the corresponding PTS SRs resolves the conflict with and duplication of PTS 5.5.2.11 requirements. The staff verified that Revision 4 of the COL application, Parts 2, 4, and 7 includes this departure. Therefore, STD DEP 16.3-99 is acceptable and **RAI 16-37** is resolved.

- STD DEP 16.3-100 — Section 3.3, Setpoint Control Program Implementation

The applicant proposes STD DEP 16.3-100 in response to **RAI 16-65 Issue 1** dated January 13, 2010 (ML100141738). The departure omits the "allowable value" column of GTS Table 3.3.1.1-1 from PTS Table 3.3.1.1-1 as part of implementing "Option 3" of DC/COL-ISG-8 for limiting safety system settings. Removal of the AVs from Table 3.3.1.1-1 includes removing Footnote (c), which applies to the AV for Function 2f, "OPRM." This is related to Table 16.1 COL Item 12, which is discussed below. The departure also revises the following GTS SRs so that PTS 3.3.1.1 requires performing these SRs in accordance with TS 5.5.2.11, "Setpoint Control Program":

- SR 3.3.1.1.3, Division Functional Test
- SR 3.3.1.1.4, Division Functional Test
- SR 3.3.1.1.5, Division Functional Test;
- SR 3.3.1.1.6, Channel Functional Test;
- SR 3.3.1.1.10, Sensor Channel Calibration; and
- SR 3.3.1.1.11, Channel Calibration.

The departure also makes appropriate changes to the "ASA, LCO, and Applicability" section of the bases for GTS 3.3.1.1. The changes to GTS 3.3.1.1 and bases are acceptable based on the NRC staff's conclusion that the applicant's response to **RAI 16-65 Issue 1** is acceptable. Therefore, the parts of STD DEP 16.3-100 that change GTS 3.3.1.1 and bases are acceptable. The changes to GTS 3.3.1.1 also complete Table 16.1 COL Items 20 and 22, as described later in this subsection. The staff verified that Revision 4 of the COL application, Parts 2, 4, and 7 includes this departure. Section 16.2 of this SER lists the subsections of this SER that address the changes to the GTS and bases that are within the scope of the departure. The beginning

part of Section 16.4 of this SER describes all of the changes to the GTS and bases that are within the scope of the departure.

- 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 [bases only]

The applicant proposes STD DEP 16.3-105 in response to **RAI 16-70** dated August 11, 2010 (ML102250454). The departure clarifies the bases for action requirements to isolate a main steamline. Specifically, the departure adds the following sentences to the bases for PTS 3.3.1.1 Action Q, PTS 3.3.1.2 Action L, and PTS 3.6.1.3 Action A:

> An analysis of the effects of flow-induced vibration on the remaining open MSIVs and other critical components in the reactor and steam systems must be performed prior to continued operation with an isolated main steamline. Continued plant operation must remain within the bounds of this analysis.

The departure also adds this information to FSAR Subsections 7.2.1.1.4.3 "RPS Logic," Item (3) "MSL [main steamline] Isolation Bypass," and 10.3.2.1 "General Description." The staff had requested this clarification in the PTS bases (and also in FSAR, Chapters 7 and 10) to address 10 CFR Part 21 reports from GE (ML022380417 and ML022810290) that describe an inadequate analysis by GE to support three main steamline operation at an operating licensed BWR/4 facility. GE had failed to fully evaluate the effects of steam flow-induced vibration through the remaining open MSIVs during operation with steam flow greater than that for normal (four main steamline) operation; i.e., operation with steam flow in each steamline above the maximum normal steam flow when the unit is operating at 100 percent RTP. The staff requested this clarification because the ABWR DCD describes neither an analysis of three main steamline operation nor any limitations that should be considered respected during three main steamline operation. The staff finds that the proposed changes will ensure that the licensee will only initiate three main steamline operation of STP Unit 3 or 4 if it has analyzed the effects of flow-induced vibration on the remaining open MSIVs and other critical components in the reactor and steam systems, and has determined that the effects are acceptable. The proposed changes will also ensure that such operation will stay within the bounding conditions deemed acceptable by that analysis. The staff concludes that the proposed changes are an acceptable means for STP Units 3 and 4 to address the issue identified in the referenced 10 CFR Part 21 reports. Therefore, STD DEP 16.3-105 is acceptable, and **RAI 16-70** is resolved. Verification that this change is included in a future revision of the COL application is being tracked as **Confirmatory Item 16-70.**

- Table 16.1 COL Item 9

The applicant completes this item in the bases for PTS 3.3.1.1 Function 2a, "APRM Neutron Flux – High, Setdown," by providing "51" as the minimum number of LPRM inputs for each APRM division. The design provides for 52 LPRMs for each APRM division. As described in the discussion of the revised response to **RAI 16-1** in the beginning of Section 16.4 of this SER, the applicant completes this item by providing a useable bounding value. The revised response resolved Table 16.1 COL Item 9. The staff verified that Revision 4 of the COL application specifies the value of 51 as the minimum number of LPRM inputs for each APRM division.

- Table 16.1 COL Item 10

The applicant completes this item in PTS Table 3.3.1.1-1 by replacing "≥ [80]% RTP" with "≥ 75% RTP" as the site-specific Applicability for SSLC sensor instrumentation Function 2e, "APRM – Rapid Core Flow Decrease," and the associated bases. The applicant also removes the brackets from "≥ [40]% RTP" because "≥ 40% RTP" is the site-specific Applicability for SSLC sensor instrumentation Function 13, "Turbine Stop Valve – Closure," and Function 14, "Turbine Control Valve Fast Closure, Trip Oil Pressure – Low." These applicability conditions are consistent with the accident analysis assumptions and are therefore acceptable. These changes resolve Table 16.1 COL Item 10.

- Table 16.1 COL Item 11

The applicant completes this item in PTS Table 3.3.1.1-1 Note (b) by removing the brackets from "≤ [0.0001]% RTP" because "> 0.0001% RTP" in Mode 2 and Mode 5, is the site-specific Applicability for SSLC sensor instrumentation Function 1b, "SRNM Neutron Flux – Short Period." Note (b) states, "Trip automatically bypassed within each SRNM and not required to be OPERABLE at reactor power levels ≤ 0.0001% RTP." This applicability condition is consistent with the design and accident analysis assumptions and is therefore acceptable. This change resolves Table 16.1 COL Item 11.

- Table 16.1 COL Item 12

The applicant proposed to complete this item in PTS Table 3.3.1.1-1 by removing the brackets from Footnote (c) to SR 3.3.1.1.10, SENSOR CHANNEL CALIBRATION for SSLC sensor instrumentation Function 2f, "Oscillation Power Range Monitor," because the bracketed information is correct. Note (c) states:

(1) Neutron flux oscillations within any OPRM cell have a period between 1.15 seconds and 3.35 seconds that persists for 10 cycles with a peak to peak amplitude of that is 10% of point or greater.

(2) Neutron flux oscillations within any OPRM cell that have a period between 0.31 and 2.2 seconds become larger than 30% of point within 3 periods or oscillations with the specified period range that are greater than 10% of point grow by 30% of point within 3 cycles.

The applicant removed this footnote from PTS Table 3.3.1.1-1 as part of STD DEP 16.3-100, which is acceptable as described in Subsection 16.4.15.6.11 of this report. This change resolves Table 16.1 COL Item 12.

- Table 16.1 COL Item 13

The applicant completes this item in PTS SR 3.3.1.1.2 and bases (verify the absolute difference between the average power range monitor (APRM) channels and the calculated power is ≤ 2% RTP) by removing the brackets from the Frequency of 7 days for the following SSLC sensor instrumentation Functions in Table 3.3.1.1-1.

2b, "APRM Simulated Thermal Power – High, Flow Biased"

2c, "APRM Fixed Neutron Flux – High"

This change resolves Table 16.1 COL Item 13.

- Table 16.1 COL Item 14

The applicant completes this item in PTS SR 3.3.1.1.3 and bases (perform DIVISION FUNCTIONAL TEST) by removing the brackets from the Frequency of 7 days, for the following SSLC sensor instrumentation Functions in Table 3.3.1.1-1.

1a (MODE 2), “Startup Range Neutron Monitors (SRNM) Neutron Flux – High”

1b (MODE 2), “SRNM Neutron Flux – Short Period”

1d (MODES 1 and 2), “SRNM Inop”

2a (MODE 2), “Average Power Range Monitors (APRM) Neutron Flux – High, Setdown”

This change resolves Table 16.1 COL Item 14.

- Table 16.1 COL Item 15

The applicant completes this item in PTS SR 3.3.1.1.4 and bases (Perform DIVISION FUNCTIONAL TEST in accordance with TS 5.5.2.11, SCP) by removing the brackets from the Frequency of 31 days, for the following SSLC sensor instrumentation Functions in Table 3.3.1.1-1.

1a (MODE 5), “Startup Range Neutron Monitors (SRNM) Neutron Flux – High”

1b (MODE 5), “SRNM Neutron Flux – Short Period”

1d (MODE 5), “SRNM Inop”

This change resolves Table 16.1 COL Item 15.

- Table 16.1 COL Item 16

The applicant completes this item in the Frequency of PTS SR 3.3.1.1.5 and bases (perform DIVISION FUNCTIONAL TEST in accordance with TS 5.5.2.11, SCP) by replacing “[92] days” with the site-specific value of “31 days” for the following SSLC sensor instrumentation Functions: 1c, 2b, 2c, 2d, 2e, 2f, 2g, 3a, 3b, 4, 5, 6a, 6b, 7a, 7b, 8a, 8b, 8c, 9a, 9b, 9c, 10, 11a, 11b, 11c, 11d, 12 (MODES 1 and 2), 13, 14, 15, 16a, 16b, 17, 18, 19, 20, 21, 22, 23, 24a, 24b, 25, 26, 27, 28, 29, 30, 31, 32, and 33. Note that Departure STD DEP T1 2.4-2 adds Functions 11d and 15 to the PTS as described previously in this section. The 31-day Frequency is acceptable as this SER describes at the beginning of Section 16.4 in the discussion of the response to **RAI 16-21 Issue 4**. This change resolves Table 16.1 COL Item 16. The staff verified that Revision 4 of the COL application includes this change.

- Table 16.1 COL Item 17

The applicant completes this item in the Frequency of PTS SR 3.3.1.1.5 and bases (perform DIVISION FUNCTIONAL TEST in accordance with TS 5.5.2.11, SCP) by deleting GTS SSLC sensor instrumentation Functions 15a and 15b in accordance with Departure STD DEP T1 2.3-1, which this SER describes at the beginning of this subsection. Based on the resolution of this departure, Table 16.1 COL Item 17 is resolved.

- Table 16.1 COL Item 18

The applicant completes this item in the Frequency of PTS SR 3.3.1.1.6 and bases (perform CHANNEL FUNCTIONAL TEST in accordance with TS 5.5.2.11, SCP) by replacing "[92] days" with the site-specific value of "31 days" for the following SSLC sensor instrumentation Functions:

3c, "Reactor Vessel Steam Dome Pressure – High, Standby Liquid Control System (SLCS) and Feedwater Runback (FWRB) Initiation"

7c, "Reactor Vessel Water Level - Low, Level 2, SSLC and FWRB Initiation"

This change is acceptable as this SER describes at the beginning of Section 16.4 in the discussion of the response to **RAI 16-21 Issue 4**. This change resolves Table 16.1 COL Item 18. The staff verified that Revision 4 of the COL application includes this change.

- Table 16.1 COL Item 19

The applicant completes this item in the Frequency of PTS SR 3.3.1.1.8 and bases (verify the SRNM and APRM channels overlap within at least 1/2 decade) by removing the brackets from the site-specific 7-day Frequency for the following SSLC sensor instrumentation Functions:

1a (MODE 2), "SRNM Neutron Flux – High"

1b (MODE 2), "SRNM Neutron Flux – Short Period"

2a (MODE 2), "(APRM) Neutron Flux – High, Setdown"

This change resolves Table 16.1 COL Item 19 because it is consistent with the STS.

- Table 16.1 COL Item 20

The applicant completes PTS SR 3.3.1.1.10 using "Option 3" of DC/COL-ISG-8 by proposing to revise GTS SR 3.3.1.1.10 in the COL application (Revision 4) to state, "Perform CHANNEL CALIBRATION in accordance with TS 5.5.2.11, 'Setpoint Control Program (SCP),'" and by establishing PTS 5.5.2.11.

PTS SR 3.3.1.1.10 is acceptable based on the resolution of **RAI 16-65 Issue 1**, which this SER describes at the beginning of Section 16.4, and in the evaluation of Departure STD DEP 16.3-100 in this subsection. However, Table 16.1 COL Item 20 remained unresolved pending completion of the review of the setpoint methodology and PTS 5.5.2.11.b, which was tracked in the SER with open items as part of **Open Item 16-1** (**RAI 16-65**). The staff finds that WCAP-17119-P is acceptable, as described in Section 7.1.4 of this report. In addition, the staff finds that the SCP specification is acceptable, as described in Section 16.4.15.6.11 of this report. Therefore, Table 16.1 COL Item 20 is resolved.

PTS SR 3.3.1.1.10 is specified for the following SSLC sensor instrumentation Functions listed in PTS Table 3.3.1.1-1; *note that the PTS adds Functions 11d and 15, in accordance with Departure STD DEP T1 2.4-2, which is described at the beginning of this subsection.

1a SRNM Neutron Flux – High

1b SRNM Neutron Flux – Short Period (GTS Table 3.3.1.1-1 does not list SR 3.3.1.1.10 for this function; see the discussion of **Issue 1** of **RAI 16-65** in the beginning of Section 16.4 of this SER.)

1c SRNM ATWS Permissive (GTS Table 3.3.1.1-1 does not list SR 3.3.1.1.10 for this function; see the discussion of **Issue 9** of **RAI 16-65** in the beginning of Section 16.4 of this SER.)

2a APRM Neutron Flux – High, Setdown (GTS Table 3.3.1.1-1 does not list SR 3.3.1.1.10 for this function; see the discussion of **Issue 1** of **RAI 16-65** in the beginning of Section 16.4 of this SER.)

2b APRM Simulated Thermal Power – High, Flow Biased

2c APRM Fixed Neutron Flux – High

2e Rapid Core Flow Decrease

2f Oscillation Power Range Monitor

2g APRM ATWS ADS Permissive (GTS Table 3.3.1.1-1 does not list SR 3.3.1.1.10 for this function; see the discussion of **Issue 1** of **RAI 16-65** in the beginning of Section 16.4 of this SER.)

3a Reactor Vessel Steam Dome Pressure – High, RPS Trip Initiation

3b Reactor Vessel Steam Dome Pressure – High, Isolation Initiation

4 Reactor Steam Dome Pressure – Low (Injection Permissive)

5 Reactor Vessel Water Level – High, Level 8

6a Reactor Vessel Water Level – Low, Level 3, RPS Trip Initiation

6b Reactor Vessel Water Level – Low, Level 3, Isolation Initiation

7a Reactor Vessel Water Level – Low, Level 2, ESF Initiation

7b Reactor Vessel Water Level – Low, Level 2, Isolation Initiation

8a Reactor Vessel Water Level – Low, Level 1.5, ESF Initiation

8b Reactor Vessel Water Level – Low, Level 1.5, Isolation Initiation

8c Reactor Vessel Water Level – Low, Level 1.5, ATWS ADS Inhibit

9a Reactor Vessel Water Level – Low, Level 1, ADS A, CAMS A, LPFL A & LPFL C Initiation

9b Reactor Vessel Water Level – Low, Level 1, ADS B, Diesel Generator, RCW, CAMS B, & LPFL B Initiation

9c Reactor Vessel Water Level – Low, Level 1, Isolation Initiation

10 Main Steam Isolation Valve - Closure

11a Drywell Pressure – High, RPS Initiation

11b Drywell Pressure – High, ESF Initiation

11c Drywell Pressure – High, Isolation Initiation

11d* Drywell Pressure – High, Feedwater Line Break Mitigation Initiation

12 CRD Water Header Charging Pressure – Low (During operation in Mode 5.) (GTS Table 3.3.1.1-1 does not list SR 3.3.1.1.10 for this function in Modes 1 and 2; see the discussion of **Issue 1** of **RAI 16-65** in the beginning of Section 16.4 of this SER.)

13 Turbine Stop Valve – Closure

14 Turbine Control Valve Fast Closure, Trip Oil Pressure – Low

15* Feedwater Line Differential Pressure – High

16a Suppression Pool Temperature – High, RPS Initiation

16b Suppression Pool Temperature – High, ESF Initiation

17 Condensate Storage Tank Level - Low

18 Suppression Pool Water Level - High

19 Main Steam Line Pressure – Low

20 Main Steam Line Flow – High

21 Condenser Vacuum – Low

22 Main Steam Tunnel Temperature – High

23 Main Turbine Area Temperature – High

24a Reactor Building Area Exhaust Air Radiation – High (During Core Alterations or operations with a potential for draining the reactor vessel; or during movement of irradiated fuel assemblies in the secondary containment.) (GTS Table 3.3.1.1-1 does not list SR 3.3.1.1.10 for this function in Modes 1, 2 and 3; see the discussion of **Issue 1** of **RAI 16-65** in the beginning of Section 16.4 of this SER. Also see the discussion of **RAI 16-28** later in this subsection.)

24b Fuel Handling Area Exhaust Air Radiation – High (During Core Alterations or operations with a potential for draining the reactor vessel; or during movement of irradiated fuel assemblies in the secondary containment.) GTS Table 3.3.1.1-1 does not list SR 3.3.1.1.10 for this function in Modes 1, 2 and 3; see the discussion of **Issue 1** of **RAI 16-65** in the beginning of Section 16.4 of this SER. Also see the discussion of **RAI 16-28** later in this subsection.)

25 RCIC Steam Line Flow – High

26 RCIC Steam Supply Line Pressure – Low

27 RCIC Equipment Area Temperature – High

28 RHR Area Temperature – High

29 CUW Differential Flow – High

30 CUW Regenerative Heat Exchanger Area Temperature – High

31 CUW non-regenerative Heat Exchanger Area Temperature – High

32 CUW Equipment Area Temperature – High

33 RCW/RSW Heat Exchanger Room Water Level – High (When RSW pumps are required to be OPERABLE or in operation.)

- Table 16.1 COL Item 21

The applicant completes PTS SR 3.3.1.1.10, Sensor Channel Calibration, for SSLC Functions 15a and 15b by omitting these functions from the PTS and bases, as justified by Departure STD DEP T1 2.3-1, which is described at the beginning of this subsection of the SER. Therefore, the applicant does not need to provide the site-specific allowable values for the instrumentation trip settings for these functions in the PTS. Based on the resolution of this departure, Table 16.1 COL Item 21 is resolved.

- Table 16.1 COL Item 22

The applicant completes PTS SR 3.3.1.1.11 for the following SSLC Functions by proposing to use "Option 3" of DC/COL-ISG-8 to revise GTS SR 3.3.1.1.11 in the COL application (Revision 4) to state, "Perform CHANNEL CALIBRATION in accordance with TS 5.5.2.11, 'Setpoint Control Program,'" and by establishing PTS 5.5.2.11.

3c Reactor Vessel Steam Dome Pressure – High, SLCS and FWRB Initiation

7c Reactor Vessel Water Level – Low, Level 2, SLCS and FWRB Initiation

PTS SR 3.3.1.1.11 is acceptable based on the resolution of **RAI 16-65 Issue 1**, which this SER describes at the beginning of Section 16.4, and in the evaluation of Departure STD DEP 16.3-100 in this subsection. However, Table 16.1 COL Item 22 remained unresolved pending completion of the review of the setpoint methodology and PTS 5.5.2.11.b, which was tracked in the SER with open items as part of **Open Item 16-1** (**RAI 16-65**). The staff finds that WCAP-17119-P is acceptable, as described in Section 7.1.4 of this report. In addition, the staff finds that the SCP is acceptable, as described in Section 16.4.15.6.11 of this report. Therefore, Table 16.1 COL Item 22 is resolved.

- Table 16.1 COL Item 23

The applicant completes the bases for PTS 3.3.1.1, Table 3.3.1.1-1, SSLC instrumentation Function 2b, "APRM Simulated Thermal Power – High, Flow Biased," by providing the correct site-specific value of 7 seconds for the thermal power time constant in Revision 3 of the COL application. This change resolves Table 16.1 COL Item 23.

- Table 16.1 COL Item 24

The applicant completes the bases for PTS 3.3.1.1, Table 3.3.1.1-1, SSLC instrumentation Function 17, "Condensate Storage Tank Level – Low," and Function 18, "Suppression Pool Water Level – High," by removing the brackets from the GTS bases Applicability condition for these functions. Functions 17 and 18 must "be OPERABLE in MODES 4 and 5 when HPCF is used to satisfy the requirement that at least 2 ECCS systems be OPERABLE with RPV Level less than 23 feet above the vessel flange." This change is acceptable because 7.0 meters (or 23 feet) is the site-specific, design-basis value. This change resolves Table 16.1 COL Item 24.

- Table 16.1 COL Item 25

The applicant completes the bases for PTS 3.3.1.1, Table 3.3.1.1-1 Function 22, "Main Steam Tunnel Temperature – High,' by removing the brackets from the sentence, "The Main Steam Tunnel Temperature – High Allowable Value is chosen to detect a leak equivalent to [95] L/min." Because 95 L/min is the correct value for the minimum main steam line leak rate in the main

steam tunnel to cause this temperature instrumentation function to trip, the value is acceptable. This change resolves Table 16.1 COL Item 25.

*Additional Requests for Information about PTS 3.3.1.1*

**RAI 16-28**. The staff requested the applicant to add SR 3.3.1.1.9, SR 3.3.1.1.10, and SR 3.3.1.1.14 to the SRs in PTS Table 3.3.1.1-1 for Functions 24a, "Reactor Building Area Exhaust Air Radiation-High," and 24b, "Fuel Handling Area Exhaust Air Radiation-High," for applicability conditions stated in footnote (f) "During CORE ALTERATIONS or operations with a potential for draining the reactor vessel," and footnote (g) "During movement of irradiated fuel assemblies in the secondary containment." GTS 3.3.1.1 Functions 24a and 24b for these applicability conditions require the following surveillances: SR 3.3.1.1.1, SR 3.3.1.1.5, SR 3.3.1.1.9, SR 3.3.1.1.10, and SR 3.3.1.1.14. The PTS omits SR 3.3.1.1.9, SR 3.3.1.1.10, and SR 3.3.1.1.14 for Functions 24a and 24b for these applicability conditions. Part 7 of the COL application contains no departure to justify omitting these SRs for these functions. The applicant's response dated August 18, 2009 (ML092320101), states that SR 3.3.1.1.9, SR 3.3.1.1.10 and SR 3.3.1.1.14 will be specified for Functions 24a and 24b for the applicability conditions specified in footnotes (f) and (g) in PTS Table 3.3.1.1-1. The staff found this response to be acceptable. The staff verified that Revision 4 of the COL application includes the stated changes. Therefore, **RAI 16-28** is resolved.

**RAI 16-29**. The staff requested the applicant to add SR 3.3.1.1.9 and SR 3.3.1.1.10 to the surveillance requirements in PTS Table 3.3.1.1-1 for Function 25, "RCIC, Steam Line Flow -High." GTS 3.3.1.1 Function 25, "RCIC, Steam Line Flow - High," requires the following surveillances: SR 3.3.1.1.1, SR 3.3.1.1.5, SR 3.3.1.1.9, and SR 3.3.1.1.10. The PTS omits SR 3.3.1.1.9 and SR 3.3.1.1.10 for Function 25. Part 7 of the COL application contains no departure to justify omitting SR 3.3.1.1.9 and SR 3.3.1.1.10 for this function. The applicant's response dated August 18, 2009, states that SR 3.3.1.1.9 and SR 3.3.1.1.10 will be specified for Function 25 in PTS Table 3.3.1.1-1. The staff found this response acceptable. The staff verified that Revision 4 of the COL application includes the stated changes. Therefore, **RAI 16-29** is resolved.

**RAI 16-30**. The staff requested the applicant to add SR 3.3.1.1.9 and SR 3.3.1.1.10 to the surveillance requirements in PTS Table 3.3.1.1-1 for Function 1a, "SRNM Neutron Flux – High," for the applicability condition of Mode 2. The GTS 3.3.1.1 specifies the following surveillances for Function 1a, Mode 2: SR 3.3.1.1.1, SR 3.3.1.1.3, SR 3.3.1.1.8, SR 3.3.1.1.9, and SR 3.3.1.1.10. The PTS omits SR 3.3.1.1.9 and SR 3.3.1.1.10 for Function 1a, Mode 2. Part 7 of the COL application contains no departure to justify omitting SR 3.3.1.1.9 and SR 3.3.1.1.10 for this function. The applicant's response dated August 18, 2009, states that SR 3.3.1.1.9 and SR 3.3.1.1.10 will be specified for Function 1a, Mode 2, in PTS Table 3.3.1.1-1. The staff found this response acceptable. The staff verified that Revision 4 of the COL application includes the stated changes. Therefore, **RAI 16-30** is resolved.

**RAI 16-31**. The staff requested the applicant to add SR 3.3.1.1.9 to the surveillance requirements in PTS Table 3.3.1.1 for Function 1d, "SRNM - Inop," with applicability of Mode 5, with any control rod withdrawn from a core cell containing one or more fuel assemblies, as stated in footnote (a). GTS 3.3.1.1 specifies SR 3.3.1.1.4 and SR 3.3.1.1.9 for Function 1d for this applicability condition. The PTS omits SR 3.3.1.1.9 for Function 1d for this applicability condition. Part 7 of the COL application contains no departure to justify omitting SR 3.3.1.1.9 for this function. The applicant's response dated August 18, 2009, states that SR 3.3.1.1.9 will be specified for Function 1d for the applicability condition of Mode 5, with any control rod

withdrawn from a core cell containing one or more fuel assemblies, in PTS Table 3.3.1.1-1. The staff found this response acceptable. The staff verified that Revision 4 of the COL application includes the stated changes. Therefore, **RAI 16-31** is resolved.

**RAI 16-34**. In this RAI, the staff identified three issues:

6. According to GTS and PTS Table 3.3.1.1-1, SR 3.3.1.1.4 applies only to SRNM Functions 1a, 1b & 1d, and only in Mode 5. The bases for GTS and PTS SR 3.3.1.1.4 mention the APRM - High Functions in the second paragraph. Since this reference does not belong in the discussion of SR 3.3.1.1.4, the staff requested the applicant to omit it from the PTS bases for SR 3.3.1.1.4 and address this correction in a new standard departure. The applicant's response dated August 18, 2009, proposes Departure STD DEP 16.3-99 to accomplish this change, and this issue is therefore resolved. The staff verified that Revision 4 of the COL application includes STD DEP 16.3-99.

7. The staff requested that the applicant correct the inconsistency between the bracketed 32-day Frequency of GTS and PTS SR 3.3.1.1.4 and the bracketed 31-day Frequency in the bases for GTS and PTS SR 3.3.1.1.4. The applicant's response dated August 18, 2009, changes the Frequency to 31 days and removes the brackets, and therefore resolves this issue. This change is in Revision 3 of the COL application.

8. The staff requested that the applicant justify the bracketed Frequency of 92 days for the DIVISIONAL FUNCTIONAL TEST, GTS and PTS SR 3.3.1.1.5, and CHANNEL FUNCTIONAL TEST, GTS and PTS SR 3.3.1.1.6, with NRC-approved topical reports, as prescribed by the reviewer's notes in the bases for Section 3.3 of NUREG-1434, STS for GE Plants BWR/6, Revision 3. The justification for the 92-day Frequency for the Channel Functional Test for the BWR/6 is based on NRC-approved topical reports. If the applicant cannot provide such a justification, the staff informed the applicant that the Frequency justification stated in the GTS is an acceptable basis for a 31-day Frequency for SR 3.3.1.1.5 and SR 3.3.1.1.6. The applicant's response dated August 18, 2009, states that a 31-day Frequency will be specified for these surveillances and the brackets will be removed. These changes resolve this issue. This SER also addresses this issue in the discussion of Table 16.1 COL Items 16 and 18 in this subsection, and in the discussion of the response to **RAI 16-21, Issue 4**, in the beginning of Section 16.4. The staff verified that Revision 4 of the COL application includes these changes.

Based on the above evaluations, **RAI 16-34** is resolved.

**RAI 16-35**. The staff requested the applicant to use the same units for leakage rates in the bases for PTS 3.3.1.1. The bases for Function 22, "Main Steam Tunnel Temperature – High," and Function 28, "RHR Area Temperature – High," state:

> The Allowable Values are set low enough to detect a leak equivalent to 95 L/min.

In contrast, the bases for Function 23, "Main Turbine Area Temperature – High," Function 27, "RCIC Equipment Area Temperature – High," Function 30, "CUW Regenerative Heat Exchanger Area Temperature – High," Function 31, "CUW non-regenerative Heat Exchanger Area Temperature – High," and Function 32, "CUW Equipment Area Temperature – High," state:

The Allowable Values are set low enough to detect a leak equivalent to $1.58 \times I0^{-3}$ $m^3/s$.

Since the value $1.58 \times I0^{-3}$ $m^3/s$ is equivalent to 95 L/min, the staff requested that the applicant make the bases consistent by using the same units. The applicant's response dated August 18, 2009, states that the bases discussion will change for Functions 23, 27, 30, 31, and 32 to use 95L/min. This change resolves **RAI 16-35**. The applicant's response also states that this editorial change will be addressed in a new departure covering editorial changes throughout the GTS and bases. The staff verified that STD DEP 16.3-97 includes this editorial change in the bases for PTS 3.3.1.1 and that this change has been incorporated into Revision 4 of the COL application.

**RAI 16-36**. The applicant's response to this RAI dated August 18, 2009, states that the following GTS bases text will be restored to the bases for PTS 3.3.1.1 Function 2c, "Average Power Range Monitor Fixed Neutron Flux-High," and Function 2f, "Oscillation Power Range Monitor (OPRM)":

Function 2c: "This Function's trip signal is sent to the TLFs over the same data transmission paths as those described for Function 2.a above and is subject to the same OPERABILITY conditions."

Function 2f: "There are four divisions of OPRMs, one in each NMS division. Each OPRM acquires data from LPRMs distributed throughout the core. Therefore, each OPRM is capable of detecting an oscillation in any core region. Each OPRM sends trip data to all four RPS TLFs via suitable isolators."

The staff verified that Revision 4 of the COL application includes the above information in the bases for PTS 3.3.1.1. This change resolves **RAI 16-36**.

Based on the above evaluation, PTS 3.3.1.1 and bases are acceptable

### 16.4.6.2 *3.3.1.2 Reactor Protection System and Main Steam Isolation Valve Actuation*

GTS 3.3.1.2 and bases are incorporated by reference into the PTS and bases with the following departures and COL items:

- STD DEP T1 3.4-1 — Safety-Related I&C Architecture [bases only]

See Chapter 7 and Subsection 16.4.6.1 of this SER for the evaluation of this departure.

- STD DEP 16.3-57 — LCO 3.3.1.2, Reactor Protection System and Main Steam Isolation Valve (MSIV) Actuation [bases only]

For the condition of one of two RPS manual scram channels inoperable, GTS 3.3.1.2 Required Action I.1 requires placing the affected division in trip in 1 hour, and Required Action I.2 requires restoring the required channel to an operable status within 30 days. The bases for these Actions contain the statement, "Note that the automatic actuation logic becomes 1/3 in this condition so there is an increased vulnerability to spurious trips." This departure omits this sentence from the bases for PTS 3.3.1.2 because it is incorrect; the automatic actuation logic is unaffected by placing the affected division in trip per Required Action I.1. This standard

departure corrects a technical error in the GTS bases description of the actuation logic design for Table 3.3.1.2-1 Function 3. This departure is acceptable because the associated action requirements are unaffected. Therefore, Departure STD DEP 16.3-57 is acceptable.

- STD DEP 16.3-81 LCO 3.3.1.2, RPS and MSIV Actuation

This departure clarifies GTS Table 3.3.1.2 regarding the Mode 5 applicability for Function 1a, "RPS Actuation LOGIC CHANNELs," by adding footnote (b), which states, "SRNM and APRM LOGIC CHANNELS are only required to be OPERABLE when the associated Functions in LCO 3.3.1.1 are required to be OPERABLE." The only neutron monitoring system (NMS) SSLC Sensor instrumentation functions that are required to be operable in Mode 5 by GTS 3.3.1.1 are:

1a SRNM Neutron Flux – High

1b SRNM Neutron Flux – Short Period

1d SRNM Inop

The footnote clarifies that the RPS Actuation LOGIC CHANNELs for the other SSLC Sensor instrumentation SRNM and APRM functions are not required to be operable in Mode 5. This clarification is consistent with the intent of the Mode 5 applicability for GTS 3.3.1.2 Function 1a. Therefore, footnote (b) is acceptable. This departure also removes the GTS Table 3.3.1.2-1 requirement for a Divisional Functional Test, SR 3.3.1.2.2, for function 1b, "RPS Actuation OUTPUT CHANNELs," and Function 2b, "MSIVs and MSL Drain Valves Actuation OUTPUT CHANNELs." This change is acceptable because the Divisional Functional Test surveillance requirement does not apply to output channels. This departure also makes appropriate changes to the bases for GTS 3.3.1.2. Therefore, Departure STD DEP 16.2-81 is acceptable.

- STD DEP 16.3-82 LCO 3.3.1.2, Reactor Protection System and Main Steam Isolation Valve (MSIV) Actuation [bases only]

This departure clarifies the "Actions" section of the bases for GTS 3.3.1.2 by changing the descriptions of Conditions B, F, J, K, and L as follows, with changes indicated by underlined and lined-out text:

Condition B Condition B occurs if two LOGIC CHANNELs <u>for the same Function</u> or MSIV manual channels become inoperable in a fashion that does not result in an Actuation…

Condition F Condition F occurs if two OUTPUT CHANNELs <u>for the same Function</u> become inoperable in a fashion that does not result in an Actuation…

Condition J This Condition assures that appropriate actions are taken for ~~multiple~~ <u>one or more</u> inoperable RPS Actuation Functions while in MODES 1 or 2…

Condition K This Condition assures that appropriate actions are taken for ~~multiple~~ <u>one or more</u> inoperable RPS Actuation Functions while in MODE 5 with any control rod withdrawn from a core cell containing at least one fuel assembly…

Condition L This Condition assures that appropriate actions are taken for ~~multiple~~ <u>one or more</u> inoperable MSIV Actuation Functions.

The change specifies and clarifies that (1) Condition B or F occurs if two logic channels or two output channels "for the same Function" become inoperable; (2) Conditions J and K assure that appropriate actions are taken for "one or more" inoperable RPS Actuation Functions; and (3) Condition L assures appropriate actions are taken for "one or more" inoperable MSIV Actuation Functions. Because these changes only make the bases consistent with the intent and literal meaning of Conditions B, F, J, K, and L for GTS 3.3.1.2, Departure STD DEP 16.3-82 is acceptable.

- 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 [bases only]

See Subsection 16.4.6.1 of this SER for the evaluation of this departure.

- Table 16.1 COL Item 26

The applicant completes PTS SR 3.3.1.2.1, "Perform CHANNEL FUNCTIONAL TEST," for the RPS manual scram actuation function, by removing the brackets from the 7-day Frequency. This change is acceptable and resolves Table 16.1 COL Item 26.

- Table 16.1 COL Item 27

The applicant completes PTS SR 3.3.1.2.2 and bases by specifying a 31-day Frequency for the DIVISIONAL FUNCTIONAL TEST. This change is acceptable as this SER describes in the discussion of the response to **RAI 16-21 Issue 4**, in the beginning of Section 16.4. Therefore, this change resolves Table 16.1 COL Item 27. The staff verified that Revision 4 of the COL application includes this change.

- Table 16.1 COL Item 28

The applicant completes PTS SR 3.3.1.2.3 and bases by specifying a 31-day Frequency for the CHANNEL FUNCTIONAL TEST. This change is acceptable as this SER describes in the discussion of the response to **RAI 16-21 Issue 4**, in the beginning of Section 16.4. Therefore, this change resolves Table 16.1 COL Item 28. The staff verified that Revision 4 of the COL application includes this change.

Based on the above evaluation, PTS 3.3.1.2 and bases are acceptable.

### 16.4.6.3 *3.3.1.3 Standby Liquid Control and Feedwater Runback Actuation*

GTS 3.3.1.3 and bases are incorporated by reference into the PTS and bases with the following departure and one COL item:

- STD DEP 16.3-83 — LCO 3.3.1.3, Standby Liquid Control and Feedwater Runback (FWRB) Actuation [bases only]

This departure changes the discussion of the Manual ATWS-ARI/SLCS Initiation logic in the bases of GTS 3.3.1.3 to describe the actual plant design. The applicant states that this Manual ATWS-ARI/SLCS discussion is illustrated in ABWR DCD Figures 15E-1a and 15E-1b. The Manual ATWS-ARI/SLCS Initiation originates at the Manual ATWS A and Manual ATWS B

pushbuttons shown in DCD Figure 15E-1a. Each pushbutton represents a manual initiation channel with input from both switches required to satisfy the manual actuation logic. The staff verified that the revised description of the Manual ATWS-ARI/SLCS Initiation logic in the bases for PTS 3.3.1.3 accurately reflects the design of the ABWR and STP Units 3 and 4. Therefore, Departure STD DEP 16.3-83 is acceptable.

- Table 16.1 COL Item 29

The applicant completes PTS SR 3.3.1.3.1 and bases by specifying a 31-day Frequency for the DIVISIONAL FUNCTIONAL TEST. This change is acceptable as this SER describes in the discussion of the response to **RAI 16-21 Issue 4**, in the beginning of Section 16.4. Therefore, this change resolves Table 16.1 COL Item 29. The staff verified that Revision 4 of the COL application includes this change.

Based on the above evaluation, PTS 3.3.1.3 and bases are acceptable.

#### 16.4.6.4 *3.3.1.4 ESF Actuation Instrumentation*

GTS 3.3.1.4 and bases are incorporated by reference into the PTS and bases with the following departures and COL items:

- STD DEP T1 2.4-2 Feedwater Line Break Mitigation

See the discussion of this departure in Subsection 16.4.6.1.

- STD DEP T1 2.4-3 RCIC Turbine/Pump

See the discussion of this departure in Subsection 16.4.6.1.

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

See Chapter 7 and Subsection 16.4.6.1 of this SER for the evaluation of this departure.

- STD DEP 7.3-17 Automatic Depressurization System Electrical Interface (bases only)

This departure revises the “Background” section of the bases for GTS 3.3.1.4 to show that there are three divisions of ESF logic (Divisions I, II, and III), not four. The staff verified that the revised bases accurately reflect the design of STP Units 3 and 4, as described in FSAR Subsection 7.3.2.1.2(3e), and do not change the intent of LCO 3.3.1.4. Therefore, Departure STD DEP 7.3-17 changes to the PTS 3.3.1.4 bases are acceptable. See Chapter 7 of this SER for the evaluation of other DCD changes associated with this departure.

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

See the evaluation of this departure in Subsection 16.4.11.1.

- STD DEP 16.3-50 LCO 3.3.1.4, ESF Actuation Instrumentation

This departure changes the applicable modes or other specified conditions to include Mode 1 for the following shutdown (SD) cooling system isolation actuation functions in GTS Table 3.3.1.4-1:

14.a, “SD Cooling System Isolation Initiation”

14.b, “SD Cooling Isolation Device Actuation”

This change is consistent with the applicable modes or other specified conditions for the following reactor vessel steam dome pressure – high instrumentation sensor function in GTS Table 3.3.1.1-1, which is also applicable in Mode 1:

3.b, “Isolation Initiation”

This change is appropriate because an actuation function should be operable when the supporting sensor functions are required to be operable. Therefore, STD DEP 16.3-50 is acceptable.

- STD DEP 16.3-86 LCO 3.3.1.4, ESF Actuation Instrumentation

The applicant proposes to revise GTS SR 3.3.1.4.7 from "Perform Manual initiation CHANNEL FUNCTIONAL TEST" to "Perform CHANNEL FUNCTIONAL TEST," and Footnote (d) of GTS Table 3.3.1.4-1 from "These are manual initiation channel functions" to "These are manual channel functions." This departure addresses the apparent inconsistency of using the word "initiation" in the SR and Footnote while applying the SR and Footnote to ESF Actuation Function 4.f, “ATWS Manual ADS Inhibit of ADS,” which uses the word "inhibit." Because a CFT is specified regardless of the inclusion of the word "initiation," the intent of the GTS is not changed. Therefore, this departure is administrative and acceptable. The staff issued **RAI 16-56** requesting the applicant to clarify in the departure why the intent of GTS 3.3.1.4 is not changed. The applicant’s response dated September 24, 2009 (ML092710290), states that the discussion of Departure STD DEP 16.3-86 will be revised to more clearly explain that the clarification does not change the intent of GTS SR 3.3.1.4.7. The staff reviewed the markup of the discussion of this departure and found the changes appropriate. The staff verified that Section 2.2.3 of Part 7 of Revision 4 of the COL application incorporates in Departure STD DEP 16.3-86 the changes proposed in the applicant's response to **RAI 16-56**. Therefore, Departure STD DEP 16.3-86 is acceptable and **RAI 16-56** is resolved.

- STD DEP 16.3-87 LCO 3.3.1.4, ESF Actuation Instrumentation [bases only]

This departure corrects the discussion of Required Action G.1 in the “Actions” section of the bases for GTS 3.3.1.4 to match Condition G in GTS 3.3.1.4, which states, “Required Action and associated Completion Time not met for Condition B, C, D, E, or F.” Specifically, Condition A is removed from the list of referenced action conditions in the initial sentence of the bases for Action G.1. This editorial correction does not change the intent of Condition G, and TS bases should be consistent with the associated TS requirements. Therefore, Departure STD DEP 16.3-87 is acceptable.

- STD DEP 16.3-94 LCO 3.3.1.4, ESF Actuation Instrumentation

This departure changes the applicable modes or other specified conditions for reactor water cleanup (CUW) isolation actuation Function 13c, "CUW Isolation on SLC Initiation," in GTS Table 3.3.1.4-1 from "Modes 1, 2, and 3" to only "Modes 1 and 2," because the reactor is not critical in Mode 3, and LCO 3.1.7 only requires the SLC system to be operable in Modes 1 and 2; CUW isolation is not needed to support the SLC system in Mode 3. This change is also consistent with reactor water cleanup (RWCU) system isolation Function 4.l, "SLC System Initiation," in STS Table 3.3.6.1-1, "Primary Containment Isolation Instrumentation," which is required to be operable only in Modes 1 and 2. Therefore, Departure STD DEP 16.3-94 is acceptable.

- STD DEP 16.3-99 Bases Allowable Value Misstatements [bases only]

See Subsection 16.4.6.1 for the evaluation of this departure.

- STD DEP 16.3-100 Section 3.3, Setpoint Control Program Implementation

The applicant proposes Departure STD DEP 16.3-100 in response to **RAI 16-65 Issue 1**. The departure omits the "allowable value" column of GTS Table 3.3.1.4-1 from PTS Table 3.3.1.4-1 as part of implementing "Option 3" of DC/COL-ISG-8 for limiting safety system settings. The departure also revises the following GTS SRs so that PTS 3.3.1.4 requires performing these SRs in accordance with TS 5.5.2.11, "Setpoint Control Program":

- SR 3.3.1.4.3, Division Functional Test; and
- SR 3.3.1.4.6, Sensor Channel Calibration.

The changes to GTS 3.3.1.4 are acceptable based on the NRC staff's conclusion that the applicant's response to **RAI 16-65 Issue 1** is acceptable. Therefore, the parts of Departure STD DEP 16.3-100 that change GTS 3.3.1.4 are acceptable. The changes to GTS 3.3.1.4 also complete Table 16.1 COL Item 31, as described later in this subsection. The staff verified that Revision 4 of the COL application, Parts 2, 4, and 7 includes this departure. Section 16.2 of this SER lists the subsections of this SER that address the changes to the GTS and bases that are within the scope of the departure. The beginning part of Section 16.4 of this SER describes all of the changes to the GTS and bases that are within the scope of the departure.

- Table 16.1 COL Item 30

The applicant completes GTS SR 3.3.1.4.3 and bases by specifying a 31-day Frequency for the DIVISION FUNCTIONAL TEST. The SR applies to ESF Actuation Instrumentation as listed in PTS Table 3.3.1.4-1, Functions 1a, 1b, 1c, 1e, 2a, 2b, 2c, 2d, 2f, 2g, 3a, 3b, 3c, 3e, 4a, 4c, 4d, 4e, 4f, 5a, 5b, 5c, 5e, 6a, 7a, 7c, 7d, 7e, 8a, 9a, 9c, 10a, 10c, 10d, 10e, 10g, 11, 12a, 12c, 12d, 13a, 14a, and 15a. The 31-day Frequency is acceptable as this SER describes in the discussion of the response to **RAI 16-21 Issue 4**, in the beginning of Section 16.4. These changes resolve Table 16.1 COL Item 30. The staff verified that Revision 4 of the COL application includes these changes.

- Table 16.1 COL Item 31

The applicant completes PTS SR 3.3.1.4.6 using "Option 3" of DC/COL-ISG-8 by proposing to revise GTS SR 3.3.1.4.6 in the COL application (Revision 4) to state, "Perform CHANNEL CALIBRATION in accordance with TS 5.5.2.11, Setpoint Control Program," and by establishing PTS 5.5.2.11. PTS SR 3.3.1.4.6 is acceptable based on the resolution of **RAI 16-65 Issue 1**, which this SER describes at the beginning of Section 16.4. However, Table 16.1 COL Item 31 remained unresolved pending completion of the review of the setpoint methodology and PTS 5.5.2.11.b, which was tracked in the SER with open items as a part of **Open item 16-1** (**RAI 16-65**). The staff finds that WCAP-17119-P is acceptable, as described in Section 7.1.4 of this report. In addition, the staff finds that the SCP is acceptable, as described in Section 16.4.15.6.11 of this report. Therefore, Table 16.1 COL Item 31 is resolved.

Based on the above evaluation, PTS 3.3.1.4 and bases are acceptable.

### 16.4.6.5 *3.3.2.1 Startup Range Monitor (SRNM) Instrumentation*

GTS 3.3.2.1 and bases are incorporated by reference into the PTS and bases with no departures and the following COL items:

- Table 16.1 COL Item 32

The applicant completes the bases for Required Action E.1 of PTS 3.3.2.1 by removing the brackets from "[7]" in the last sentence, which states, "Required Action E.2 modifies Required Action D.3 to require immediate initiation of action to restore one of the inoperable required SRNMs to OPERABLE status instead of requiring initiation of action within the former Completion Time of [7] days." This change is acceptable because the unbracketed Completion Time for GTS 3.3.2.1 Required Action D.3 is 7 days. Therefore, the bases for PTS 3.3.2.1 Required Action E.1 is acceptable.

- Table 16.1 COL Item 33

The applicant completes the bases for PTS SR 3.3.2.1.1, "Perform Channel Check," by removing the brackets from the Frequency of "[12] hours" in the third paragraph, which states, "The specified high reliability of each SRNM channel provides confidence that a channel failure will be rare. However, a surveillance interval of [12] hours is used to provide confidence that gross failures that do not activate an annunciator or alarm will be detected within the specified Frequency." This change is acceptable because the unbracketed Frequency of GTS SR 3.3.2.1.1 is 12 hours. Therefore, the bases for PTS SR 3.3.2.1.1 are acceptable and Table 16.1 COL Item 33 is resolved.

- Table 16.1 COL Item 34

The applicant completes PTS SR 3.3.2.1.4, "Perform Channel Functional Test," and bases by removing the brackets from the Frequency of "[7] days." This SR applies to GTS Table 3.3.2.1-1 Function 1, "SRNM," in Mode 5. The 7-day Frequency in Mode 5 is consistent with the STS and is acceptable. Therefore, PTS SR 3.3.2.1.4 and bases are acceptable, and Table 16.1 COL Item 34 is resolved.

- Table 16.1 COL Item 35

The applicant completes PTS SR 3.3.2.1.5, "Perform Channel Functional Test," and bases by removing the brackets from the Frequency of "[31] days." This SR applies to GTS Table 3.3.2.1-1 Function 1, "SRNM," in Modes 2, 3, and 4. The 31-day Frequency in Modes 2, 3, and 4 is consistent with the STS and is acceptable. Therefore, PTS SR 3.3.2.1.5 and bases are acceptable, and Table 16.1 COL Item 35 is resolved.

Based upon the above evaluation, PTS 3.3.2.1 and bases are acceptable.

### 16.4.6.6 *3.3.3.1 Essential Communication Function (ECF)*

GTS 3.3.3.1 and bases are incorporated by reference into the PTS and bases with the following departures and COL items:

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

See Chapter 7 and Subsection 16.4.6.1 of this SER for the evaluation of this departure.

- Table 16.1 COL Item 36

The applicant completes PTS 3.3.3.1 Required Action B.1, as modified by Departure STD DEP T1 3.4-1 (EMS was replaced by EC), by removing the brackets from the Completion Time of "[30]-days." This action states, "Restore all data transmission segments in at least three ECF divisions to OPERABLE status." In Condition B, complete data transmission paths are maintained in all divisions ensuring functional capability of the supported instrumentation systems is maintained because a single failure can cause only one division to be lost due to the failure of data transmission. A Completion Time of 30 days is a reasonable time period to repair any degradation in data transmission redundancy in more than one ECF division. The bases state, "The Completion Time is based on the specified high reliability of the individual data transmission segments and the limited number of devices involved in each segment." Therefore, PTS 3.3.3.1 Required Action B.1 and bases are acceptable, and Table 16.1 COL Item 36 is resolved.

- Table 16.1 COL Item 37

The applicant completes PTS SR 3.3.3.1.1 and bases by replacing the bracketed Frequency of "[92] days" with "31 days." This SR requires verification that "the required data transmission path segments are OPERABLE." The proposed 31-day Frequency is acceptable based on the specified high reliability of the individual data transmission segments. This change is also acceptable as this SER describes in the discussion of the response to **RAI 16-21 Issue 4**, in the beginning of Section 16.4. Therefore, PTS SR 3.3.3.1.1 and bases are acceptable, and Table 16.1 COL Item 37 is resolved. The staff verified that Revision 4 of the COL application includes these changes.

Based on the above evaluation, PTS 3.3.3.1 and bases are acceptable.

### 16.4.6.7 *3.3.4.1 ATWS and End-of-Cycle Recirculation Pump Trip Instrumentation*

GTS 3.3.4.1 and bases are incorporated by reference into the PTS and bases with the following departures and COL items:

- STD DEP T1 3.4-1 Safety-Related I&C Architecture [bases only]

See Chapter 7 and Subsection 16.4.6.1 of this SER for the evaluation of this departure.

- 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 [bases only]

This departure corrects the second sentence of the first paragraph of the bases for GTS SR 3.3.4.1.5, "verify the RECIRCULATION PUMP TRIP (RPT) SYSTEM RESPONSE TIME is within limits," by replacing "EOC-RPT System Response Time" with "RPT System Response Time," in order to match the SR statement and because GTS Section 1.1, "Definitions," only specifies an "RPT System Response Time," not an "EOC-RPT System Response Time." This SR applies to the following ATWS and EOC-RPT Instrumentation Functions listed in GTS Table 3.3.4.1-1:

1. "Feedwater Reactor Vessel Water Level - Low, Level 3"
2. "Reactor Water Vessel Level - Low, Level 2"
3. "SB&PC Reactor Steam Dome Pressure – High"
4. "EOC-RPT Initiation"

Because this departure is only an editorial correction to make the bases consistent with the GTS, Departure STD DEP 16.3-55 is acceptable.

- STD DEP 16.3-99 Bases Allowable Value Misstatements [bases only]

See Subsection 16.4.6.1 for the evaluation of this departure.

- STD DEP 16.3-100 Setpoint Control Program Implementation

The applicant proposes Departure STD DEP 16.3-100 in response to **RAI 16-65 Issue 1**. The departure omits the "allowable value" column of GTS Table 3.3.4.1-1 from PTS Table 3.3.4.1-1 as part of implementing "Option 3" of DC/COL-ISG-8 for limiting safety system settings. The departure also revises the following GTS SRs so that PTS 3.3.4.1 requires performing these SRs in accordance with TS 5.5.2.11, "Setpoint Control Program":

- SR 3.3.4.1.2, Channel Functional Test; and
- SR 3.3.4.1.3, Sensor Channel Calibration.

The departure also makes appropriate changes to the "ASA, LCO, and Applicability" sections of the bases for GTS 3.3.1.4. The changes to GTS 3.3.4.1 and bases are acceptable based on the NRC staff's conclusion that the applicant's response to **RAI 16-65 Issue 1** is acceptable. The changes to GTS 3.3.4.1 also complete Table 16.1 COL Item 42, as described later in this subsection. The staff verified that Revision 4 of the COL application, Parts 2, 4, and 7 includes this departure. Section 16.2 of this SER lists the subsections of this SER that address the changes to the GTS and bases that are within the scope of the departure. The beginning part of Section 16.4 of this SER describes all of the changes to the GTS and bases that are within the scope of the departure.

- Table 16.1 COL Item 38

The applicant finalizes PTS 3.3.4.1 Required Action E.1, “Restore at least one inoperable channel to OPERABLE status,” for the condition of “one or more Functions with three or more channels inoperable,” by removing the brackets from the Completion Time of “[24] hours.” This action applies to the following ATWS and EOC-RPT Instrumentation four-channel Functions listed in GTS Table 3.3.4.1-1:

2. “Reactor Vessel Water Level - Low, Level 2”
4. “EOC-RPT Initiation”
9. “RPS Scram Follow Signal”

Because these functions utilize two-out-of-four logic, Condition E represents a loss-of-function condition. The GTS bases state, “the 24 hour Completion Time to restore one of the inoperable channels is sufficient for the operator to take corrective action and takes into account the low likelihood of an event requiring actuation of the ATWS or EOC-RPT instrumentation during this period.” Because the staff found the GTS bases justification for the 24-hour Completion Time acceptable in the ABWR design certification, as indicated by the absence of brackets, the 24-hour Completion Time for PTS 3.3.4.1 Required Action E.1 is acceptable. Therefore, Table 16.1 COL Item 38 is resolved.

- Table 16.1 COL Item 39

The applicant finalizes PTS 3.3.4.1 Required Action F.1, “Apply the MCPR limit for inoperable EOC-RPT as specified in the COLR,” and Required Action F.2, “Reduce power to < 40% RTP,” and associated bases by removing the brackets from the Completion Time of “[2] hours.” These actions apply to ATWS and EOC-RPT Instrumentation Function 4, “EOC-RPT Initiation (Turbine Steam Flow Rapid Shutoff EOC-RPT),” listed in GTS Table 3.3.4.1-1, for the condition of Required Action and associated Completion Time of Condition C (one of four channels inoperable), Condition D (two of four channels inoperable), or Condition E (three of four channels inoperable) not met. The bases state:

> The [2] hour Completion Time to implement the Required Actions is sufficient for the operator to determine which action is appropriate and to take corrective action, and takes into account the specified high reliability of the devices used to implement the EOC-RPT and the low likelihood of an event requiring actuation of the EOC-RPT instrumentation during this period.

Applying the MCPR limit for an inoperable EOC-RPT restores the MCPR margin to within limits assumed in the safety analysis; or alternatively, reducing thermal power below the level at which the EOC-RPT initiation Function is required ensures that the unit is operating in a safe condition. Two hours to accomplish these actions is reasonable; the alternative to these actions would be to commence a unit shutdown, and that would not reduce the time needed to bring the unit to a safe condition in a controlled and orderly manner. Therefore, the 2-hour Completion Time for PTS 3.3.4.1 Required Action F.1 and F.2 is acceptable. Therefore, Table 16.1 COL Item 39 is resolved.

- Table 16.1 COL Item 40

The applicant finalizes PTS 3.3.4.1 Required Action G.1, "Restore channels to OPERABLE status," and associated bases by removing the brackets from the Completion Time of "[24] hours." These actions apply to ATWS and EOC-RPT Instrumentation two-channel Functions listed in PTS Table 3.3.4.1-1 for the condition of "One or more Functions with one or more channels inoperable." These Functions are:

| ATWS and EOC-RPT Function | Required Channels |
|---|---|
| 6. ASD Pump Trip Actuation. | 1 per ASD |
| 7. ASD Pump Trip Timers. | 1 per ASD |
| 8. ASD Pump Trip Load Interruption. | 1 per ASD |
| 10. Manual ATWS-ARI/SLCS Initiation. | 2 |
| 12. ATWS-FMCRD Initiation Function of the RCIS. | 2 |
| 13. FMCRD Insertion Confirmatory Logic. | 1 |
| 15. FMCRD Emergency Insertion Invertor Control Logic. | 1 per rod |
| 16. Recirculation Runback. | 1 per pump |

Condition G always represents a loss-of-function condition for Functions 6, 7, 8, 13, 15, and 16 and can represent a loss-of-function condition for Functions 8 and 10. The bases for GTS 3.3.4.1 Required Action G.1 justify the bracketed Completion Time to restore a channel to operable status by stating,

> This required Action assures that appropriate compensatory measures are taken for inoperable channels in Functions with one or two channels. Because of the low probability of an event requiring these Functions, [24] hours is provided to restore the inoperable functions.

Because the staff found in the ABWR design certification that the GTS bases justification for the 24-hour Completion Time of Required Action E.1 (also for a loss-of-function condition) is acceptable, the 24-hour Completion Time for PTS 3.3.4.1 Required Action G.1 is also acceptable. Therefore, PTS 3.3.4.1 Required Action G.1 and bases are acceptable, and Table 16.1 COL Item 40 is resolved.

- Table 16.1 COL Item 41

The applicant completes PTS SR 3.3.4.1.2 and bases by replacing the bracketed Frequency of "[92] days" with "31 days." This SR requires performing a Channel Functional Test for the following ATWS and EOC-RPT instrumentation Functions listed in Table 3.3.4.1-1.

1. "Feedwater Reactor Vessel Water Level - Low, Level 3"
2. "Reactor Water Vessel Level - Low, Level 2"
3. "SB&PC Reactor Steam Dome Pressure – High"
4. "EOC-RPT Initiation"
5. "RPT Trip Initiation Function of the RFC"
9. "RPS Scram Follow Signal"

The bases for PTS SR 3.3.4.1.2 state that the proposed 31-day Frequency is based on the specified high reliability and redundancy of the devices used to implement the Functions. This is acceptable as this SER describes in the discussion of the response to **RAI 16-21 Issue 4**, in the beginning of Section 16.4. Therefore, PTS SR 3.3.4.1.2 and bases are acceptable, and Table 16.1 COL Item 41 is resolved. The staff verified that Revision 4 of the COL application includes these changes.

- Table 16.1 COL Item 42

The applicant completes PTS SR 3.3.4.1.3 using "Option 3" of DC/COL-ISG-8 by proposing to revise GTS SR 3.3.4.1.3 in the COL application Revision 4 to state, "Perform CHANNEL CALIBRATION in accordance with TS 5.5.2.11, 'Setpoint Control Program,'" and by establishing PTS 5.5.2.11. The revised SR applies to the following ATWS and EOC-RPT instrumentation Functions listed in Table 3.3.4.1-1.

1. "Feedwater Reactor Vessel Water Level - Low, Level 3"
2. "Reactor Water Vessel Level - Low, Level 2"
3. "SB&PC Reactor Steam Dome Pressure – High"

PTS SR 3.3.4.1.3 is acceptable based on the resolution of **RAI 16-65 Issue 1**, which this SER describes at the beginning of Section 16.4. However, Table 16.1 COL Item 42 for Functions 1, 2, and 3 remained unresolved pending completion of the review of the setpoint methodology and PTS 5.5.2.11.b, which was tracked in the SER with open items as part of **Open Item 16-1** (**RAI 16-65**). The staff finds that WCAP-17119-P is acceptable, as described in Section 7.1.4 of this report. In addition, the staff finds that the SCP is acceptable, as described in Section 16.4.15.6.11 of this report. Therefore, Table 16.1 COL Item 42 is resolved for Functions 1, 2, and 3.

The applicant completes PTS SR 3.3.4.1.3 for Function 7, "ASD Pump Trip Timers," by replacing "≤ [ ] seconds for reactor internal pumps (RIPs) [A, D, F, J, B, E, & H] and < [ ] seconds for RIPs [C, G, & K]" in GTS Table 3.3.4.1-1 Footnote (a). This footnote specifies "≤ 0 seconds for RIPs A, D, F, J, B, E, & H and < 6 seconds for RIPs C, G, & K" in the PTS. The applicant's response to **RAI 16-21** states that the RIP designations (A through H, J, and K) are the correct site-specific designations, and the values of "0 seconds" and "6 seconds" are the correct analytically assumed plant-specific adjustable speed drive (ASD) pump timer values. On this basis, PTS Table 3.3.4.1-1 Footnote (a) for Function 7, "ASD Pump Trip Timers," for SR 3.3.4.1.3 is acceptable. Therefore, Table 16.1 COL Item 42 for Function 7 is resolved.

- Table 16.1 COL Item 43

The applicant completes the bases for PTS SR 3.3.4.1.7, "Perform CHANNEL FUNCTIONAL TEST," for Table 3.3.4.1-1 Function 10, "Manual Anticipated Transient Without Scram Alternate Rod Insert (ATWS-ARI)/SLCS Initiation," by removing the brackets from the Frequency of "[7] days." Specifically, the affected sentence in the GTS bases states, "However, a relatively short surveillance interval of [7] days is used since availability of manual ATWS-ARI is important for providing a diverse means of inserting all of the control rods and the logic is 2/2. This change is acceptable because it matches the specified unbracketed Frequency of GTS SR 3.3.4.1.7. Therefore, the bases for PTS SR 3.3.4.1.7 are acceptable, and Table 16.1 COL Item 43 is resolved.

Based on the above evaluation, PTS 3.3.4.1 and bases are acceptable.

### 16.4.6.8 *3.3.4.2 Feedwater and Main Turbine Trip Instrumentation*

GTS 3.3.4.2 and bases are incorporated by reference into the PTS and bases with the following departures and COL items. One proposed departure was withdrawn.

- STP DEP 10.4-5 Condensate and Feedwater System (bases only)

STPNOC proposes design changes to the condensate and feedwater system affecting Tier 2 information in the ABWR DCD. These changes include the increase in the number of feedwater pumps per unit from two to four. This increase requires changing the "Background" section of the bases for GTS 3.3.4.2 to state that there are four adjustable speed drives (ASDs), one for each feedwater pump. This change is acceptable because it makes the PTS 3.3.4.2 bases consistent with the proposed design for STP Units 3 and 4 feedwater systems. This change resolves Departure STD DEP 10.4-5 for its effect on the GTS bases. Subsections 10.4.7 and 11.3.4 of this SER address changes to FSAR Chapters 10 and 11 necessitated by this departure.

- STD DEP 16.3-39 (withdrawn) LCO 3.3.4.2, Feedwater and Main Turbine Trip Instrumentation

The applicant had proposed to modify the LCO, action and surveillance requirements, and the bases instrumentation description for GTS 3.3.4.2, "Feedwater and Main Turbine Trip Instrumentation." The applicant had deemed the changes appropriate because the three feedwater pump and main turbine trip instrumentation channels consist of three instrumentation channels and three digital controllers. The staff issued **RAI 16-39** requesting the applicant to justify several of the changes proposed in this departure. The applicant's response, however, dated August 26, 2009 (ML092430075), withdrew Departure STD DEP 16.3-39 and all associated changes to GTS 3.3.4.2 and bases. This action resolves Departure STD DEP 16.3-39. The staff verified that PTS 3.3.4.2 and bases of Revision 4 of the COL application incorporate by reference GTS 3.3.4.2 and bases. Based on the withdrawal of this departure, **RAI 16-39** is also resolved.

In Revision 0 of the COL application, PTS 3.3.4.2 contained operability and action requirements for "termination modules." The associated "Actions" section of the bases for PTS 3.3.4.2 indicated that with one or more of these termination modules inoperable, the feedwater and main turbine trip instrumentation could not perform its design function (feedwater and main turbine trip capability is not maintained). The staff issued **RAI 16-38** to ask why the applicant had withdrawn requirements for "termination modules" from Revision 2 of the COL application. The applicant's response to this RAI dated August 26, 2009, states that the current design of STP Units 3 and 4 does not have "termination modules." This statement resolves **RAI 16-38**.

- STD DEP 16.3-99 Bases Allowable Value Misstatements [bases only]

See Subsection 16.4.6.1 for the evaluation of this departure.

- STD DEP 16.3-100 Setpoint Control Program Implementation

The applicant proposes Departure STD DEP 16.3-100 in response to **RAI 16-65 Issue 1**. The departure omits the "allowable value" in SR 3.3.4.2.3 from PTS SR 3.3.4.2.3 as part of

implementing “Option 3” of DC/COL-ISG-8 for limiting safety system settings. The departure also revises the following GTS SRs so that PTS 3.3.4.2 requires performing these SRs in accordance with TS 5.5.2.11, “Setpoint Control Program”:

- SR 3.3.4.2.2, Channel Functional Test; and
- SR 3.3.4.2.3, Channel Calibration.

The changes to GTS 3.3.4.2 are acceptable based on the NRC staff’s conclusion that the applicant’s response to **RAI 16-65 Issue 1** is acceptable. The changes to GTS 3.3.4.2 also complete Table 16.1 COL Item 45, as described later in this subsection. The staff verified that Revision 4 of the COL application, Parts 2, 4, and 7 includes this departure. Section 16.2 of this SER lists the subsections of this SER that address the changes to the GTS and bases that are within the scope of the departure. The beginning part of Section 16.4 of this SER describes all of the changes to the GTS and bases that are within the scope of the departure.

- STD DEP 16.3-104 — SR 3.3.4.2.2 – CHANNEL FUNCTIONAL TEST – Feedwater Pump and Main Turbine Trip Instrumentation (bases only)

The applicant modified the rationale for the SR frequency in the bases for PTS SR 3.3.4.2.2 in response to **RAI 16-68** dated January 13, 2010 (ML100141738), as discussed in the evaluation of **RAI 16-21 Issue 4**, in Subsection 16.4 of this SER, and as stated below in the evaluation of Table 16.1 COL Item 44. Based on the resolution of these items, STD DEP 16.3-104 is acceptable. The staff verified that this departure and bases change is included in Revision 4 of the COL application. Verification that the markup of the bases for SR 3.3.4.2.2 in Chapter 16 of Part 2 of a future revision of the COL application is annotated to indicate that Departure STD DEP 16.3-104 justifies the change to the bases for SR 3.3.4.2.2 is being tracked as **Confirmatory Item 16.21.4**.

- Table 16.1 COL Item 44

The applicant completes PTS SR 3.3.4.2.2 and bases by replacing the bracketed Frequency of “[92] days” with “31 days.” This change is acceptable as discussed in the response to **RAI 16-21 Issue 4**, as described in the beginning of Section 16.4 of this SER. Therefore, Table 16.1 COL Item 44 is resolved. The staff verified that Revision 4 of the COL application includes these changes.

PTS SR 3.3.4.2.2 requires performing a Channel Functional Test for Feedwater Pump and Main Turbine Trip Instrumentation. The bases for PTS SR 3.3.4.2.2 state that the [92]-day Frequency is based on “the system capability to automatically perform self-tests and diagnostics.” Without regard for this, the staff considers the 31-day Frequency to be acceptable based on the specified high reliability and redundancy of the devices used to implement the feedwater pump and main turbine trip sensor (reactor vessel level high – Level 8) and actuation functions of the three required channels. The applicant’s response to **RAI 16-68** dated January 13, 2010, proposes to replace the rationale for the SR frequency in the bases for GTS SR 3.3.4.2.2, so that the bases for PTS SR 3.3.4.2.2 state the following:

> The Frequency of 31 days is based on the specified high reliability, redundancy and low drift of the devices used to implement the Feedwater Pump and Main Turbine Trip Function. In addition, the self-test features of the Feedwater Pump

and Main Turbine Trip Instrumentation provide confidence that most failures that occur between surveillances will be automatically detected.

This change is acceptable as this SER describes in the discussion of the response to **RAI 16-21 Issue 4**, Section 16.4, and in the evaluation of Departure STD DEP 16.3-104 in this subsection. The staff verified that Revision 4 of the COL application includes Departure STD DEP 16.3-104 and this bases change.

- Table 16.1 COL Item 45

The applicant completes PTS SR 3.3.4.2.3 using "Option 3" of DC/COL-ISG-8 by proposing to revise GTS SR 3.3.4.2.3 in the COL application (Revision 4) so that PTS SR 3.3.4.2.3 states, "Perform CHANNEL CALIBRATION in accordance with TS 5.5.2.11, 'Setpoint Control Program,'" and establishing PTS 5.5.2.11.

PTS SR 3.3.4.2.3 is acceptable based on the resolution of **RAI 16-65 Issue 1**, which this SER describes at the beginning of Section 16.4. However, Table 16.1 COL Item 45 remained unresolved pending completion of the review of the setpoint methodology and PTS 5.5.2.11.b, which was tracked in the SER with open items as part of **Open item 16-1** (**RAI 16-65**). The staff finds that WCAP-17119-P, Revision 2, is acceptable, as described in Section 7.1.4 of this report. In addition, the staff finds that the SCP is acceptable, as described in Section 16.4.15.6.11 of this report. Therefore, Table 16.1 COL Item 45 is resolved.

- Table 16.1 COL Item 46

The applicant completes GTS SR 3.3.4.2.4 by removing the brackets from "valve" so that it states, "Perform LOGIC SYSTEM FUNCTIONAL TEST including valve actuation." This change resolves Table 16.1 COL Item 46.

Based on the above evaluation, PTS 3.3.4.2 and bases are acceptable.

### 16.4.6.9 *3.3.5.1 Control Rod Block Instrumentation*

GTS 3.3.5.1 and bases are incorporated by reference into the PTS and bases with the following departures and COL items:

- STD DEP T1 3.4-1 Safety-Related I&C Architecture [bases only]

See Chapter 7 and Subsection 16.4.6.1 of this SER for the evaluation of this departure.

- STD DEP 16.3-64 LCO 3.3.5.1 Control Rod Block Instrumentation

This departure corrects a typographical error in GTS 3.3.5.1 Required Action B.2 by replacing the final "or" with "of" in the statement "Verify RCIS blocks control rod movement by attempting to withdraw one rod or one gang or rods." This change is acceptable.

- STD DEP 16.3-65 LCO 3.3.5.1 Control Rod Block Instrumentation

This departure corrects an error in the bracketed Note for GTS SR 3.3.5.1.1, Channel Functional Test for Function 1.a, "RCIS Automated Thermal Limit Monitor," in Table 3.3.5.1-1, by replacing "[10]% RTP" with "[30]% RTP" so that the Note for PTS SR 3.3.5.1.1 states, "Not

required to be performed until 1 hour after Thermal Power is > 30% RTP." The 30% value is correct because it is in agreement with PTS Table 3.3.5.1-1, Note (a) for the applicability of the ATLM. See the discussion of **RAI 16-21 Issue 10** at the beginning of Section 16.4 of this SER regarding the applicability of the ATLM. Therefore, the Note of PTS SR 3.3.5.1.1 and Departure STD DEP 16.3-65 are acceptable.

- STD DEP 16.3-66 — LCO 3.3.5.1 Control Rod Block Instrumentation [bases only]

This departure corrects the "LCO" section of the bases for GTS 3.3.5.1 by changing from three to four channels the number of required operable channels of the reactor mode switch - shutdown position Function, when the reactor mode switch is in the shutdown position. This change is acceptable because it is in agreement with GTS Table 3.3.5.1-1, Function 2, "Reactor Mode Switch - Shutdown Position," requirements for required channels. Therefore, the "LCO" section of the bases for PTS Table 3.3.5.1 for Table 3.3.5.1-1 Function 2 and Departure STD DEP 16.3-66 are acceptable.

- STD DEP 16.3-67 — LCO 3.3.5.1 Control Rod Block Instrumentation [bases only]

This departure corrects the bases for GTS 3.3.5.1 Required Actions E.1 and E.2 by removing the word "in" in the beginning phrase of the sentence, "If there are failures in of the Reactor Mode Switch – Shutdown Position Function the plant must be placed in a condition where the LCO does not apply." This departure also corrects the next sentence by replacing the phrase, "and initiating to fully inserting of all" with "and initiating full insertion of all." Because these corrections are editorial in nature and do not change the meaning or intent of these statements, the bases for PTS 3.3.5.1 Required Actions E.1 and E.2 and Departure STD DEP 16.3-67 are acceptable.

- STD DEP 16.3-99 — Bases Allowable Value Misstatements [bases only]

See Subsection 16.4.6.1 for the evaluation of this departure.

- STD DEP 16.3-101 — Bases LCO 3.3.5.1, REQUIRED ACTIONS A.1 and C.1 [bases only]

This departure revises the bases for GTS 3.3.5.1 Required Actions A.1 and C.2 by providing additional justification for the 72-hour completion time for restoring one ATLM channel or one RWM channel to operable status, respectively. Specifically, the departure adds the phrase "the low probability of an event occurring coincident with a failure in the remaining OPERABLE channel." The applicant initially proposed these changes in response to **RAI 16-21 Issue 9**, and this departure in response to **RAI 16-65 Issue 5**, which this SER discusses in the beginning of Section 16.4. The departure is acceptable because the revised bases are consistent with the STS.

- STD DEP 16.3-102 — Bases SR 3.3.5.1.6 [bases only]

This departure revises the bases for GTS SR 3.3.5.1.6 by providing additional justification for the 24-hour frequency for performing a channel check of the ATLM. Specifically, the departure revises the bases, with additions indicated by underlining, as follows:

> The Frequency is based upon operating experience that demonstrates channel failure is rare and on the online diagnostics that monitor the channels for proper operation. The specified high reliability of each channel provides confidence that a channel failure will be rare. The CHANNEL CHECKs every 24 hours supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

The applicant initially proposed these changes in response to **RAI 16-21 Issue 11**, and this departure in response to **RAI 16-65 Issue 6**, which this SER discusses in the beginning of Section 16.4. The departure is acceptable because the revised bases are consistent with the STS.

- Table 16.1 COL Items 47 and 48

The applicant completes PTS 3.3.5.1 Required Actions A.1 and C.1 by removing the brackets from the 72-hour completion times for restoring one ATLM channel or one RWM channel to operable status, respectively. These changes are acceptable because "72-hours" is consistent with the STS. Therefore, Table 16.1 COL Items 47 and 48 are resolved. In addition, as this SER describes in the evaluation of the responses to **RAI 16-21 Issue 9 and 16-65 Issue 5** in the beginning of Section 16.4, the applicant also proposes changes to the associated bases, which the staff found acceptable, as described in the discussion of Departure STD DEP 16.3-101, above. The staff verified that Revision 4 of the COL application incorporates the bases changes and Departure STD DEP 16.3-101.

- Table 16.1 COL Item 49

The applicant provides the site-specific value of "> 30% RTP" for the applicability condition for the ATLM control rod block function. See the discussion of **RAI 16-21 Issue 10** at the beginning of Section 16.4 of this SER. This change completes PTS SR 3.3.5.1.1, SR 3.3.5.1.4, Table 3.3.5.1-1 Function 1.a and Footnote (a), and the bases for these requirements. Therefore, this change resolves Table 16.1 COL Item 49.

- Table 16.1 COL Item 50

The applicant completes PTS SR 3.3.5.1.1 and bases by replacing the Channel Functional Test Frequency of "[92] days" with "31 days" for Table 3.3.5.1-1 control rod block Function 1.a, "ATLM." This change is acceptable as this SER describes in the discussion of the response to **RAI 16-21 Issue 4**, in Section 16.4. This change therefore resolves Table 16.1 COL Item 50. The staff verified that Revision 4 of the COL application includes these changes.

- Table 16.1 COL Item 51

The applicant completes PTS SR 3.3.5.1.2 and bases by replacing the Channel Functional Test Frequency of "[92] days" with "31 days" for Table 3.3.5.1-1 control rod block Function 1.b, "Rod Worth Minimizer." This change is acceptable as this SER describes in the discussion of the response to **RAI 16-21 Issue 4**, in Section 16.4. This change therefore resolves Table 16.1 COL Item 51. The staff verified that Revision 4 of the COL application includes these changes.

- Table 16.1 COL Item 52

The applicant provides the site-specific value of "≤ 30% RTP" for the low-power setpoint for the ATLM control rod block function and "≥ 10% RTP" for the low-power setpoint for the RWM control rod block function. See the discussion of **RAI 16-21 Issue 10** at the beginning of Section 16.4 of this SER. This change completes PTS SR 3.3.5.1.3 and SR 3.3.5.1.4 and the bases for these requirements. This change therefore resolves Table 16.1 COL Item 52.

- Table 16.1 COL Item 53

The applicant provides the site-specific value of "≤ 10% RTP" for the applicability condition for the RWM control rod block function. See the discussion of **RAI 16-21 Issue 10** at the beginning of Section 16.4 of this SER. This change completes PTS SR 3.3.5.1.3, Table 3.3.5.1-1 Function 1b and Footnote b, and the bases for these requirements. This change therefore resolves Table 16.1 COL Item 53.

- Table 16.1 COL Item 54

The applicant completes PTS SR 3.3.5.1.6 and bases by removing the brackets from the 24-hour Frequency of GTS SR 3.3.5.1.6 and the associated bases. This SR requires performing a channel check of process parameter and setpoint inputs to the ATLM, Function 1.a of Table 3.3.5.1-1. The proposed site-specific 24-hour frequency is acceptable as described in the beginning of Section 16.4 of this SER in the discussion of **RAI 16-21 Issue 11**. Therefore, Table 16.1 COL Item 54 is resolved. In addition, as discussed in the evaluation of the responses to **RAI 16-21 Issue 11** and **16-65 Issue 6**, at the beginning of Section 16.4 of this SER, the applicant also proposes changes to the associated bases, which the staff found acceptable, as described earlier in the discussion of Departure STD DEP 16.3-102. The staff verified that Revision 4 of the COL application incorporates the bases changes.

Based on the above evaluation, PTS 3.3.5.1 and bases are acceptable.

### 16.4.6.10 *3.3.6.1 Post Accident Monitoring (PAM) Instrumentation*

GTS 3.3.6.1 and bases are incorporated by reference into the PTS and bases with the following departures and COL items:

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

See the evaluation of this departure in Subsection 16.4.6.1.

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

See the evaluation of this departure in Subsection 16.4.9.11.

- STD DEP 7.5-1 — Post-Accident Monitoring (Drywell Pressure)

This departure updates the ABWR PAM design requirements to more closely follow the guidance of RG 1.97, BTP HICB-10, and TMI-related criteria 10 CFR 50.34. The departure revises the design requirements to better comply with RG 1.97. Exemptions to these design requirements in the referenced ABWR DCD are no longer needed because of the redesign.

RG 1.97 states that Type A variables provide the primary information required to permit the control room operator to take the specified manually controlled actions for which no automatic control is provided. These actions are required for safety systems to accomplish their safety function for DBA events. Therefore, the drywell and wetwell pressure readings are categorized as Type A variables because they are used by the operator to determine whether to initiate drywell or wetwell spray to prevent the primary containment from exceeding pressure or temperature limits. Secondary containment air temperature is deleted as a PAM variable because it is not a required PAM variable in Table 2 of RG 1.97 or in 10 CFR 50.34. This departure affects the PTS and bases by:

- Changing Function 5.b in PTS Table 3.3.6.1-1 from "Containment Wide Range Pressure" to "Wetwell Pressure";

- Adding Function 13, "Wetwell Atmosphere Temperature," to PTS Table 3.3.6.1-1;

- Changing the discussion of Functions 5.a and 5.b in the LCO section of the bases for PTS 3.3.6.1 to show that Drywell Pressure and Wetwell Pressure are Type A Instruments (Category I PAM variables), and for Function 5.b to show the correct reference to Wetwell Pressure, rather than Containment Wide Range Pressure; and

- Adding a discussion of Function 13 to the "LCO" section of the bases for PTS 3.3.6.1, explaining that Wetwell Atmosphere Temperature is a Category I variable and is therefore a required function for post-accident monitoring.

Chapter 7 of this SER contains an evaluation of STD DEP 7.5-1. Based on that evaluation, the above changes in PTS 3.3.6.1 and the bases are acceptable.

In **RAI 16-33,** NRC staff requested the applicant to justify deleting the Containment Atmospheric Monitors-Drywell Hydrogen and Oxygen Analyzer, and Containment Atmospheric Monitors-Well Hydrogen and Oxygen Analyzer PAM functions from GTS 3.3.6.1 Table 3.3.6.1-1, "Post Accident Monitoring Instrumentation," in Departure STD DEP 7.5-1. The applicant's response dated August 20, 2009, explains that the justification for deleting GTS 3.3.6.1, PAM Instrumentation, Functions 11 and 12, "Containment Atmospheric Monitors - Drywell and Wetwell Hydrogen and Oxygen Analyzer," is in Departure STD DEP T1 2.14-1, not Departure STD DEP 7.5-1. **RAI 16-33** is resolved based on the evaluation of Departure STD DEP T1 2.14-1 in Subsection 16.4.9.11 of this SER and on the following commitment in the applicant's letter responding to **RAI 16-33**:

> It is recognized that the change to COLA Part 2, Tier 2, Section 6.2.5.5 Instrumentation Requirements, deleting the phrase "safety-grade" in the sentence "As discussed in Subsection 6.2.5.2, ~~safety grade~~ oxygen monitoring is provided in the wetwell and drywell by the CAMS." does not specify STD DEP T1 2.14-1 as the source of the change. COLA Part 2, Section 6.2.5.5 will be revised to identify STD DEP T1 2.14-1 as the source of the change.

The staff verified that Revision 4 of the COL application incorporates this change in Part 2, Subsection 6.2.5.5.

- STD DEP 16.3-77 — LCO 3.3.6.1, Post Accident Monitoring (PAM) Instrumentation [bases only]

This departure corrects the instrumentation description for Table 3.3.6.1-1 PAM Function 4, "Suppression Pool Water Level," in the "LCO" section of the bases for GTS 3.3.6.1 to match the suppression pool water level instrumentation description in DCD Section 7.5 for the ABWR certified design. The ABWR design uses four divisions of narrow range level instrumentation measuring from 0.5 meters above to 0.5 meters below normal water level, and two wide range instruments measuring from the center line of the ECCS suction piping to the wetwell spargers. Because this change makes the bases for PTS 3.3.6.1 consistent with the ABWR DCD and the design of STP Units 3 and 4, Departure STD DEP 16.3-77 is acceptable.

- STD DEP 16.3-78 — LCO 3.3.6.1, Post Accident Monitoring (PAM) Instrumentation

In this departure the applicant proposes to remove the containment water level parameter from the PAM PTS because this parameter does not meet the criteria of 10 CFR 50.36 for inclusion in the TS, as stated in a letter dated May 9, 1988, from T. E. Murley (NRC) to R. F. Janeck (BWROG); 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 refers to PAM variable categories defined by RG 1.97 Revision 3. Specifically, the applicant classifies the GTS 3.3.6.1 instrument function for drywell water level as Category 2 non-type A, and the instrument function for drywell sump level as Category 3 non-type A. As stated in the bases for GTS 3.3.6.1, 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). In Section 2.2.2 of Part 7 of the COL application, the applicant states in the discussion of STD DEP 16.3-78 that "Lower drywell level instrumentation is described as 'not warranted' in the [ABWR] DCD" but does not provide a specific DCD section for this quote. NRC staff issued **RAI 16-54** requesting the applicant to explain why the drywell water level is classified as Category 2 non-type A and the drywell sump level is classified as Category 3 non-type A; and to reference the specific parts of the documents, standards, guides, or regulations that are cited for the justification. The staff pointed out that:

> 10 CFR 52.79(a)(17) requires that information with respect to compliance with technically relevant positions of the Three Mile Island requirements of 50.34(f) must be provided in a final safety analysis report, with three exceptions; 10 CFR 50.34(f)(1)(xii), 10 CFR 50.34(f)(2)(ix), and 10 CFR 50.34(f)(3)(v). The three exceptions to 50.34(f) deal with hydrogen control and containment integrity. The relevant requirements of 50.34(f) dealing with accident monitoring instrumentation, specifically 50.34(f)(2)(xvii), are retained by 52.79(a)(17).

The applicant's response to **RAI 16-54** dated September 24, 2009 (ML092710290), states that ABWR DCD Subsection 7.5.2.1(2)(e) justifies the classification of the drywell sump level as a Category 3 non-type A variable:

> An exception is made to Regulatory Guide 1.97 as written for the design category for the equipment drain sump level. Rather than Category 1, General Electric considers the Category 3 design requirements to be more appropriate for the following reason: Indication of drywell floor drain sump level provides monitoring of leakage to the drywell and will be an early indication of a very small reactor

> coolant system leak/break for those events for which the drywell cooling system remains operable. However, it is primarily a backup variable to other indications of reactor coolant system leaks/breaks such as drywell pressure or drywell radiation level. In addition, containment water level is provided as a Type D, Category 2 variable. A lower design classification for drywell sump level is therefore appropriate and triplicated instrument channels are not necessary.

The staff noted that ABWR DCD Chapter 7, Table 7.5-2, "ABWR PAM Variable List," states that the drywell sump level is a Type B and C Category 3 variable, as discussed in Subsection 7.5.2.1(2)(e).

In addition, the applicant states that ABWR DCD Subsection 7.5.2.1(2)(o) provides a description of instrumentation for monitoring the containment water level, which Subsection 7.5.2.1(2)(e) states is a Type D, Category 2 variable, and refers to it as drywell water level monitoring. DCD Subsection 7.5.2.1(2)(o) states:

> The lower drywell water level measurement below the RPV (other than sump level) is not warranted because of its inability to survive a severe accident (core melt) and because of the following: When the suppression pool level is increased to accommodate severe accident drywell flooding (per the ABWR emergency procedure guidelines (EPGs)), suppression pool level will stop increasing while the water spills into the lower drywell through the vents. Once drywell and wetwell water levels equalize, the increase in drywell level will be monitored by the wetwell water level monitors up to the bottom of the RPV. (See also upper drywell water level monitoring for instrument overlap.)
>
> In addition to the above discussion of lower drywell water level monitoring, the ABWR design provides for two (2) upper drywell water level monitors. The range of these instruments [is] from approximately 0.5 meters below the RPV (lower drywell and above wetwell to lower drywell vents) to the maximum primary containment water level limit (MPCWLL) (upper drywell and approximately five (5) meters above TAF). This lower range provides an approximately 0.5 meter instrument overlap with the wetwell water level instruments and therefore provides four (4) instruments for monitoring water immediately below the RPV during severe accident conditions.
>
> Two (2) wide range upper drywell level measurements are sufficient, since there is sufficient margin between the TAF and MPCWLL to allow controlling water with the highest level measurement, should the instruments disagree, and still assure containment integrity and core coverage for containment flooding with no severe accident condition.

The staff noted that ABWR DCD Chapter 7, Table 7.5-2, "ABWR PAM Variable List," states that drywell water level is a Type D Category 2 variable, as discussed in Subsection 7.5.2.1(2)(o).

In Section 7.5.2 of the FSER for the ABWR design certification rule, "Safety-Related Display Instrumentation and Information Systems Important to Safety - Findings and Conclusions," the staff stated:

> Based on the above discussions and findings, the staff concludes that the ABWR design includes the necessary operator display information and, therefore, meets

the requirements of RG 1.97 for post-accident monitoring instrumentation and TMI Action Plan Item I.D.2 for the SPDS, and is acceptable.

In summary, the applicant's response to **RAI 16-54** states that drywell water level monitoring consists of separate instrumentation for monitoring the wetwell water level (suppression pool water level), which is a Type C Category 1 variable that is included in GTS Table 3.3.6.1-1 as PAM Function 4. The upper drywell water level is a Type D Category 2 variable that should not be included in GTS Table 3.3.6.1-1. Furthermore, the drywell sump level is a Type B and C Category 3 variable that should also not be included in GTS Table 3.3.6.1-1. Based on the above information from the ABWR DCD and ABWR FSER, the staff concluded 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 the GTS Table 3.3.6.1-1 and may be omitted from PTS Table 3.3.6.1-1, as proposed by Departure STD DEP 16.3-78. The staff verified that Section 2.2.2 of Part 7 of Revision 4 of the COL application incorporates in STD DEP 16.3-78, the additional justification for the omission of Function 13 from PTS 3.3.6.1 and bases, as proposed in the applicant's response to **RAI 16-54**. Therefore, Departure STD DEP 16.3-78 is acceptable and **RAI 16-54** is resolved.

- Table 16.1 COL Item 55

The applicant completes the discussion in the "LCO" section of the bases for PTS 3.3.6.1, Table 3.3.6.1-1, Function 8, "Primary Containment Isolation Valve (PCIV) Position," by removing the brackets from the following paragraph: "[For this plant, the PCIV position PAM instrumentation consists of position switches, associated connections and control room indication for active PCIVs. Check valves and manual valves are not required to have position indication.]" Because this paragraph is an accurate description, Table 16.1 COL Item 55 is resolved.

- Table 16.1 COL Item 56

The applicant completes PTS SR 3.3.6.1.1, Channel Check, and bases by removing the brackets from the Frequency of "[31] days." This frequency is consistent with the STS and is therefore acceptable. Table 16.1 COL Item 55 is resolved.

- Table 16.1 COL Item 57

The applicant completes the Applicability of PAM Function 9, "Startup Range Neutron Monitor - Neutron Flux," by removing the brackets from "[10]% RTP" in Table 3.3.6.1-1 Footnote (c) "When power is ≤ [10] % RTP." The applicant's response to **RAI 16-21** states that the 10% RTP value is based on the "capability of instrument detection and accuracy." This response is acceptable and therefore resolves Table 16.1 COL Item 57.

- Table 16.1 COL Item 58

The applicant completes the Applicability of PAM Function 10, "Average Power Range Monitor - Neutron Flux," by removing the brackets from "[10]% RTP" in Table 3.3.6.1-1 Footnote (d) "When power is > [10] % RTP." In the response to **RAI 16-21**, the applicant states the 10% RTP value is based on the "capability of instrument detection and accuracy." This response is acceptable and therefore resolves Table 16.1 COL Item 58.

Based on the above evaluation, PTS 3.3.6.1 and bases are acceptable.

### 16.4.6.11 *3.3.6.2 Remote Shutdown System*

GTS 3.3.6.2 and bases are incorporated by reference into the PTS and bases with the following departures and COL items:

- STD DEP T1 2.14-1 Hydrogen Recombiner Requirements Elimination

See the discussion of this departure in Subsection 16.4.9.11.

- STD DEP T1 3.4-1 Safety-Related I&C Architecture [bases only]

See Chapter 7 and Subsection 16.4.6.1 of this SER for the evaluation of this departure.

- STD DEP 8.3-1 Plant Medium Voltage Electrical System Design [bases only]

See the evaluation of this departure in Subsection 16.4.11.1.

- STD DEP 16.3-59 LCO 3.3.6.2, Remote Shutdown System [bases only]

Function 13 of GTS Table 3.3.6.2-1 is the "RPV Narrow Shutdown Range Water Level." The departure changes the title in the PTS to "RPV Shutdown Range Water Level." This change is consistent with DCD Section 7.4.1.4.4. The departure makes similar changes to the bases for PTS 3.3.6.2. These administrative changes improve the consistency between the PTS and the FSAR and do not reduce any GTS requirements. Therefore, this departure is acceptable.

- STD DEP 16.3-60 LCO 3.3.6.2, Remote Shutdown System [bases only]

This departure adds the RSW Strainer Differential Pressure Instrumentation to the list of Remote Shutdown System parameters monitored as Function 17 in the "LCO" section of the bases for PTS 3.3.6.2. This departure is acceptable because it makes the PTS bases consistent with FSAR Figure 7.4-2.

- Table 16.1 COL Item 59

The applicant completes the bases for Required Action A.1 of PTS 3.3.6.2 by removing the brackets from the Completion Time of "[90] days," so that the bases for PTS 3.3.6.2 Required Action A.1 states, "The Required Action is to restore the inoperable division of the Function to OPERABLE status within 90 days." The 90-day Completion Time is acceptable as indicated by the absence of brackets in GTS 3.3.6.2 Required Action A.1. This change therefore resolves Table 16.1 COL Item 59.

- Table 16.1 COL Item 60

The applicant completes PTS SR 3.3.6.2.1, "Perform CHANNEL CHECK for each required instrumentation channel," by removing the brackets from the Frequency of "[31] days" for RSS instrumentation Functions 1 through 23 in Table 3.3.6.2-1. The 31-day frequency is consistent with the STS and therefore acceptable. This change therefore resolves Table 16.1 COL Item 60.

Based on the above evaluation, PTS 3.3.6.2 and bases are acceptable.

### 16.4.6.12 *3.3.7.1 Control Room Habitability Area (CRHA) Emergency Filtration (EF) System Instrumentation*

GTS 3.3.7.1 and bases are incorporated by reference into the PTS and bases with the following departure and COL item:

- STD DEP 16.3-61 LCO 3.3.7.1, CRHA EF System Instrumentation

GTS Table 3.3.7.1-1 includes two footnotes that are not referenced in the table. This departure omits Footnotes (a) and (b) from PTS Table 3.3.7.1-1. The footnotes are associated with the applicability of the CRHA EF instrumentation. Because the applicability of the instrumentation is specified by the applicability statement of PTS 3.3.7.1, the footnotes are not needed. Therefore, this departure is acceptable.

- STD DEP 16.3-99 Bases Allowable Value Misstatements [bases only]

See Subsection 16.4.6.1 of this SER for the evaluation of this departure.

- STD DEP 16.3-100 Setpoint Control Program Implementation

The applicant proposes Departure STD DEP 16.3-100 in response to **RAI 16-65 Issue 1**. The departure omits the "allowable value" column of GTS Table 3.3.7.1-1 from PTS Table 3.3.7.1-1 as part of implementing "Option 3" of DC/COL-ISG-8 for limiting safety system settings. The departure also revises the following GTS SRs so that PTS 3.3.7.1 requires performing these SRs in accordance with TS 5.5.2.11, "Setpoint Control Program":

- SR 3.3.7.1.2, Channel Functional Test; and
- SR 3.3.7.1.3, Channel Calibration.

The changes to GTS 3.3.7.1 are acceptable based on the NRC staff's conclusion that the applicant's response to **RAI 16-65 Issue 1** is acceptable. The changes to GTS 3.3.7.1 also complete Table 16.1 COL Item 61, as described later in this subsection. The staff verified that Revision 4 of the COL application, Parts 2, 4, and 7 includes this departure. Section 16.2 of this SER lists the subsections of this SER that address the changes to the GTS and bases that are within the scope of the departure. The beginning part of Section 16.4 of this SER describes all of the changes to the GTS and bases that are within the scope of the departure.

- Table 16.1 COL Item 61

The applicant completes PTS SR 3.3.7.1.3 using "Option 3" of DC/COL-ISG-8 by proposing to revise GTS SR 3.3.7.1.3 in the COL application (Revision 4) to state, "Perform CHANNEL CALIBRATION in accordance with TS 5.5.2.11, 'Setpoint Control Program.'" and establishing PTS 5.5.2.11.

PTS SR 3.3.7.1.3 is acceptable based on the resolution of **RAI 16-65 Issue 1**, which this SER describes at the beginning of Section 16.4. However, Table 16.1 COL Item 61 remained unresolved pending completion of the review of the setpoint methodology and PTS 5.5.2.11.b, which was tracked in the SER with open items as part of **Open item 16-1** (**RAI 16-65**). The staff finds that WCAP-17119-P Revision 2 is acceptable, as described in Section 7.1.4 of this report.

In addition, the staff finds that the SCP is acceptable, as described in Section 16.4.15.6.11 of this report. Therefore, Table 16.1 COL Item 61 is resolved.

- Table 16.1 COL Item 62

The applicant completes PTS SR 3.3.7.1.1 by replacing the bracketed 24-hour Frequency of SR 3.3.7.1.1, the channel check for CRHA EF system instrumentation Function 1, "Control Room Ventilation Radiation Monitors," with a Frequency of 12 hours with no brackets. This frequency is acceptable because it is consistent with the STS. This change resolves Table 16.1 COL Item 62. The change in frequency is a part of the applicant's response to **RAI 16-21 Issue 12**, which this SER describes in the beginning of Section 16.4.

- Table 16.1 COL Item 63

The applicant completes SR 3.3.7.1.2, "Perform CHANNEL FUNCTIONAL TEST," and bases by replacing the bracketed Frequency of "[92] days" with "31 days" for CRHA EF instrumentation Functions 2 and 3 in Table 3.3.7.1-1. This change is acceptable as this SER describes in the discussion of the response to **RAI 16-21 Issue 4**, in the beginning of Section 16.4. The staff verified that Revision 4 of the COL application includes these changes. Therefore, Table 16.1 COL Item 63 is resolved.

Based on the above evaluation, PTS 3.3.7.1 and bases are acceptable.

### 16.4.6.13 *3.3.8.1 Electric Power Monitoring*

GTS 3.3.8.1 and bases are incorporated by reference into the PTS and bases with two departures and three Table 16.1 COL items:

- STD DEP 16.3-62 LCO 3.3.8.1, Electric Power Monitoring [bases only]

GTS 3.3.8.1 Action C must be entered when "Required Action and associated Completion Time of Condition A or B is not met in MODE 1, 2, or 3." Action D must be entered when "Required Action and associated Completion Time of Condition A or B is not met in MODE 4 or 5." The associated bases for Actions C and D refer only to Condition B. Therefore, Condition A is added to the descriptions for ACTIONS C and D in the bases for PTS 3.3.8.1. This change is consistent with the intent of Actions C and D and makes the bases consistent with Conditions C and D. Therefore, this departure is acceptable.

- STD DEP 16.3-100 Setpoint Control Program Implementation

The applicant proposes Departure STD DEP 16.3-100 in response to **RAI 16-65 Issue 1**. The departure omits the "allowable value" in GTS SR 3.3.8.1.2 from PTS SR 3.3.8.1.2 as part of implementing "Option 3" of DC/COL-ISG-8 for limiting safety system settings. The departure also revises the following GTS SRs so that PTS 3.3.8.1 requires performing these SRs in accordance with TS 5.5.2.11, "Setpoint Control Program":

- SR 3.3.8.1.1, Channel Functional Test; and
- SR 3.3.8.1.2, Channel Calibration.

The changes to GTS 3.3.8.1 are acceptable based on the NRC staff's conclusion that the applicant's response to **RAI 16-65 Issue 1** is acceptable. The changes to GTS 3.3.8.1 also

complete Table 16.1 COL Item 64, as described later in this subsection. The staff verified that Revision 4 of the COL application, Parts 2, 4, and 7 includes this departure. Section 16.2 of this SER lists the subsections of this SER that address the changes to the GTS and bases that are within the scope of the departure. The beginning part of Section 16.4 of this SER describes all of the changes to the GTS and bases that are within the scope of the departure.

- Table 16.1 COL Item 64

The applicant completes PTS SR 3.3.8.1.2 using "Option 3" of DC/COL-ISG-8 by proposing to revise GTS SR 3.3.8.1.2 in the COL application (Revision 4) to state, "Perform CHANNEL CALIBRATION" in accordance with TS 5.5.2.11, 'Setpoint Control Program,'" and establishing PTS 5.5.2.11.

PTS SR 3.3.8.1.2 is acceptable based on the resolution of **RAI 16-65 Issues 1** and **2**, which this SER describes at the beginning of Section 16.4, and as described in the evaluation of Departure STD DEP 16.3-100 in this subsection. However, Table 16.1 COL Item 64 remained unresolved pending completion of the review of the setpoint methodology and PTS 5.5.2.11.b, which was tracked in the SER with open items as part of **Open item 16-1** (**RAI 16-65**). The staff finds that WCAP-17119-P, Revision 2 is acceptable, as described in Section 7.1.4 of this report. In addition, the staff finds that the SCP is acceptable, as described in Section 16.4.15.6.11 of this report. Therefore, Table 16.1 COL Item 64 is resolved.

- Table 16.1 COL Item 65

The applicant completes PTS SR 3.3.8.1.1, "Perform CHANNEL FUNCTIONAL TEST," and bases by replacing the bracketed Frequency of "[92] days" with "31 days" for Electrical Power Monitoring instrumentation. This change is acceptable as this SER describes in the discussion of the response to **RAI 16-21 Issue 4**, in the beginning of Section 16.4. This change therefore resolves Table 16.1 COL Item 65. The staff verified that Revision 4 of the COL application includes this change.

- Table 16.1 COL Item 66

The applicant completes PTS SR 3.3.8.1.2, "Perform CHANNEL CALIBRATION," by replacing the bracketed Frequency of "[92] days" with "18 months" for Electrical Power Monitoring instrumentation. This change is acceptable because it matches the bases for GTS SR 3.3.8.1.2, which state, "The Frequency is based upon the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis." This change therefore resolves Table 16.1 COL Item 66. The staff verified that Revision 4 of the COL application includes this change.

Based on the above evaluation, PTS 3.3.8.1 and bases are acceptable.

### 16.4.6.14 *3.3.8.2 Reactor Coolant Temperature Monitoring—Shutdown*

GTS 3.3.8.2 and bases are incorporated by reference into the PTS and bases with one departure and two Table 16.1 COL items:

- STD DEP 16.3-63 — LCO 3.3.8.2, Reactor Coolant Temperature Monitoring – Shutdown [bases only]

The "Background" section of the bases for GTS 3.3.8.2 states, "The temperature monitoring instrumentation will provide temperature indication and trends to the operator in the main control room during RHR decay heat removal operation. One temperature monitoring for each RHR channel is available to monitor reactor coolant temperature at the inlet to the RHR heat exchanger." This departure adds the word "transmitter" after the word "monitoring" to be consistent with the terminology in use. This clarification is consistent with the design and the site-specific terminology. Therefore, this departure is acceptable.

- Table 16.1 COL Item 67

The applicant completes PTS SR 3.3.8.2.1, "Perform CHANNEL CHECK," and bases by removing the brackets from the Frequency of "[7] days" for Reactor Coolant Temperature Monitoring - Shutdown instrumentation. This change is acceptable because it is consistent with the STS. This change therefore resolves Table 16.1 COL Item 67. The staff verified that Revision 4 of the COL application includes this change.

- Table 16.1 COL Item 68

The applicant completes PTS SR 3.3.8.2.2, "Perform CHANNEL FUNCTIONAL TEST," and bases by replacing the bracketed Frequency of "[92] days" with "31 days" for Reactor Coolant Temperature Monitoring - Shutdown instrumentation. This change is acceptable as this SER describes in the discussion of the response to **RAI 16-21 Issue 4**, in the beginning of Section 16.4. This change therefore resolves Table 16.1 COL Item 68. The staff verified that Revision 4 of the COL application includes this change.

Based on the above evaluation, PTS 3.3.8.2 and bases are acceptable.

Based on the above, PTS Section 3.3 and bases are acceptable.

### 16.4.7 PTS Section 3.4 – Reactor Coolant System

This PTS section has the following departures and COL items:

- STD DEP 7.3-12 — Leak Detection and Isolation System Sump Monitoring
- 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 [bases only]
- STD DEP 16.3-7 — LCO 3.4.2, Safety/Relief Valves (S/RVs) [bases only]
- STD DEP 16.3-8 — LCO 3.4.9 RCS Pressure and Temperature (P/T) Limits [bases only]
- STD DEP 16.3-9 — LCO 3.4.7, Alternate Decay Heat Removal [bases only]

- STD DEP 16.3-11 — LCO 3.4.3, RCS Operational LEAKAGE [bases only]
- Table 16.1 COL Items 69 through 75

### 16.4.7.1 *3.4.1 Reactor Internal Pumps (RIPs) - Operating*

GTS 3.4.1 and bases are incorporated by reference into the PTS and bases with the following departures and COL information:

- STD DEP 16.3-5 — LCO 3.4.1, Reactor Internal Pumps (RIPs) – Operating

This departure corrects the GTS text of SR 3.4.1.1 and its bases from "Verify that at least the required number of RIPs 'are' OPERABLE at any thermal power level" to "Verify that at least the required number of RIPs 'is' operating at any thermal power level." This change makes the SR 3.4.1.1 text consistent with LCO 3.4.1, which requires the RIPs to be "in operation." Because the LCO is applicable in Modes 1 and 2 (power operation and startup with the pumps operating), this departure is acceptable.

- STD DEP 16.3-6 — LCO 3.4.1, Reactor Internal Pumps (RIPs) – Operating [bases only]

The "Background" section of the bases for GTS 3.4.1 states, "The reason for having variable recirculation flow is to compensate for reactivity effects of boiling over a wide range of power generation (i.e. 55% RTP to 100% RTP)." This departure revises the lower end of the range in the PTS bases from "55%" to "70%" to be consistent with the design, as described in FSAR Subsection 5.4.1.2(2), "Power Generation Design Bases." Therefore, this departure is acceptable.

- Table 16.1 COL Item 69

The applicant completes PTS LCO 3.4.1 and bases in Revision 3 of the COL application by omitting the bracketed optional provisions regarding unit operation with fewer than nine RIPs operating. The applicant elects not to adopt optional provisions for unit operation with fewer than nine RIPs operating. The applicant states that at this time analysis does not support the optional flexibility to operate with fewer than nine RIPs. The staff found this response acceptable. Therefore, Table 16.1 COL Item 69 is resolved.

- Table 16.1 COL Item 70

The applicant completes the "References" section of the bases for PTS 3.4.1 in Revision 3 of the COL application by omitting Reference 3 from the bases for PTS 3.4.1. The applicant elects not to provide a plant-specific analysis for operation with fewer than nine RIPs operating. The applicant states that at this time analysis does not support the optional flexibility to operate with fewer than nine RIPs. The staff found this response acceptable. Therefore, Table 16.1 COL Item 70 is resolved.

Based on the above evaluation, PTS 3.4.1 and bases are acceptable.

### 16.4.7.2 *3.4.2 Safety/Relief Valves*

GTS 3.4.2 and bases are incorporated by reference into the PTS and bases with the following departure and one COL item:

- STD DEP 16.3-7 — LCO 3.4.2, Safety/Relief Valves (S/RVs) [bases only]

The bases of GTS 3.4.2 state, "The transient evaluations in Reference 3 are based on these setpoints, but also include the additional uncertainties of +/- 1% of the nominal setpoint to account for potential setpoint drift to provide an added larger degree of conservatism." Reference 3 is DCD Chapter 15. The transients in Chapter 15 do not take credit for the "safety" function of the safety relief valves (S/RVs) but credit the "relief" function. Therefore, the phrase has been modified to indicate that the "overpressurization evaluation" is the appropriate event, as documented in Reference 2 (DCD Tier 2, Section 5.2.2). Therefore, this departure is acceptable.

- Table 16.1 COL Item 71

The applicant completes the bases for PTS 3.4.2 by removing the brackets from the reactor vessel steam dome pressure value of 6.55 MPaG (950 psig) in the bases for SR 3.4.2.2, regarding the steam dome pressure for opening the S/RV when manually actuated. The applicant states in a partial response to **RAI 16-1** that this pressure is a "Representative value based on industry operating experience (950 psig) to allow proper testing without damaging the valve." The pressure value of 6.55 MPaG is also acceptable as indicated by the absence of brackets in the Note for GTS SR 3.4.2.2. Therefore, Table 16.1 COL Item 71 is resolved.

Based on the above evaluations, PTS 3.4.2 and bases are acceptable.

### 16.4.7.3 *3.4.3 RCS Operational LEAKAGE*

GTS 3.4.3 and bases are incorporated by reference into the PTS and bases with the following departures and COL item:

- STD DEP 7.3-12 — Leak Detection and Isolation System Sump Monitoring

This departure describes modifications to the GTS limits and alarm setpoint for reactor coolant pressure boundary leakage. It changes the total leakage limit, averaged over the previous 24-hour period, from 95 L/min (25 gpm) to 114 L/min (30 gpm), and the unidentified leakage limit from 3.785 L/min (1 gpm) to 19 L/min (5 gpm). It also adds a limit of unidentified leakage increase of 8 L/min (2 gpm) within the previous 4-hour period while in Mode 1. Subsection 5.2.5.9 of the FSAR Tier 2 states that the changes in the total leakage limit and the unidentified leakage limit satisfy Position C.9 in RG 1.45. The staff issued **RAI 05.02.05-1** requesting the applicant revise this departure with information in the evaluation to address how these changes also satisfy Regulatory Positions C.2 and C.5 in RG 1.45.

The applicant's response to this RAI dated June 26, 2008 (ML081970231), states, "In NUREG-1503, 'Final Safety Evaluation Report Related to the Certification of the Advanced Boiling Water Reactor Design,' July 1994, page 5-11, the NRC found that:

The sensitivity and response time for all these primary detection systems is 3.79 L/min (1 gpm) or its equivalent in less than 1 hour, thus satisfying Positions C.2 and C.5 of RG 1.45, Revision 0.

Departure STD DEP 7.3-12 does not make any changes to the sensitivity or response time for the primary detection systems. Consequently, NRC's finding that these systems satisfy Positions C.2 and C.5 of RG 1.45, Revision 0 remains valid and effective.

As described in Section 5.2.5 of this SER, this response resolved **RAI 05.02.05-1**. Therefore, Departure STD DEP 7.3-12 is acceptable.

In **RAI 16-2** the staff requested the applicant to justify using less conservative values for unidentified leakage in the PTS than those used in the GTS. In the ABWR GTS, LCO 3.4.3.b and LCO 3.4.3.c limit the RCS operational leakage to 3.785 L/min and 98.4 L/min, respectively. In Revision 2 of the PTS, LCO 3.4.3.b and LCO 3.4.3.c limit the RCS operational leakage to 19 L/min and 114 L/min, respectively. In addition, the applicant adds a limit of 8 L/min for the increase in the unidentified leakage rate within the previous 4 hours, in PTS LCO 3.4.3.d. The staff also asked the applicant to justify these PTS values.

The applicant's response to **RAI 16-2** dated August 10, 2009 (ML092240105), states that the selection of values for unidentified leakage in PTS LCO 3.4.3.b and LCO 3.4.3.c is based on material selection that minimizes the susceptibility to intergranular stress corrosion cracking (IGSCC) and is consistent with equivalent STS LCO 3.4.3 and bases. This issue is also discussed in Subsection 5.2.5.4 of this SER, along with the applicant's responses to **RAI 05.02.05-1**, **RAI 05.02.05-2**, and **RAI 05.02.05-3**. Based on the resolution of these RAIs related to FSAR Subsection 5.2.5, the staff found the rationale for the limits in PTS LCO 3.4.3.b and LCO 3.4.3.c acceptable.

In addition, the applicant's response to **RAI 16-2** proposes to revise STD DEP 7.3-12 by removing the proposed limit on an increase in the unidentified leakage rate, which it had specified in Revision 2 of the COL application as PTS LCO 3.4.3.d. The applicant's response also proposes to withdraw associated changes to PTS 3.4.3 action and surveillance requirements, and bases. The applicant's response to **RAI 16-2** states that STD DEP 7.3-12 had proposed to include this provision in PTS 3.4.3 because of its inclusion as a bracketed item in the STS (NUREG–1434, "Standard Technical Specifications General Electric Plants, BWR/6," Revision 3.1). The applicant reasons that PTS LCO 3.4.3 does not need the bracketed requirement of STS LCO 3.4.5.d (corresponding to PTS LCO 3.4.3.d) because the STS and Revision 6 of the ESBWR GTS 3.4.2 both limit unidentified RCS operational leakage to 5 gpm. PTS LCO 3.4.3 also does not need this bracketed STS requirement because the ABWR piping, which is made of austenitic stainless steel, is not susceptible to IGSCC. Additionally, as identified in the response to **RAI 05.02.05-2**, the ABWR design provides an alarm to identify a rapid increase in the unidentified leakage rate to warn the operators in a timely fashion before exceeding the specified limit of 19 L/min (5 gpm) for unidentified leakage.

Based on the applicant's response to **RAI 16-2** and the conclusions in Section 5.2.5 of this SER, the staff concluded that the changes to GTS LCO 3.4.3.b and LCO 3.4.3.c proposed by Departure STD DEP 7.3-12 are acceptable. The staff verified that Revision 4 of the COL no longer includes the limit on an increase in the unidentified leakage rate. Therefore, **RAI 16-2** is resolved.

- STD DEP 16.3-11 LCO 3.4.3, RCS Operational LEAKAGE [bases only]

This departure changes the bases for GTS 3.4.3 by replacing, “Crack behavior from experimental programs (Refs. 4 and 5) shows leak rates of tens of thousands liters per second will precede crack instability” to “Crack behavior from experimental programs (Refs. 4 and 5) shows leak rates of hundreds of liters per minute will precede crack instability.” The text change from “tens of thousands liters per second” to “hundreds of liters per minute” is consistent with industry guidance and NRC communications. Reference 5 in the “References” section of the bases for PTS 3.4.3 is NUREG–76/067, "Technical Report -- Investigation and Evaluation of Cracking in Austenitic Stainless Steel Piping of Boiling Water Reactor Plants," October 1975. The departure changes this reference to NUREG–75/067, which is the correct reference. Therefore, Departure STD DEP 16.3-11 is acceptable.

- Table 16.1 COL Item 72

The applicant completes the Applicable Safety Analyses section of the bases for PTS 3.4.3, by removing the brackets from the sentence, “The 3.785 L/min limit is a small fraction of the calculated flow from a critical crack in the primary system piping (Ref. 6).” The applicant thus indicates that this sentence is applicable to STP Units 3 and 4. Therefore, Table 16.1 COL Item 72 is resolved. The applicant has replaced the value of “3.785” with “19,” per Departure STD DEP 7.3-12, as described previously in this subsection of the SER.

- Table 16.1 COL Item 73

In the Reference section of the bases for PTS 3.4.3, Reference 6 states, “[COL Application for Leak-Before-Break Qualification for Piping Systems].” As described in Departure STD DEP 7.3-12, the leak-before-break criteria are not applied to the COL application for STP Units 3 and 4. Accordingly, the bases for PTS 3.4.3 give Reference 6 as “FSAR, Section 5.2.5.5.1.” This information is acceptable. Therefore, Table 16.1 COL Item 73 is resolved.

Based on the above evaluation, PTS 3.4.3 and bases are acceptable.

### 16.4.7.4 *3.4.4 RCS Pressure Isolation Valve (PIV) Leakage*

GTS 3.4.4 and bases are incorporated by reference into the PTS and bases with no departures and no COL items. Therefore, PTS 3.4.4 and bases are acceptable.

### 16.4.7.5 *3.4.5 RCS Leakage Detection Instrumentation*

GTS 3.4.5 and bases are incorporated by reference into the PTS and bases with no departures and no COL items. Therefore, PTS 3.4.5 and bases are acceptable.

### 16.4.7.6 *3.4.6 RCS Specific Activity*

GTS 3.4.6 and bases are incorporated by reference into the PTS and bases with no departures and no COL items. Therefore, PTS 3.4.6 and bases are acceptable.

### 16.4.7.7 *3.4.7 Residual Heat Removal (RHR) Shutdown Cooling System-Hot Shutdown*

GTS 3.4.7 and bases are incorporated by reference into the PTS and bases with the following departure and no COL items:

- STD DEP 16.3-9 — LCO 3.4.7, Alternate Decay Heat Removal [bases only]

This departure changes the name “spent fuel pool cooling system” to “fuel pool cooling and cleanup (FPC) system” to be consistent with ABWR DCD Tier 1, Section 2.6.2, DCD Tier 2, Section 9.1.3, and the plant-specific P&IDs. This departure is an editorial change to correct an inconsistency and is acceptable.

This departure also corrects the bases of GTS 3.4.7 and GTS 3.4.8, which describe the FPC system as an alternate source of decay heat removal in Mode 3, hot shutdown, and Mode 4, cold shutdown. However, the FPC system cannot be used for decay heat removal in Mode 3 and Mode 4. So the bases for Required Action A.3 of PTS 3.4.7 and Required Action A.1 for PTS 3.4.8 do not describe the FPC system as an alternate source of decay heat removal. This departure is acceptable.

The FPC system can be used as an alternate source of decay heat removal in Mode 5, refueling; but the bases of GTS 3.9.7 and GTS 3.9.8 do not describe the FPC system as a method for alternate decay heat removal system during Mode 5 operations. Therefore, the bases for Required Action A.1 of PTS 3.9.7 and PTS 3.9.8 do describe the FPC system as an alternate source of decay heat removal. This information is acceptable.

Therefore, based on the above, this departure is acceptable.

Based on the above evaluations, PTS 3.4.7 and bases are acceptable.

### 16.4.7.8 *3.4.8 Residual Heat Removal (RHR) Shutdown Cooling System - Cold Shutdown*

GTS 3.4.8 and bases are incorporated by reference into the PTS and bases with the following departure and no COL items:

- STD DEP 16.3-9 — LCO 3.4.7, Alternate Decay Heat Removal [bases only]

See the discussion under PTS 3.4.7 in Subsection 16.4.7.7 of this SER.

Based on the above evaluation, PTS 3.4.8 and bases are acceptable.

### 16.4.7.9 *3.4.9 RCS Pressure and Temperature (P/T) Limits*

GTS 3.4.9 and bases are incorporated by reference into the PTS and bases with the following departure and COL items:

- STD DEP 16.3-8 LCO 3.4.9 RCS Pressure and Temperature (P/T) Limits [bases only]

See the discussion of PTS 5.7.1.6, "RCS PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)," in Subsection 16.4.15.8.6 of this SER for the staff's evaluation of this departure. This departure revises the "ASA" and "References" sections of the bases for GTS 3.4.9 to delete the reference to the methodology establishing the ABWR P/T Limits. This deletion is acceptable because PTS 5.7.1.6 specifies the methodology.

- Table 16.1 COL Items 74 and 75

The applicant's response to **RAI 16-21 Issue 14** states that the RCS temperature bracketed values in GTS SR 3.4.9.4 and SR 3.4.9.5 are acceptable for vessel and head flange surveillance entry conditions. The staff verified the removal of the brackets in Revision 3 of the COL application. The resolution of Table 16.1 COL Items 74 and 75 by completing these SRs was pending the acceptance of the PTLR, which was tracked in the SER with open items as part of **Open Item 16-1**. See the discussion of the applicant's response to **RAI 16-21 Issue 14** at the beginning of Section 16.4 of this SER. Based on the staff finding that the pressure-temperature limits methodology is acceptable, as described in the resolution of **RAI 5.3.2-1** in Section 5.3.2 of this report, **RAI 16-21 Issue 14**, and Table 16.1 COL Items 74 and 75 are resolved.

Based on the above evaluation, PTS 3.4.9 and bases are acceptable.

#### 16.4.7.10 *3.4.10 Reactor Steam Dome Pressure*

GTS 3.4.10 and bases are incorporated into the PTS and bases by reference with no departures and no COL items. Therefore, PTS 3.4.10 and bases are acceptable.

Based on the above, PTS Section 3.4 and bases are acceptable.

### 16.4.8 PTS Section 3.5 – ECCS

This PTS section has the following departures and COL items:

- STD DEP 8.3-1 Plant Medium Voltage Electrical System Design
- STD DEP 16.3-10 LCO 3.5.1, ECCS – Operating [bases only]
- Table 16.1 COL Items 76 and 77

#### 16.4.8.1 *3.5.1 ECCS-Operating*

GTS 3.5.1 and bases are incorporated by reference into the PTS and bases with the following departures and COL item:

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

See the evaluation of this departure in Subsection 16.4.11.1.

- STD DEP 16.3-10 LCO 3.5.1, ECCS - Operating [bases only]

This departure revises the "Background" section of the bases for GTS 3.5.1 as follows:

- Replaces the range of pressures in which the HPCF system and the RCIC system are designed to operate. The range of pressures in the PTS bases is appropriate for the HPCF and RCIC systems at STP Units 3 and 4 and is consistent with the FSAR. This change is therefore acceptable.
- Replaces the condensate storage tank (CST) with the suppression pool to be consistent with the actual design. The PTS bases states that the HPCF system includes a full flow test line that routes water from and to the suppression pool. This information is acceptable.
- Clarifies the description of the pneumatic supply to the ADS valves. This information is acceptable.

This departure also revises the "LCO" section of the bases for GTS 3.5.1 by removing LCO 3.7.2, "RCW/RSW and UHS-Shutdown," and LCO 3.7.3, "RCW/RSW and UHS Refueling" from a summary of specifications that support the emergency core cooling systems during operation in Modes 1, 2, and 3. This change is acceptable because these specifications do not apply in Modes 1, 2, and 3, which are the modes in which Specification 3.5.1 is applicable.

Based on the above conclusions, Departure STD DEP 16.3-10 is acceptable.

- Table 16.1 COL Item 76

The applicant completes the bases for PTS SR 3.5.1.9, "Verify each ADS valve opens when manually actuated," by removing the brackets from the following paragraph.

> Adequate pressure at which this test is to be performed is [6.55 MPaG] (the pressure recommended by the valve manufacturer)] … Therefore, this SR is modified by a Note that states the Surveillance is not required to be performed until 12 hours after reactor steam dome pressure is ≥ [6.55 MPaG].

The applicant states in a partial response to **RAI 16-1** that 6.55 MPaG pressure is a "Representative value based on industry operating experience (950 psig) to allow proper testing without damaging the valve." The pressure value of 6.55 MPaG is also acceptable, as indicated by the absence of brackets in the Note for GTS SR 3.5.1.9. Therefore, Table 16.1 COL Item 71 is resolved. This resolves Table 16.1 COL Item 76.

Based on the above evaluation, PTS 3.5.1 and bases are acceptable.

### 16.4.8.2 *3.5.2 ECCS—Shutdown*

GTS 3.5.1 and bases are incorporated by reference into the PTS and bases with no departures and one Table 16.1 COL item:

- Table 16.1 COL Item 77

The applicant completes PTS SR 3.5.2.2 and bases by providing a value of 700,000 L for the minimum water volume and a value of 5.4 m for the equivalent minimum level in the condensate storage tank to ensure adequate NPSH for the HPCF subsystem pump. These values are

consistent with the ABWR DCD and the design of STP Units 3 and 4. Therefore, Table 16.1 COL Item 77 is resolved.

Based on the above, PTS 3.5.2 and bases are acceptable.

Based on the above evaluation, PTS Section 3.5 and bases are acceptable.

### 16.4.9 PTS Section 3.6 – Containment Systems

This PTS section has the following departures and COL items:

- STD DEP T1 2.14-1 — Hydrogen Recombiner Requirements Elimination [bases only]
- STD DEP 6.2-2 — Containment Analysis [bases only]
- STD DEP 16.3-29 — LCO 3.6.4.1, Secondary Containment
- STD DEP 16.3-30 — LCO 3.6.4.1, Secondary Containment [bases only]
- STD DEP 16.3-31 — LCO 3.6.4.3, SGT System [bases only]
- 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 [bases only]
- STD DEP 16.3-34 — LCO 3.6.1.6, Wetwell-to-Drywell Vacuum Breakers [bases only]
- STD DEP 16.3-36 — LCO 3.6.2.3, Residual Heat Removal (RHR) Suppression Pool Cooling [bases only]
- STD DEP 16.3-37 — LCO 3.6.2.3, Residual Heat Removal (RHR) Suppression Pool Cooling [bases only]
- STD DEP 16.3-43 — LCO 3.6.1.1, Primary Containment [bases only]
- STD DEP 16.3-44 (withdrawn) — LCO 3.6.1.1, Primary Containment
- STD DEP 16.3-45 — LCO 3.6.1.1, Primary Containment [bases only]
- 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 [bases only]
- STD DEP 16.3-71 (withdrawn) — LCO 3.6.1.3, Primary Containment Isolation Valves (PCIVs)
- STD DEP 16.3-72 (withdrawn) — LCO 3.6.1.3, Primary Containment Isolation Valves (PCIVs)
- STD DEP 16.3-73 — LCO 3.6.1.3, Primary Containment Isolation Valves (PCIVs) [bases only]
- STD DEP 16.3-74 — LCO 3.6.1.3, Primary Containment Isolation Valves (PCIVs) [bases only]

- 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 [bases only]

- Table 16.1 COL Items 78 through 87

### 16.4.9.1 *3.6.1.1 Primary Containment*

GTS 3.6.1.1 and bases are incorporated by reference into the PTS and bases with the following departures and COL items:

- STD DEP 6.2-2 — Containment Analysis [bases only]

This departure updates the containment analysis described in the ABWR DCD in three areas: (1) the modeling of flow and enthalpy into the drywell for the feedwater following an FWLB, (2) the modeling of the drywell connecting vents for the FWLB and MSLB, and (3) the modeling of decay heat.

This departure also makes the following changes: (1) it updates the suppression pool temperature limit from the DCD specified value of 97.2 °C to a value of 100 °C, and (2) it revises the assumed elapsed time between the start of the LOCA and the initiation of suppression pool cooling and containment sprays from 10 minutes to 30 minutes.

This departure also changes the "Applicable Safety Analyses (ASA)" sections of the bases for GTS 3.6.1.1, 3.6.1.2, and 3.6.1.4 to reflect the changes in the containment analysis. These changes show the peak containment pressure ($P_a$) from the containment analysis. Specifically, the GTS bases are changed (as indicated by underlined and lined-out text) so that the fourth paragraph of the ASA section of the bases for PTS 3.6.1.1 states:

> The maximum allowable leakage rate for the primary containment ($L_a$) is 0.5% by weight of the containment air per 24 hours at the ~~maximum~~ calculated peak containment pressure ($P_a$) of ~~0.269 MPaG~~ 281.8 kPaG or ~~0.259~~ 0.257% by weight of the containment air per 24 hours at the reduced pressure of Pt of 144.8 ~~MPaG~~ kPaG (Ref. 1).

In addition, the departure changes Reference 1 in the bases for PTS 3.6.1.1 to WCAP-17058, June 2009. See Chapters 6 and 15 of this SER for the evaluation of this topical report and associated changes to the DCD. The values of the allowed leakage rate and the associated reduced test pressure are site-specific information associated with Table 16.1-1 COL Item 78.

The departure changes the GTS bases (as indicated by underlined and lined-out text) so that the first paragraph of the "ASA" section of the bases for PTS 3.6.1.2 states:

> The primary containment is designed with a maximum allowable leakage rate ($L_a$) of 0.5% (excluding MSIV leakage) by weight of the containment air per 24 hours at the calculated maximum peak containment pressure ($P_a$) of ~~0.269 MPaG~~ 281.8 kPaG (Ref. 3) …

In addition, the departure changes Reference 3 in the bases for PTS 3.6.1.2 to WCAP-17058, June 2009.

The departure changes the GTS bases (as indicated by underlined and lined-out text) so that the second paragraph of the "ASA" section of the bases for PTS 3.6.1.4 states:

> The maximum calculated drywell pressure occurs during ~~the reactor blowdown phase of the DBA, which is determined to be~~ a feedwater line break. The calculated peak drywell pressure for this limiting event is ~~0.269 MPaG~~ 281.8 kPaG (Ref. 1).

In addition, the departure changes Reference 1 in the bases for PTS 3.6.1.4 to WCAP-17058, June 2009. Because the pressure value of 281.8 kPaG corresponds to the calculated maximum peak containment pressure ($P_a$) in the revised containment analyses, the changes to the GTS bases in Departure STD DEP 6.2-2 are acceptable. Based on this information, the evaluation of WCAP-17058, and the evaluation of associated changes to the DCD (which the departure incorporates into the FSAR), Departure STD DEP 6.2-2 is acceptable.

- STD DEP 16.3-43 LCO 3.6.1.1, Primary Containment [bases only]

This departure makes an editorial correction in the "Background" section of the bases for GTS 3.6.1.1 by replacing "air lock is" with "air locks are" in the sentence, "The primary containment air lock is OPERABLE, except as provided in LCO 3.6.1.2, 'Primary Containment Air Locks.' This change is appropriate because the ABWR primary containment design has two airlocks. Therefore, Departure STD DEP 16.3-43 is acceptable.

- STD DEP 16.3-44 (withdrawn) LCO 3.6.1.1, Primary Containment

This departure proposes deleting a reference to GTS SR 3.6.1.3.13 (PTS SR 3.6.1.3.13) to verify the main steam isolation valve leakage rate within limit, from a list of containment leakage related SRs in the bases for GTS SR 3.6.1.1.1. The applicant justified this change by stating that the "containment analyses assume a specific leakage limit for $L_a$ and a specific leakage limit for main steam isolation valve leakage. Therefore, main steam line leakage is excluded from the $L_a$ term." The staff issued **RAI 16-57** requesting the applicant to clarify how assuming a specific leakage limit for main steam isolation valve leakage justifies its exclusion from leakage rate testing in accordance with 10 CFR Part 50, Appendix J. The applicant's response to this RAI dated September 24, 2009, states that this departure will be removed because the proposed change is unnecessary. The staff verified that removal of this departure has been incorporated in Parts 2, 4, and 7 of Revision 4 of the COL application. This response resolves **RAI 16-57** and Departure STD DEP 16.3-44.

- STD DEP 16.3-45 LCO 3.6.1.1, Primary Containment [bases only]

This departure corrects the "Reference" section of the bases for GTS 3.6.1.1 by replacing GTS Reference 2, which is 'DCD Tier 2 Section 15.1, "Decrease in Reactor Coolant Temperatures,"' with the correct reference 'FSAR Section 15.6, "Decrease in Reactor Coolant Inventory."' Because this change is consistent with the FSAR, Departure STD DEP 16.3-45 is acceptable. The staff verified that this change is included in Revision 4 of the COL application.

- Table 16.1 COL Item 78

The applicant completes the bases for PTS 3.6.1.1 by providing the correct value for the maximum allowable primary containment leakage rate in percent by weight of the containment air per 24 hours, and the corresponding correct value of the containment test pressure (Pt) in

units of kPaG, so that the fourth paragraph of the "ASA" section of the bases for PTS 3.6.1.1 states (with changes indicated by underlined and lined-out text):

> The maximum allowable leakage rate for the primary containment ($L_a$) is 0.5% by weight of the containment air per 24 hours at the ~~maximum~~ calculated peak containment pressure ($P_a$) of ~~0.269 MPaG~~ 281.8 kPaG or ~~0.259~~ 0.257 % by weight of the containment air per 24 hours at the reduced pressure of Pt of 144.8 ~~MPaG~~ kPaG (Ref. 1).

Other changes indicated by the markup are associated with STD DEP 6.2-2, which is described above. This change therefore resolves Table 16.1-1 COL Item 78.

- Table 16.1 COL Item 79

The applicant completes the bases for PTS SR 3.6.1.1.1 by removing the brackets from the GTS bases phrase "[resilient seal primary containment purge valve leakage testing (SR 3.6.1.3.7),]" because the information is correct. This change resolves Table 16.1-1 COL Item 79.

Based on the above evaluation, PTS 3.6.1.1 and bases are acceptable.

### 16.4.9.2 *3.6.1.2 Primary Containment Air Locks*

GTS 3.6.1.2 and bases are incorporated by reference into the PTS and bases with the following departures and COL item:

- STD DEP 6.2-2 — Containment Analysis [bases only]

See the evaluation of this departure in Subsection 16.4.9.1 of this SER.

- STD DEP 16.3-69 — LCO 3.6.1.2, Primary Containment Air Locks

This departure makes an editorial correction to GTS 3.6.1.2 Required Action B.2 by replacing "air lock( )" with "air lock(s)" so that PTS 3.6.1.2 Required Action B.2 states, "Lock an OPERABLE door closed in the affected air lock(s)." Therefore, Departure STD DEP 16.3-69 is acceptable.

- STD DEP 16.3-70 — LCO 3.6.1.2, Primary Containment Air Locks [bases only]

This departure makes an editorial correction to the "Background" section of the bases for GTS 3.6.1.2 by replacing "SR 3.6.1.1.1" with "SR 3.6.2.1" so that the sentence in the PTS bases states, "SR 3.6.1.2.1 leakage rate requirements conform with 10 CFR Part 50, Appendix J (Ref. 2), as modified by approved exemptions." Therefore, Departure STD DEP 16.3-70 is acceptable.

- Table 16.1 COL Item 80

The applicant completes PTS SR 3.6.1.2.1 and bases by providing the door seal gap test pressure site-specific value of 0.0689 MPaG in PTS SR 3.6.1.2.1, and by replacing the GTS bases sentence, "The acceptance criteria were established [during initial air lock and primary

containment OPERABILITY testing]" with the site-specific sentence, "The acceptance criteria were established based on the type of door seal used and will be verified during initial air lock and primary containment OPERABILITY testing." This proposed change to the bases is acceptable because it states the correct basis for the acceptance criteria. These changes resolve Table 16.1 COL Item 80.

Based on the above evaluation, PTS 3.6.1.2 and bases are acceptable.

### 16.4.9.3 *3.6.1.3 Primary Containment Isolation Valves*

GTS 3.6.1.3 and bases are incorporated by reference into the PTS and bases with the following departures and COL items. Three proposed departures were withdrawn.

- STD DEP 6.2-1 (withdrawn) — Not included in Revision 3 of COL application
- STD DEP 16.3-71 (withdrawn) — LCO 3.6.1.3, Primary Containment Isolation Valves (PCIVs)

This departure proposed to address an apparent conflict between GTS SR 3.6.1.3.1, which requires the primary containment purge valves to be "closed and sealed," and SR 3.6.1.3.2, which requires the same valves to be "closed." However, a Note allows the valves to be opened when the valves are being used for inerting, de-inerting, pressure control, ALARA, or air quality considerations for personnel entry, or Surveillances that require the valves to be open. The applicant asserts, "Utilizing the Note in SR 3.6.1.3.2 would always be a failure to meet SR 3.6.1.3.1." Furthermore, the applicant reasons that because the ABWR containment utilizes an inert atmosphere, only SR 3.6.1.3.2 is an appropriate SR for the design. Consequently, the applicant proposes several changes to GTS 3.6.1.3, beginning with the deletion of SR 3.6.1.3.1. The staff issued **RAI 16-58** and **RAI 16-60** requesting additional justification for the proposed changes. The applicant's responses to these RAIs dated September 24, 2009, removes the changes proposed by this departure. The staff verified that the removal of this departure has been incorporated in Revision 4 of the COL application, Parts 2, 4, and 7. This response therefore resolves **RAI 16-58**, **RAI 16-60**, and Departure STD DEP 16.3-71.

- STD DEP 16.3-72 (withdrawn) — LCO 3.6.1.3, Primary Containment Isolation Valves (PCIVs)

The applicant proposes to remove a note from GTS SR 3.6.1.3.13 to verify the MSIV leakage rate within limits. The note states, "Results shall be evaluated against acceptance criteria of SR 3.6.1.1.1 in accordance with 10 CFR Part 50, Appendix J, as modified by approved exemptions." The applicant states that this change is justified because the containment radiological analysis takes into account MSIV leakage separately from $L_a$. The staff issued **RAI 16-59** requesting the applicant to clarify how taking into account MSIV leakage separately from $L_a$ in the containment radiological analysis eliminates the need for the Note to GTS SR 3.6.1.3.13. The applicant's response to this RAI dated September 24, 2009, states that STD DEP 16.3-72 will be deleted because it is unnecessary. The staff reviewed the markup of affected pages from Parts 2, 4, and 7 of the COL application (which the applicant included with the letter responding to the RAI) and found them acceptable. The staff verified that Revision 4 of the COL application, Parts 2, 4, and 7, no longer contain the changes proposed in Departure STD DEP 16.3-72. Therefore, **RAI 16-59** and Departure STD DEP 16.3-72 are resolved.

- STD DEP 16.3-73 — LCO 3.6.1.3, Primary Containment Isolation Valves (PCIVs) [bases only]

This departure revises the third paragraph of the "Background" section of the bases for GTS 3.3.1.3 to be consistent with ABWR DCD Tier 2 Chapter 21, Figure 6.2-39 for the atmosphere control system (ACS), by replacing the underlined text with the text that follows.

> (GTS bases text): The primary containment purge lines are 550 mm in diameter; vent lines are 550 mm in diameter. The 550 mm primary containment purge valves are normally maintained closed in MODES 1, 2, and 3 to ensure leak tightness. The isolation valves on the 550 mm vent lines have 50 mm bypass lines around them for use during normal reactor operation. Two additional redundant excess flow isolating dampers are provided on the vent line upstream of the Standby Gas Treatment (SGT) System filter trains. These isolation dampers, together with the PCIVs, will prevent high pressure from reaching the SGT System filter trains in the unlikely event of a loss of coolant accident (LOCA) during venting. Closure of the excess flow isolation dampers will not prevent the SGT System from performing its design function (that is, to maintain a negative pressure in the secondary containment). To ensure that a vent path is available, a 50 mm bypass line is provided around the dampers.
>
> (PTS bases replacement text): The isolation valve on the 550 mm vent line from the drywell has a 50 mm bypass line around it for use during normal reactor operation. The PCIVs will close before fuel failure and prevent high pressure from reaching the SGT system filter trains in the unlikely event of a loss of coolant accident (LOCA) during venting.

The staff reviewed ABWR DCD Figure 6.2-39," Atmospheric Control System P&ID (Sheets 1 – 3)," Table 6.2-7, "Containment Isolation Valve Information – Atmospheric Control System," Table 6.2-8, "Primary Containment Penetration List," and verified the accuracy of the proposed replacement text.

This departure also revises the "Applicable Safety Analyses (ASA)" section of the bases for GTS 3.6.1.3, by replacing the first sentence with the second sentence in the second paragraph:

> (GTS bases): The safety analyses assume that the purge valves were closed at event initiation.
>
> (PTS bases): The safety analyses do not make any explicit assumptions concerning the purge valves at event initiation.

The applicant proposes this editorial change to clarify that the "ASA" makes no assumptions about the purge valves regarding containment isolation. In addition, the applicant proposes to remove the third paragraph of the "ASA" section. The PTS bases omits the third paragraph, which addresses the assumptions used for closure times of PCIVs in the radiological analyses, because the radiological analyses assumes a leakage of $L_a$ from the start of the accident.

Finally, as indicated by the markup of the "ASA" section of the bases for generic TS 3.6.1.3 in Chapter 16 of Part 2 of the COL application, the applicant omits the fifth paragraph of the "ASA" section from the bases for PTS 3.6.1.3. This paragraph states:

> The primary containment purge valves may be unable to close in the environment following a LOCA. Therefore, each of the purge valves is required to remain sealed closed during MODES 1, 2, and 3. In this case, the single failure criterion remains applicable to the primary containment purge valve due to failure in the control circuit associated with each valve. Again, the primary containment purge valve design precludes a single failure from compromising primary containment OPERABILITY as long as the system is operated in accordance with this LCO.

The applicant provides no justification for this change in the discussion of this departure in Section 2.2.2 of Part 7 of Revision 3 of the COL application. This bracketed paragraph is in the "ASA" section of the bases for BWR/6 STS 3.6.1.3, "PCIVs," and applies to units with primary containment purge valves that are not qualified to close under accident conditions. The staff issued **RAI 16-66** requesting the applicant to revise Departure STD DEP 16.3-73 with a description of and justification for this omission. The applicant's response (dated January 13, 2010) revises the departure by adding a justification for omitting the paragraph from the bases for PTS 3.6.1.3. The applicant bases the justification on DCD Tier 2 Subsection 6.2.4.3.2.2.2.3, "Containment Isolation System – Evaluation against General Design Criterion 56 - Effluent Lines from Suppression Pool – Atmospheric Control System (ACS) Lines to Containment." The COL application incorporates by reference this subsection into FSAR Tier 2 Chapter 6. The NRC staff's ABWR FSER, NUREG–1503, Section 6.2.4 addresses the 550 mm primary containment purge valve and exhaust valve closure time as follows:

> The staff finds that the closure time of 20 seconds or less for the ACS isolation valves is acceptable based on GE's accident analysis and justification that slower acting valves are more reliable. The accident analysis in Chapter 15 of the SSAR assumes, among other things, that all containment isolation valves isolate within 60 seconds following a postulated LOCA for calculating the offsite doses. The 20-second or less closure time of the ACS CIVs is small compared to this assumption. Additionally, the analysis assumes primary containment releases through the penetrations to be 0.5-percent by weight per day of the containment free volume. The contribution to the offsite doses due to the leakage through the ACS CIVs for the period from 5- to 20-seconds following a LOCA is insignificant when compared to the offsite doses due to the assumed leakage through the penetrations, and is acceptable.

The revised departure states, "This statement has been deleted because the evaluation in FSAR Subsection 6.2.4.3 shows that the design of the primary containment purge valves is such that they do not require blocking in order to isolate on a DBA." The staff finds that the proposed justification in Departure STD DEP 16.3-73 is acceptable for omitting the above paragraph from the "ASA" section of the bases for PTS 3.6.1.3. Therefore, **RAI 16-66** is resolved. Based on the above, Departure STD DEP 16.3-73 is acceptable. The staff verified that Parts 2 and 7 of Revision 4 of the COL application include the revised departure.

- STD DEP 16.3-74 — LCO 3.6.1.3, Primary Containment Isolation Valves (PCIVs) [bases only]

This departure corrects and clarifies the "LCO" section of the bases for GTS 3.6.1.3 regarding the discussion of testing, required actions, and surveillance requirements. The GTS bases state:

Purge valves with resilient seals, secondary bypass valves, MSIVs, and hydrostatically tested valves must meet additional leakage rate requirements.

The additional leakage rate requirements for the purge valves with resilient seals, MSIVs, and hydrostatically tested valves are in the following GTS SRs, respectively:

| | |
|---|---|
| [SR 3.6.1.3.7 | Perform leakage rate testing for each primary containment purge valve with resilient seals.] |
| SR 3.6.1.3.13 | Verify leakage rate through each MSIV is ≤ 1 $m^3$/h when tested at ≥ 0.170 MPaG. |
| SR 3.6.1.3.12 | Verify the combined leakage rate of 0.277 $cm^3$/hr times the total number of PCIVs through hydrostatically tested lines that penetrate the primary containment is not exceeded when these isolation valves are tested at ≥ 0.294 MPaG. |

The departure removes the phrase "secondary bypass valves" from the above statement, because GTS 3.6.1.3 specifies no additional surveillance requirements for secondary bypass valve leakage. Therefore, the omission of this reference in the "LCO" section of the bases for PTS 3.6.1.3 is acceptable.

The departure also revises the "Actions" section of the bases for GTS 3.6.1.3 Required Actions A.1 and A.2 to be consistent with the Completion Time for Required Action A.2, which requires verifying the isolation of the affected penetration flow path "Once per 31 days for isolation devices outside primary containment, drywell, and steam tunnel." The bases description did not reflect the "drywell and steam tunnel." Therefore, the departure adds the following words to the discussion in the bases for PTS 3.6.1.3 Required Actions A.1 and A.2, as indicated by the underlined text:

> The Completion Time of "once per 31 days for isolation devices outside primary containment<u>, drywell, and steam tunnel</u>" is appropriate because the valves are operated under administrative controls and the probability of their misalignment is low.

This editorial change to make the bases consistent with the specification is acceptable.

Finally, the departure corrects the bases for GTS SR 3.6.1.3.9 by replacing "The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.6.3.6 overlaps this SR to provide complete testing of the safety function." with "The testing in LCO 3.3.1.1 and LCO 3.3.1.4 overlaps this SR to provide complete testing of the safety function." GTS SR 3.6.1.3.9 states, "Verify each automatic PCIV actuates to the isolation position on an actual or simulated isolation signal." The instrumentation SR that typically overlaps such SRs in the STS is the Logic System Functional Test (LSFT); however, GTS 3.3.1.1 and GTS 3.3.1.4 do not specify an LSFT. The staff issued **RAI 16-67** requesting the applicant to revise this departure to clarify in the bases for PTS 3.6.1.3, those SRs in PTS 3.3.1.1 and PTS 3.3.1.4 that overlap with the PTS SR that corresponds to GTS SR 3.6.1.3.9. The applicant's response dated January 13, 2010, revises Departures STD DEP 16.3-74 and STD DEP 16.3-46 to change the bases for GTS 3.6.1.3 and GTS 3.7.3 to reference the Comprehensive Functional Test as overlapping the actuation surveillance, as follows:

- The bases for GTS SR 3.6.1.3.9 (corresponds to PTS SR 3.6.1.3.8) state, "The Comprehensive Functional Tests (SR 3.3.1.1.9 and SR 3.3.1.4.4) in LCO 3.3.1.1 and LCO 3.3.1.4 overlap this SR to provide complete testing of the safety function."

- The bases for GTS SR 3.7.3.5 (corresponds to PTS SR 3.7.3.6) state, "The Comprehensive Functional Tests (SR 3.3.1.1.9 and SR 3.3.1.4.4) in LCO 3.3.1.1 and LCO 3.3.1.4 overlap this SR to provide complete testing of the safety function."

These changes are acceptable and resolve **RAI 16-67**. The staff verified that Revision 4 of the COL application includes these changes to the bases for PTS SR 3.6.1.3.8 and PTS SR 3.7.3.6, and to STD DEP 16.3-74 and STD DEP 16.3-46. Based on the above, Departures STD DEP 16.3-46 and STD DEP 16.3-74 are acceptable.

- 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 [bases only]

See Subsection 16.4.6.1 of this SER for the evaluation of this departure.

- Table 16.1 COL Item 81

The applicant completes PTS 3.6.1.3 by removing the brackets from bracketed Required Action D.3, which states, "Perform SR 3.6.1.3.7 for resilient seal purge valves closed to comply with required Action D.1." The applicant also removes the brackets from the bracketed periodic Completion Time of "Once per [92] days." This change resolves Table 16.1 COL Item 81.

- Table 16.1 COL Item 82

The applicant completes GTS bracketed SR 3.6.1.3.7, "Perform leakage rate testing for each primary containment purge valve with resilient seals," by removing the brackets in PTS SR 3.6.1.3.7 because this SR is appropriate to the design of STP Units 3 and 4. This change resolves Table 16.1 COL Item 82.

- Table 16.1 COL Items 83, 84, and 85

In the table listing the disposition of the COL items in the **RAI 16-1** response, the applicant lists "Option 2" as the resolution method for Table 16.1 COL Item 83 regarding GTS bracketed SR 3.6.1.3.14, "[Verify each 550 mm primary containment purge valve is blocked to restrict the valve from opening > [50]%.]" The applicant proposes to remove the brackets and use the 50% value because this value is bounding. The staff issued **RAI 16-21, Issue 16** requesting the applicant to justify that the 50% value is bounding and useable. The applicant's response to **RAI 16-21 Issue 16** states that the 550-mm primary containment purge valves are not blocked and therefore, GTS SR 3.6.1.3.14 will be omitted from PTS 3.6.1.3. The applicant also changes the resolution method to "Option 1" for Table 16.1 COL Item 83. The staff verified that the FSAR Chapter 15 analysis in Revision 3 of the COL application supports not having to block the containment purge valves. Therefore, Table 16.1 COL Item 83 is resolved.

In the table listing the disposition of the COL items in the **RAI 16-21** response, and in response to **RAI 16-21 Issues 3** and **17**, the applicant changes the RM for Table 16.1 COL Items 84 and 85 from "n/a" to "Option 1" because of the omission of the bases, including the reviewer's

note, for GTS SR 3.6.1.3.14 from the bases for PTS 3.6.1.3. Based on the acceptance of the omission of GTS SR 3.6.1.3.14 from PTS 3.6.1.3, this site-specific disposition is acceptable. Therefore, Table 16.1 COL Items 84 and 85 are resolved.

Based on the above, PTS 3.6.1.3 and bases are acceptable.

### 16.4.9.4 *3.6.1.4 Drywell Pressure*

GTS 3.6.1.4 and bases are incorporated by reference into the PTS and bases with the following departure and no COL items:

- STD DEP 6.2-2 Containment Analysis [bases only]

See the evaluation of this departure in Subsection 16.4.9.1 of this SER.

Based on the preceding evaluation, PTS 3.6.1.4 and bases are acceptable.

### 16.4.9.5 *3.6.1.5 Drywell Air Temperature*

GTS 3.6.1.4 and bases are incorporated by reference into the PTS and bases with no departures and no COL items. Therefore, PTS 3.6.1.5 and bases are acceptable.

### 16.4.9.6 *3.6.1.6 Wetwell-to-Drywell Vacuum Breakers*

GTS 3.6.1.6 and bases are incorporated by reference into the PTS and bases with the following departure and no COL items:

- STD DEP 16.3-34 LCO 3.6.1.6, Wetwell-to-Drywell Vacuum Breakers [bases only]

This departure removes the allowance described in the "LCO" section of the bases for GTS 3.6.1.6, that the wetwell-to-drywell vacuum breakers may be opened "during testing," because GTS 3.6.1.6 does not specify this allowance. Specifically, the bases are revised as indicated by lined-out text:

> All eight of the vacuum breakers must be OPERABLE for opening. All wetwell-to-drywell vacuum breakers, however, are required to be closed (except ~~during testing or~~ when the vacuum breakers are performing the intended design function).

This departure also removes the description of this allowance from the bases for GTS SR 3.6.1.6.1 as indicated by lined-out text:

> Each vacuum breaker is verified closed (except ~~when being tested in accordance with SR 3.6.1.6.2 or~~ when performing its intended function) to ensure that this potential large bypass leakage path is not present.

In addition, the applicant justifies this departure on the basis that GTS 3.6.1.6 is applicable in Modes 1, 2, and 3, and that SR 3.6.1.6.2 for vacuum breaker functional testing must be performed during a refueling outage, as indicated by the 18-month Frequency, because the vacuum breakers can only be manually operated and are only accessible during an outage.

Therefore, the bases descriptions of the allowance "during testing" are not applicable. For these stated reasons, Departure STD DEP 16.3-34 is acceptable.

Based on the above evaluation, PTS 3.6.1.6 and bases are acceptable.

### 16.4.9.7 *3.6.2.1 Suppression Pool Average Temperature*

GTS 3.6.2.1 and bases are incorporated by reference into the PTS and bases with the following departures and no COL items:

- STD DEP 16.3-32 — LCO 3.6.2.1, Suppression Pool Average Temperature

This departure makes the following changes to the Actions of GTS 3.6.2.1 to clarify the intent. Actions D and E are revised as indicated by underlined and lined-out text:

| | |
|---|---|
| Condition D | Suppression pool average temperature > 43.3 °C ~~but ≤ 48.9°C~~. |
| Required Action D.1 | ~~Verify~~ Determine suppression pool average temperature ~~is ≤ 48.9°C~~. |
| Completion Time | Once per 30 minutes |
| Required Action D.2 | AND Be in MODE 4 |
| Completion Time | 36 hours |
| Condition E | Suppression pool average temperature > 48.9 °C. |
| Required Action E.1 | Depressurize the reactor vessel to < 1.38 MPaG. |
| Completion Time | 12 hours |
| ~~Required Action E.2~~ | ~~AND Be in MODE 4~~ |
| ~~Completion Time~~ | ~~36 hours~~ |

The applicant states that moving the required action to be in Mode 4 (cold shutdown) from Action E to Action D is appropriate because the plant should not be operating indefinitely with suppression pool temperature above 43.3 °C. Determining the suppression pool temperature every 30 minutes is more appropriate than verifying that the temperature is between limits, because upon determining that the temperature exceeds 48.9 °C, Action E will require depressurization. However, Required Action D.2 will continue to require the unit to proceed to a cold shutdown, because Condition D remains applicable regardless of how high the suppression pool temperature rises. These changes remove a potential interpretation issue regarding whether GTS Condition D should be exited if the temperature were to exceed the upper limit. For these reasons, the staff concluded that the revised Actions D and E more accurately meet the intent of the GTS. The applicant also proposes appropriate changes to the bases. Therefore, Departure STD DEP 16.3-32, PTS 3.6.2.1 Actions D and E, and bases are acceptable.

- STD DEP 16.3-33 — LCO 3.6.2.1, Suppression Pool Average Temperature [bases only]

This departure makes an editorial correction to the "LCO" section of the bases for GTS 3.6.2.1. The bases for GTS LCO 3.6.2.1.a and 3.6.2.1.b describe the suppression pool temperature requirements as applying when "THERMAL POWER is < 1%." The LCO states that these limits apply when THERMAL POWER is > 1% RTP. This departure replaces "<" with ">" so that the description of the bases matches the requirements in the LCO. Therefore, Departure STD DEP 16.3-33 is acceptable.

Based on the above evaluation, PTS 3.6.2.1 and bases are acceptable.

### 16.4.9.8 *3.6.2.2 Suppression Pool Water Level*

GTS 3.6.2.2 and bases are incorporated by reference into the PTS and bases with no departures and no COL items. Therefore, PTS 3.6.2.2 and bases are acceptable.

### 16.4.9.9 *3.6.2.3 Residual Heat Removal (RHR) Suppression Pool Cooling*

GTS 3.6.2.3 and bases are incorporated by reference into the PTS and bases with the following departures and no COL items:

- STD DEP 16.3-36 — LCO 3.6.2.3, Residual Heat Removal (RHR) Suppression Pool [bases only]

This departure removes "high pressure core injection" from the following sentence in the "Background" section of the bases for GTS 3.6.2.3: "S/RV leakage, and high pressure core injection and Reactor Core Isolation Cooling System testing increase suppression pool temperature more slowly." This change is acceptable because the ABWR design does not include a high pressure core injection system with a steam turbine-driven pump.

- STD DEP 16.3-37 — LCO 3.6.2.3, Residual Heat Removal (RHR) Suppression Pool Cooling [bases only]

This departure omits Reference 2 of the bases for GTS 3.6.2.3 in the references for the bases PTS 3.6.2.3. This change is acceptable because this reference, which is "ASME Boiler and Pressure Vessel Code, Section XI," is not used in the bases for GTS/PTS 3.6.2.3.

Based on the preceding evaluation, PTS 3.6.2.3 and bases are acceptable.

### 16.4.9.10 *3.6.2.4 Residual Heat Removal (RHR) Containment Spray*

GTS 3.6.2.4 and bases are incorporated by reference into the PTS and bases with no departures and no COL items. Therefore, PTS 3.6.2.4 and bases are acceptable.

### 16.4.9.11 *3.6.3.1 Primary Containment Hydrogen Recombiners*

GTS 3.6.3.1 and bases are incorporated by reference into the PTS and bases with the following departure and COL item:

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

The NRC amended 10 CFR 50.44, "Combustible gas control for nuclear power reactors," 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 departure reflects the elimination of the requirement to maintain equipment needed to mitigate a design-basis LOCA hydrogen release. In Section 2.1 of Part 7 of the COL

application, the applicant describes the effects of this departure on the PTS and bases as follows:

> 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, [GTS] 3.6.3.1, "Primary Containment Hydrogen Recombiners," which established the requirements for the FCS is deleted. [GTS] 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. Support systems associated with the FCS are modified or deleted, as necessary, to support removal of the FCS.
>
> 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 3. 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, [GTS] 3.3.6.1, "Post Accident Monitoring (PAM) Instrumentation," is modified to delete Functions 11 and 12, requirements for the $H_2$ and $O_2$ analyzers in the containment drywell and wetwell. This change to [GTS] 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.

See Chapter 7 of this SER for an evaluation of this departure using the guidance in RG 1.7, "Control of Combustible Gas Concentrations in Containment," Revision 3, dated March 2007, regarding the control of combustible gases. Based on this evaluation, the changes to the PTS and the bases are acceptable.

The applicant's response to **RAI 16-25** states that the description of Departure STD DEP T1 2.14-1 in Section 2.1 of Part 7 of the COL application will be revised by adding the following statement,

> This change was implemented using the guidance contained within Technical Specification Task Force (TSTF)-447-A, Revision 1, "Elimination of Hydrogen Recombiners and Change to Hydrogen and Oxygen Monitors."

The staff verified that the rationale described in TSTF-447-A is applicable to the ABWR containment design. On this basis, **RAI 16-25** is resolved. The staff verified that the description of Departure STD DEP T1 2.14-1 in Section 2.1 of Part 7 of Revision 4 of the COL application includes the proposed change.

- Table 16.1 COL Item 86

The applicant completes GTS 3.6.3.1 SR bracketed acceptance criteria by removing GTS 3.6.3.1 and bases from the PTS and bases, as described in Departure STD DEP T1 2.14-1, which is acceptable. Therefore, Table 16.1 COL Item 86 is resolved.

Based on the above evaluation, the omission of GTS 3.6.3.1 and bases from the PTS and bases is acceptable.

### 16.4.9.12 *3.6.3.2 Primary Containment Oxygen Concentration*

GTS 3.6.3.2 and bases are incorporated by reference into the PTS and bases with the following departure and no COL items:

- STD DEP T1 2.14-1 — Hydrogen Recombiner Requirements Elimination [bases only]

See the evaluation of this departure in Subsection 16.4.9.11.

Based on the above evaluation, PTS 3.6.3.2 and bases are acceptable.

### 16.4.9.13 *3.6.4.1 Secondary Containment*

GTS 3.6.4.1 and bases are incorporated by reference into the PTS and bases with the following departures and no COL items:

- STD DEP 16.3-29 — LCO 3.6.4.1, Secondary Containment

The drawdown time in GTS SR 3.6.4.1.4 is ≤ 120 seconds for the SGT subsystem to drawdown the secondary containment to ≥ 6.4-mm water gauge vacuum. This departure extends this time to "20 minutes" in PTS SR 3.6.4.1.4. The justification for this change is consistency with Tier 1 Table 2.14.4, Item 4.a and the analysis in DCD Subsection 15.6.5.5.1, “Fission Product Releases.” See Section 6.2.3 of this SER for an evaluation of this departure. Based on this evaluation, PTS SR 3.6.4.1.4 and bases are acceptable.

- STD DEP 16.3-30 — LCO 3.6.4.1, Secondary Containment [bases only]

This departure removes the phrase “the primary or” from the last sentence of the “Applicability” section of the bases for GTS 3.6.4.1, as indicated by the lined-out text:

> Therefore, maintaining secondary containment OPERABLE is not required in MODE 4 or 5 to ensure a control volume, except for other situations for which significant releases of radioactive material can be postulated, such as during operations with a potential for draining the reactor vessel (OPDRVs), during CORE ALTERATIONS, or during movement of irradiated fuel assemblies in ~~the primary or~~ secondary containment.

This change is acceptable because the Applicability of GTS 3.6.4.1 includes “during movement of irradiated fuel assemblies” only in “the secondary containment.” Therefore, Departure STD DEP 16.3-30 is acceptable.

Based on the above evaluation, PTS 3.6.4.1 and bases are acceptable.

### 16.4.9.14 *3.6.4.2 Secondary Containment Isolation Valves*

GTS 3.6.4.2 and bases are incorporated by reference into the PTS and bases with no departures or COL items. Therefore, PTS 3.6.4.2 and bases are acceptable.

### 16.4.9.15 *3.6.4.3 Standby Gas Treatment (SGT) System*

GTS 3.6.4.3 and bases are incorporated by reference into the PTS and bases with the following departure and COL item:

- STD DEP 16.3-31 — LCO 3.6.4.3, Standby Gas Treatment (SGT) System [bases only]

This departure corrects an error in the "Reference" section of the bases for GTS 3.6.4.3 by replacing "DCD Tier 2 Section 6.2.3" in Reference 2 with "FSAR Tier 2 Section 6.5.1," which contains the detailed description of the SGT system design. Therefore, Departure STD DEP 16.3-31 is acceptable.

- Table 16.1 COL Item 87

The applicant completes the "Reference" section of the bases for PTS 3.6.4.3 by removing the brackets from the revision number of Reference 5, which is "Regulatory Guide 1.5.2, Rev. 2." This change is acceptable because Revision 2 is the correct revision. Therefore, Table 16.1 COL Item 87 is resolved.

Based on the above evaluation, PTS 3.6.4.3 and bases are acceptable.

Based on the above evaluation, PTS Section 3.6 and bases are acceptable.

## 16.4.10 PTS Section 3.7 – Plant Systems

This PTS section has the following departures and COL items:

- 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, and UHS – Refueling
- 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 (CHRA) – Emergency Filtration (EF) System
- STD DEP 16.3-48 — LCO 3.7.4, Control Room Habitability Area (CHRA) – Emergency Filtration (EF) System [bases only]
- STD DEP 16.3-75 — LCO 3.7.6, Main Condenser Offgas [bases only]
- STD DEP 16.3-76 — LCO 3.7.5, Control Room Habitability Area (CHRA) – Air Conditioning (AC) System [bases only]

- Table 16.1 COL Items 88 through 103

### 16.4.10.1 *3.7.1 RCW System, RSW System and Ultimate Heat Sink - Operating*

GTS 3.7.1 and bases are incorporated by reference into the PTS and bases with the following departures and COL items:

- 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, and UHS – Refueling

GTS 3.7.1 Required Action C.2 and GTS 3.7.2 Required Action B.2 require the restoration of two inoperable RCW/RSW or UHS divisions to operable status within 14 days. These required actions and associated bases are omitted from the PTS and bases because redundant requirements are already included in Action A of each specification. This change is acceptable because it is consistent with the completion time rules of GTS Section 1.3.

This departure also revises the last paragraph of the "Background" section of the bases for GTS 3.7.1, as indicated by the added underlined text:

> Following a DBA or transient, the RCW/RSW System and UHS cooling tower fans will operate automatically without operator action. Manual initiation of supported systems is, however, performed for some cooling operations (e.g., shutdown cooling).

This change is acceptable because it reflects the design description of the UHS system for STP Units 3 and 4 in FSAR Tier 2 Section 9.2.5.

The staff issued **RAI 16-8** requesting the applicant to address the addition of SR 3.7.1.4, SR 3.7.2.4, and SR 3.7.3.4 to operate each cooling tower cell fan for ≥ 15 minutes once per 31 days, in a standard departure in Part 7 of the COL application. These SRs are not part of the GTS and require justification for inclusion in the PTS. The applicant's response to **RAI 16-1** for COL Items 94, 95, and 99 states that STD DEP 16.3-16 will be revised to include the addition of SR 3.7.1.4, SR 3.7.2.4, and SR 3.7.3.4 for testing cooling tower cell fans. In response to **RAI 16-8**, the applicant adds these surveillance requirements to Departure STD DEP 16.3-16, with the following discussion:

> The STP 3&4 UHS design incorporates cooling towers with fans and a UHS basin instead of a UHS spray pond. LCOs 3.7.1, 3.7.2, and 3.7.3 are revised to include SRs 3.7.1.4, 3.7.2.4, and 3.7.3.4, respectively, for monthly surveillance testing of the cooling tower cell fans.

The staff found that these SRs are consistent with the STS, are appropriate to the design of STP Units 3 and 4, and are therefore acceptable. The staff confirmed that these changes are incorporated into Revision 3 of the COL application. **RAI 16-8** is therefore resolved.

The staff issued **RAI 16-9**, **RAI 16-10, and RAI 16-11** requesting the applicant to revise PTS SR 3.7.1.2, SR 3.7.2.2, and SR 3.7.3.2, to verify the water level in the RSW pump well. These

PTS SRs require verification of the water level in the UHS basin. The COL application contained no explanation for why the PTS SRs should not match the GTS SRs, which require verification of the water level in the RSW pump well, not the UHS basin. The applicant's response to these RAIs states that STP Units 3 and 4 will use centrifugal type pumps instead of the wet-pit type pumps assumed in the ABWR DCD. The UHS basin provides the NPSH for the RSW pumps and prevents vortexing in the UHS basin in the design of STP Units 3 and 4. The PTS requirement to verify the level of the UHS basin is sufficient to provide protection for the centrifugal type pumps. The applicant states that a discussion of this change from "RSW pump well" to "UHS basin" in PTS SR 3.7.1.2, SR 3.7.2.2, and SR 3.7.3.2 will be added to Departure STD DEP 16.3-16 in Revision 4 of Part 7 of the COL application, as follows:

> The UHS and RSW system have been redesigned to include the use of centrifugal type pumps located below the bottom of the UHS basin rather than vertical wet-pit type pumps located in pump wells. Thus, the UHS basin water level must be measured in order to verify adequate water level for NPSH and vortex prevention considerations. Therefore, SRs 3.7.1.2, 3.7.2.2 and 3.7.3.2 were revised to verify water level in the UHS basin rather than in the RSW pumps wells.

The staff found this response acceptable, and **RAIs 16-9**, **16-10**, and **16-11** are therefore resolved.

Based upon the proposed changes to the discussion of Departure STD DEP 16.3-16 and the resolution of **RAIs 16-8**, **16-9**, **16-10**, and **16-11**, STD DEP 16.3-16 is acceptable. The staff verified that Revision 4 of the COL application includes the proposed changes to Departure STD DEP 16.3-16.

- Table 16.1 COL Item 88

The applicant completes the GTS 3.7.1 Actions A, B, C, and D, and associated bases by replacing bracketed references to "spray networks" with references to "cooling tower cells" to be consistent with Departure STD DEP 16.3-16 and the description of the UHS system for STP Units 3 and 4 in FSAR Tier 2 Section 9.2.5. This change resolves Table 16.1 COL Item 88.

- Table 16.1 COL Item 89

The applicant completes the "Background" section of the bases for PTS 3.7.1 by replacing the third paragraph in the GTS bases with the one that follows:

> (GTS paragraph) The UHS is [a spray pond with six spray networks. Two spray networks are assigned to each UHS division and are mechanically separated from other divisional networks. The networks and their supply piping are suspended above the pond surface on reinforced concrete columns]. The [spray pond] is sized such that sufficient water inventory is available for all RCW/RSW System post LOCA cooling requirements for a 30 day period with no external makeup water source available (Regulatory Guide 1.27, Ref. 1). Normal makeup for the [spray pond] is provided automatically by the [power cycle heat sink makeup line].
>
> (PTS paragraph) The UHS includes a dedicated water storage basin for each unit. The UHS consists of three mechanically and electrically independent

> cooling tower divisions designed to remove heat from the respective RCW/RSW division. Each unit's UHS structure consists of six cooling tower cells, of which two cells are dedicated to each of the three UHS divisions. During normal plant operation, all three divisions are in service with one cooling tower cell per division in operation. Each unit's UHS basin is sized such that sufficient water inventory is available for all RCW/RSW System post LOCA cooling requirements for a 30 day period with no external makeup water source available (Regulatory Guide 1.27, Ref. 1). Normal makeup for each UHS basin is provided automatically by the onsite well water.

The applicant also replaces "[spray pond]" with "UHS basin" in the first sentence of the fourth paragraph, so that the PTS sentence states, with the changed text underlined:

> Cooling water is pumped from the <u>UHS basin</u> by the RSW pump(s) to the RCW/RSW heat exchangers through the three main redundant supply headers (Divisions A, B and C).

The replacement site-specific information is acceptable because it is consistent with the description of the UHS system design for STP Units 3 and 4 in FSAR Tier 2 Section 9.2.5. This change resolves Table 16.1 COL Item 89.

- Table 16.1 COL Items 90 and 91

The applicant completes PTS SR 3.7.1.1 by replacing "[spray pond]" with "basin," and by replacing "[ ] m" with "19.28 m" so that PTS SR 3.7.1.1 states, "Verify the water level in the UHS basin is ≥ 19.28 m." The replacement site-specific information is acceptable because it is consistent with the description of the UHS system design for STP Units 3 and 4 in FSAR Tier 2 Section 9.2.5. This change resolves Table 16.1 COL Items 90 and 91.

- Table 16.1 COL Items 92 and 93

To be consistent with STD DEP 16.3-16, the applicant completes PTS SR 3.7.1.2 by replacing "[ ] m" with "0.91 m" so that PTS SR 3.7.1.2 states, "Verify the water level in the UHS basin is ≥ 0.91 m." The applicant likewise completes the associated bases so that the bases for PTS SR 3.7.1.2 state, "This SR verifies the water level in the UHS basin to be sufficient for the proper operation of the RSW pumps (net positive suction head and pump vortexing are considered in determining this limit)."

To be consistent with STD DEP 16.3-16, the applicant completes the third paragraph of the "LCO" section of the bases for PTS 3.7.1 by replacing "[33.3]°C" with "32.2°C," and by replacing "[mean sea level (equivalent to an indicated level of ≥ [ ] m) and six OPERABLE spray networks]" with "23.55 m MSL [mean seal level] (equivalent to an indicated level of 19.28 m) and six OPERABLE cooling tower cells," so that the PTS bases paragraph states (with replacement text underlined):

> OPERABILITY of the UHS is based on a maximum RSW water temperature of <u>32.2</u>°C at the inlet to the RCW/RSW heat exchangers with OPERABILITY of each division requiring a minimum water level at or above elevation <u>23.55 m MSL (equivalent to an indicated level of 19.28 m) and six OPERABLE cooling tower cells</u>. The maximum RSW water temperature of <u>32.2</u>°C will insure that the peak

temperature at the inlet to the RCW/RSW heat exchangers will not exceed the designed value of 35°C during a LOCA.

The applicant completes PTS SR 3.7.1.3 by replacing "[33.3]°C" with "33.2°C" so that PTS SR 3.7.1.3 states, "Verify the RSW water temperature at the inlet to the RCW/RSW heat exchangers is ≤ 32.2°C."

The replacement site-specific information is acceptable because it is consistent with the description of the UHS system design for STP Units 3 and 4 in FSAR Tier 2 Section 9.2.5 and Section 9.2, Table 9.2-24. This change resolves Table 16.1 COL Items 92 and 93.

- Table 16.1 COL Item 94

To be consistent with Departure STD DEP 16.3-16, the applicant completes the bases for GTS SR 3.7.1.4 by replacing "UHS [spray network] division" with "UHS cooling tower division" in the bases for the corresponding PTS SR 3.7.1.5; and the bases for GTS SR 3.7.1.5 by replacing "UHS [spray network] in each division" with "UHS cooling tower cell in each division" in the bases for the corresponding PTS SR 3.7.1.6. The replacement site-specific information is acceptable because it is consistent with the description of the UHS system design for STP Units 3 and 4 in FSAR Tier 2 Section 9.2.5. This change resolves Table 16.1 COL Item 94.

Based on the above, PTS 3.7.1 and bases are acceptable.

### 16.4.10.2 *3.7.2 RCW System, RSW System and Ultimate Heat Sink—Shutdown*

GTS 3.7.2 and bases are incorporated by reference into the PTS and bases with the following departures and COL items:

- 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, and UHS – Refueling

See Subsection 16.4.10.1 for the evaluation of this departure.

- STD DEP 16.3-46 — LCO 3.7.2, RCW, RSW, and UHS Applicability

See Subsection 16.4.10.3 for the evaluation of this departure.

- Table 16.1 COL Items 95 and 96

The applicant completes PTS 3.7.2 Actions A, B, and C, and associated bases; and SRs and associated bases by replacing bracketed references to "spray networks" with references to "cooling tower cells," "cooling tower," or "cooling tower division" to be consistent with STD DEP 16.3-16 and the description of the UHS system for STP Units 3 and 4 in FSAR Tier 2 Section 9.2.5.

The applicant completes PTS SR 3.7.2.1 and bases by replacing "[spray pond]" with "basin," and by replacing "[ ] m" with "19.28 m" so that PTS SR 3.7.2.1 states, "Verify the water level in the UHS basin is ≥ 19.28 m."

The replacement site-specific information is acceptable because it is consistent with the description of the UHS system design for STP Units 3 and 4 in FSAR Tier 2 Section 9.2.5 and Section 9.2, Table 9.2-24. This change resolves Table 16.1 COL Items 95 and 96.

- Table 16.1 COL Items 97 and 98

To be consistent with Departure STD DEP 16.3-16, the applicant completes PTS SR 3.7.2.2, by replacing "[ ] m" with "0.91 m" so that PTS SR 3.7.2.2 states, "Verify the water level in the UHS basin is ≥ 0.91 m." The applicant likewise completes the associated bases so that the bases for PTS SR 3.7.2.2 state, "This SR verifies the water level in the UHS basin to be sufficient for the proper operation of the RSW pumps (net positive suction head and pump vortexing are considered in determining this limit)."

The applicant completes PTS SR 3.7.2.3 by replacing "[33.3]°C" with "32.2°C" so that PTS SR 3.7.2.3 states, "Verify the RSW water temperature at the inlet to the RCW/RSW heat exchangers is ≤ 32.2°C."

The replacement site-specific information is acceptable because it is consistent with the description of the UHS system design for STP Units 3 and 4 in FSAR Tier 2 Section 9.2.5 and Section 9.2, Table 9.2-24. This change resolves Table 16.1 COL Items 97 and 98.

Based on the above evaluation, PTS 3.7.2 and bases are acceptable.

### 16.4.10.3 *3.7.3 RCW System, RSW System and Ultimate Heat Sink—Refueling*

GTS 3.7.3 and bases are incorporated by reference into the PTS and bases with the following departure and COL items:

- 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, and UHS – Refueling

See Subsection 16.4.10.1 for the evaluation of this departure.

- STD DEP 16.3-46 — LCO 3.7.2, RCW, RSW, and UHS Applicability

This departure changes the Applicability of GTS 3.7.2 and GTS 3.7.3 to be consistent with the Applicability of GTS 3.9.8, "Residual Heat Removal (RHR) - Low Water Level," and GTS 3.9.7, "RHR - High Water Level," respectively. This change is appropriate because the RCW, RSW, and UHS systems support the RHR system. Therefore, the Mode 5 Applicability of PTS 3.7.2 and PTS 3.9.8 is:

> MODE 5 with irradiated fuel in the reactor pressure vessel (RPV) and with the water level < 7.0 m above the top of the RPV flange

In addition, the Mode 5 Applicability of PTS 3.7.3 and PTS 3.9.7 is:

> MODE 5 with irradiated fuel in the reactor pressure vessel (RPV) and with the water level ≥ 7.0 m above the top of the RPV flange

The "Background," "Applicable Safety Analyses," "LCO," and "Applicability" sections of the bases for GTS 3.7.2 and GTS 3.7.3 are also revised to reflect the change in the Mode 5 Applicability statement. The staff verified that these changes are in Revision 3 of the COL application and concluded that they are acceptable.

Finally, this departure corrects the bases for GTS SR 3.7.3.5 by replacing the sentence "The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.5.1.4 overlaps this SR to provide complete testing of the safety function." with "The testing in LCO 3.3.1.1 and LCO 3.3.1.4 overlaps this SR to provide complete testing of the safety function." GTS SR 3.7.3.5 states, "Verify each RCW/RSW division and associated UHS … division actuates on an actual or simulated initiation signal." The instrumentation SR that typically overlaps with such SRs in the STS is the LSFT. However, GTS 3.3.1.1 and GTS 3.3.1.4 do not specify an LSFT. The staff issued **RAI 16-67** requesting the applicant to revise Departure STD DEP 16.3-46 to clarify, in the bases for PTS 3.7.3, which SRs in PTS 3.3.1.1 and PTS 3.3.1.4 overlap the PTS SR corresponding to GTS SR 3.7.3.5. This SER addresses the resolution **RAI 16-67** in the evaluation of Departure STD DEP 16.3-74 in Subsection 16.4.9.3.

Based on the above and the resolution of **RAI 16-67**, Departure STD DEP 16.3-46 is acceptable.

- Table 16.1 COL Items 99 and 100

To be consistent with Departure STD DEP 16.3-16 and the description of the UHS system for STP Units 3 and 4 in FSAR Tier 2 Section 9.2.5, the applicant completes PTS 3.7.3 Action A and associated bases and SRs and associated bases by replacing bracketed references to "spray networks" with references to "cooling tower cells," "cooling tower," or "cooling tower division."

The applicant completes PTS SR 3.7.3.1 and bases by replacing "[spray pond]" with "basin," and by replacing "[ ] m" with "19.28 m" so that PTS SR 3.7.3.1 states, "Verify the water level in the UHS basin is ≥ 19.28 m."

The replacement site-specific information is acceptable because it is consistent with the description of the UHS system design for STP Units 3 and 4 in FSAR Tier 2 Section 9.2.5 and Section 9.2, Table 9.2-24. This change resolves Table 16.1 COL Items 99 and 100.

- Table 16.1 COL Items 101 and 102

To be consistent with Departure STD DEP 16.3-16, the applicant completes PTS SR 3.7.3.2, by replacing "[ ] m" with "0.91 m" so that PTS SR 3.7.3.2 states, "Verify the water level in the UHS basin is ≥ 0.91 m." The applicant likewise completes the associated bases so that the bases for PTS SR 3.7.3.2 state, "This SR verifies the water level in the UHS basin to be sufficient for the proper operation of the RSW pumps (net positive suction head and pump vortexing are considered in determining this limit)."

The applicant completes PTS SR 3.7.3.3 by replacing "[33.3]°C" with "32.2°C" so that PTS SR 3.7.3.3 states, "Verify the RSW water temperature at the inlet to the RCW/RSW heat exchangers is ≤ 32.2°C."

The replacement site-specific information is acceptable because it is consistent with the description of the UHS system design for STP Units 3 and 4 in FSAR Tier 2 Section 9.2.5 and Section 9.2, Table 9.2-24. This change resolves Table 16.1 COL Items 101 and 102.

Based on the above evaluation, PTS 3.7.3 and bases are acceptable.

### 16.4.10.4 *3.7.4 Control Room Habitability Area - Emergency Filtration (EF) System*

GTS 3.7.4 and bases are incorporated by reference into the PTS and bases with the following departures and no COL items:

- STD DEP 16.3-47 — LCO 3.7.4, Control Room Habitability Area (CHRA) – Emergency Filtration (EF) System

This departure revises GTS SR 3.7.4.4 and bases by replacing the specified flow rate of "360 $m^3$/h" with "3400 $m^3$/h" for the CRHA pressurization surveillance. This SR requires verification that each EF division can maintain a positive pressure of > 3.2 mm water gauge relative to the atmosphere during the isolation mode of operation at a flow rate of < 360 $m^3$/h. The revised flow rate of 3,400 $m^3$/h is consistent with ABWR DCD Tier 1 Table 2.15.5a, Item 5.b. Therefore, this change and STD DEP 16.3-47 are acceptable.

- STD DEP 16.3-48 — LCO 3.7.4, Control Room Habitability Area (CHRA) – Emergency Filtration (EF) System [bases only]

This departure clarifies the "Background" section of the bases for GTS 3.7.4 by revising the following sentence (as indicated by underlined and lined-out text) to reflect the CRHA-EF system design for STP Units 3 and 4, which includes two 100 percent capacity fans in each division.

> Each division consists of an electric heater, a prefilter, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section, a second HEPA filter, ~~a fan~~ <u>two 100% capacity fans</u>, and the associated ductwork and dampers.

Because this clarification does not change the intent of LCO 3.7.4, Departure STD DEP 16.3-48 is acceptable,

Based on the above evaluation, PTS 3.7.4 and bases are acceptable.

### 16.4.10.5 *3.7.5 Control Room Habitability Area - Air Conditioning (CRHA-AC) System*

GTS 3.7.5 and bases are incorporated by reference into the PTS and bases with the following departure and no COL items:

- STD DEP 16.3-76 — LCO 3.7.5, Control Room Habitability Area (CHRA) – Air Conditioning (AC) System [bases only]

This departure adds a bases discussion for GTS SR 3.7.5.2 that is consistent with the bases for similar GTS surveillances. This surveillance requires verifying that each CRHA AC division actuates on an actual or simulated initiation signal once per 18 months. The proposed bases for PTS SR 3.7.5.2 state:

> This SR verifies that each CRHA AC division starts and operates on a low flow signal from the operating Emergency Filtration Unit. The LOGIC SYSTEM FUNCTIONAL TEST in SR 3.3.7.1.4 overlaps this SR to provide complete testing of the safety function. The 18 month Frequency is appropriate since significant degradation of the CRHA AC System is not expected over this time period.

Because this paragraph is consistent with the STS and GTS bases for similar SRs, it is acceptable. Therefore, Departure STD DEP 16.3-76 is acceptable.

Based on the above evaluation, PTS 3.7.5 and bases are acceptable.

### 16.4.10.6 *3.7.6 Main Condenser Offgas*

GTS 3.7.6 and bases are incorporated by reference into the PTS and bases with the following departure and no COL items:

- STD DEP 16.3-75 — LCO 3.7.6, Main Condenser Offgas [bases only]

This departure corrects the “Background” section of the bases for GTS 3.7.6 (as indicated by underlined and lined-out text) by replacing “holdup line” with “charcoal adsorber vault” in the following sentence:

> The radioactivity of the remaining gaseous mixture (i.e., the offgas recombiner effluent) is monitored downstream of the moisture separator prior to entering the ~~holdup line~~ charcoal adsorber vault.

This change is acceptable because there is no holdup line in the description of the offgas system in ABWR DCD Section 11.3.4 or identified in DCD Figure 11.3-2, “Offgas System.” Therefore, Departure STD DEP 16.3-75 is acceptable.

Based on the above evaluation, PTS 3.7.6 and bases are acceptable.

### 16.4.10.7 *3.7.7 Main Turbine Bypass System*

GTS 3.7.7 and bases are incorporated by reference into the PTS and bases with no departures and the following COL item:

- Table 16.1 COL Item 103

The applicant completes the bases for PTS SR 3.7.7.3 by designating “FSAR Section 1.1.3” as the site-specific document containing the response time limits for the main-turbine-bypass-system instrumentation functions. This is acceptable as this SER describes in the discussion of

the applicant's response to **RAI 16-65 Issue 7** in the beginning of Section 16.4. Therefore, Table 16.1 COL Item 103 is resolved.

**RAI 16-12** concerns a typographical error in PTS 3.7.7 Required Action B.1. The applicant's response (dated August 10, 2009) states that this error will be corrected by restoring the action statement to match the GTS. The staff verified that Revision 4 of the COL application includes this correction. Therefore, **RAI 16-12** is resolved.

Based on the above, PTS 3.7.7 and bases are acceptable.

#### 16.4.10.8 *3.7.8 Fuel Pool Water Level*

GTS 3.7.8 and bases are incorporated by reference into the PTS and bases with no departures and no COL items. Therefore, PTS 3.7.8 and bases are acceptable.

Based on the above evaluation, PTS Section 3.7 and bases are acceptable.

### 16.4.11 PTS Section 3.8 – Electrical Power Systems

This PTS section has the following departures and COL items:

- STD DEP T1 2.12-2 I&C Power Divisions (bases only)
- STD DEP T1 3.4-1 Safety-Related I&C Architecture (bases only)
- STD DEP 8.3-1 Plant Medium Voltage Electrical System Design
- STP DEP 8.3-3 Electrical Site Specific Power and Other Changes (bases only)
- STD DEP 16.3-40 LCO 3.8.2, AC Sources-Shutdown (bases only)
- 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 16.3-49 LCO 3.8.1, AC Sources-Operating
- 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 (bases only)
- STD DEP 16.3-58 LCO 3.8.6, Battery Cell Parameters
- STD DEP 16.3-80 LCO 3.8.1, AC Sources-Operating (bases only)
- Table 16.1 COL Items 104 through 123

#### 16.4.11.1 *3.8.1 AC Sources - Operating*

GTS 3.8.1 and bases are incorporated by reference into the PTS and bases with the following departures and COL items:

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

The ABWR DCD provides a single 6.9 kV electrical system. This departure changes the medium-voltage electrical distribution system to a dual-voltage system consisting of 13.8 kV and 4.16 kV. See Section 8.3 of this SER for the evaluation of the design changes associated with this departure. This departure changes the following:

- The medium-voltage rating of the power generation (PG) buses increases to 13.8 kV.
- The medium-voltage rating of the plant investment protection (PIP) buses decreases to 4.16 kV.
- The medium voltage rating of the Class 1E buses decreases to 4.16 kV.
- The EDG ratings increase to 7,200 kW and 4.16 kV.
- The combustion turbine generator (CTG) ratings increase to 13.8 kV and at least to 20 MWe.
- The time required for the CTG to start and achieve steady-state voltage and frequency increases from two minutes to "less than 10 minutes," as required by RG 1.155 for a station blackout (SBO) alternate AC source.

Associated with this departure are changes to the GTS and bases that are incorporated into the PTS and bases, indicated by underlined text, as follows:

2. In PTS 3.5.1, "ECCS – Operating," the applicant addresses the ECCS requirements for operation. The NRC staff's review of this specification identified the departures described below:

> (Required Actions B.1.1 and C.1.1.1) Verify that the CTG is functional by verifying that the CTG starts and achieves steady-state voltage and frequency in <u>less than 10 minutes.</u>

The staff's review of the above subsection determined that the departures identified by the applicant relate to changes resulting from the type of equipment used, as described in STP FSAR Appendix 1C. The staff also found that the departures are consistent with 10 CFR 50.63 and the guidance of RG 1.155. Therefore, the staff found that the departures are appropriate and acceptable. This change resolves **RAI 16-4** and **RAI 16-7**, both of which asked for additional justification for the 10-minute CTG start time limit, and which the applicant had responded to in a letter dated August 10, 2009.

2. In PTS 3.8.1, "AC Sources – Operating," the applicant addresses the AC electrical power source requirements for operation. The staff's review of this specification identified the departures described below, as stated in Revision 3 of the COL application.

> (Required Actions A2, B3, C4, E1, and F1) Verify the CTG is functional by verifying that it starts and achieves steady-state voltage and frequency <u>in less than 10 minutes</u>.

(SR 3.8.1.2) Verify each DG starts from standby conditions and achieves steady-state voltage ≥ 3744 V and ≤ 4576 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz

(SR 3.8.1.3) Verify each DG is synchronized and loaded and operates for ≥ 60 minutes at a load ≥ 6480 kW and ≤ 7200 kW.

(SR 3.8.1.4) Verify each day tank contains ≥ 16,900 liters of fuel oil.

(SR 3.8.1.7) Verify each DG starts from standby conditions and achieves, in ≤ 20 seconds, voltage ≥ 3744 V and ≤ 4576 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.

(SR 3.8.1.9) Verify each DG operating at a power factor ≤ 0.9 rejects a load ≥ 589 kW for Division 1 and ≥ 1689 kW for Divisions 2 and 3 and:

a. Following load rejection, the frequency is ≤ 66.7 Hz
b. Within 3 seconds following load rejection, the voltage is ≥ 3744 V and ≤ 4576 V; and
c. Within 3 seconds following load rejection, the frequency is ≥ 58.8 Hz and ≤ 61.2Hz.

(SR 3.8.1.10) Verify each DG operating at a power factor ≤ 0.9 does not trip and voltage is maintained ≤ 4784 V during and following a load rejection of a load ≥ 6480 kW and ≤ 7200 kW.

(SR 3.8.1.11) Verify on an actual or simulated loss of offsite power signal: …

d. DG auto-starts from standby condition and: …

    3. maintains steady state voltage ≥ 3744 V and ≤ 4576 V

(SR 3.8.1.12) Verify on an actual or simulated Emergency Core Cooling System (ECCS) initiation signal each DG auto-starts from standby condition and: …

a. In ≤ 20 seconds after auto-start and during tests, achieves voltage ≥ 3744 V and ≤ 4576 V.

(SR 3.8.1.14) Verify each DG operating at a power factor ≤ 0.9 operates for ≥ 24 hours:

a. For ≥ 2 hours loaded, ≥ 7560 kW and ≤ 7920 kW

b. For the remaining hours of the test loaded ≥ 6480 kW and ≤ 7200 kW.

(SR 3.8.1.15 Note 1) This Surveillance shall be performed within 5 minutes of shutting down the DG after the DG has operated ≥ 2 hours loaded ≥ 6480 kW and ≤ 7200 kW. The staff issued **RAI 16-63** to point out that the values in GTS SR 3.8.1.15 Note 1 of "≥ 5225 kW and ≤ 5500 kW," which are based on SR 3.8.1.1.14 values for 2-hour loading ≥ 5225 kW and ≤ 5500 kW, should be

changed to "≥ 7560 kW and ≤ 7290 kW" in PTS SR 3.8.1.15 Note 1. The applicant's response (dated January 13, 2010) states that the load values in GTS SR 3.8.1.15 Note 1 are incorrect and proposes new Departure STD DEP 16.3-103 to address this error. The staff found this departure acceptable, as described later in this subsection. Because the proposed load values in PTS SR 3.8.1.15 Note 1 are correct, **RAI 16-63** is resolved.

(SR 3.8.1.15) Verify each DG starts and achieves, in ≤ 20 seconds, voltage ≥ 3744 V and ≤ 4576 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.

(SR 3.8.1.19) Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal: …

c. DG auto-starts from standby condition and: …

3. maintains steady state voltage ≥ 3744 V and ≤ 4576 V,

(SR 3.8.1.20) Verify that when started simultaneously from a standby condition, each Division 1, 2, and 3 DG achieves, in less than 20 seconds, voltage ≥ 3744 V and ≤ 4576 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.

The staff's review of the bases for PTS 3.8.1 identified the departures described below:

In various areas of the bases, the applicant changes the bus voltage level from 6.9 kV to 4.16 kV. This change is consistent with the plant-specific design of STP Units 3 and 4.

In referring to the reserve auxiliary transformers (RATs), the applicant changes the sentence from singular to plural. This change is consistent with the plant-specific design of STP Units 3 and 4 that utilizes two RATs instead of one.

In addressing the rating of the DG, the applicant states "The continuous service rating for each DG is 7200 kW at a 0.8 power factor with a 10 percent overload permissible for up to 2 hours in any 24-hour period." This information is consistent with the design specified in Subsection 8.3 of the STP Units 3 and 4 FSAR.

Pertaining to the CTG, the applicant states that it must be capable of "starting, accelerating to required speed and voltage, and of being manually configured to provide power to the ESF bus. This sequence must be accomplished in less than 10 minutes." This statement is consistent with other sections of the STP Units 3 and 4 FSAR. Additionally, the applicant states that the CTG is considered functional if it achieves a steady-state voltage ≥ 12.42 kV and ≤ 15.18 kV, and a frequency ≥ 56.8 Hz and ≤ 62.2Hz in less than 10 minutes. This information again is consistent with the plant-specific design of STP Units 3 and 4 and with industry standards.

In the "Surveillance Requirements" section of the bases for PTS 3.8.1, the applicant discusses motor and bus voltage ranges and states, "Where the SRs discussed herein specify voltage and frequency tolerances, the following

summary is applicable. The minimum steady state output voltage of 3744 V is 90% of the nominal 4.16 kV output voltage. This value, which is specified in ANSI C84.1 (Ref. 10), allows for voltage drop to the terminals of 4000 V motors whose minimum operating voltage is specified as 90%, or 3600 V. It also allows for voltage drops to motors and other equipment down through the 120 V level where minimum operating voltage is also usually specified as 90% of name plate rating. The specified maximum steady state output voltage of 4576 V is equal to the maximum operating voltage specified for 4000 V motors plus voltage drop from the source to the loads. It ensures that for a lightly loaded distribution system, the voltage at the terminals of 4000 V motors is no more than the maximum rated operating voltages. The specified minimum and maximum frequencies of the DG are 58.8 Hz and 61.2 Hz, respectively. These values are equal to ± 2% of the 60 Hz nominal frequency and are derived from the recommendations given in Regulatory Guide 1.9 (Ref. 3)." The departures in the above statement relate to the medium voltage selected by the applicant for the Class 1E ESF buses and equipment and are consistent with the plant-specific design of STP Units 3 and 4.

In the bases for SR 3.8.1.9, the applicant discusses load ratings and provides plant- specific load values as follows: "The load referenced for Division II and Division III DGs is the 1689 kW high pressure core flooder (HPCF) pump; for the Division I DG, the 589 kW residual heat removal (RHR) pump. The Reactor Service Water (RSW) system load was not used. Even though the load to the Division I DG is 1060 kW, that value consists of 2 RSW pumps of 530 kW each." The values provided are consistent with the values in FSAR Subsection 8.3.

The staff's review of PTS 3.8.1 and bases determined that the departures identified by the applicant relate to changes resulting from the type of equipment used, as described in FSAR Subsection 8.3. The staff also found that the departures are consistent with applicable requirements including 10 CFR 50.63, the guidance of RG 1.155 and RG 1.9, and the plant-specific design of STP Units 3 and 4. Therefore, the staff found that the departures are appropriate and acceptable.

3. In PTS 3.8.2, "AC Sources – Refueling," the applicant addresses the AC electrical power source requirements during refueling operations. The staff's review of this specification determined that in the LCO section of the bases, the applicant had changed the bus voltage level from 6.9 kV to 4.16 kV. This departure is consistent with the STP-specific plant design and is related to changes resulting from the type and equipment used, as described in STP FSAR Subsection 8.3. Therefore, the staff found that the departure is appropriate and acceptable.

4. In PTS 3.8.4, "DC Sources - Operating," the applicant addresses the DC electrical power source requirements with the unit operating in Mode 1, 2, or 3 and the surveillance requirements to confirm the operability of the sources. The staff's review of this subsection identified the departure described below.

   (Required Action A.3) Verify that the CTG is functional by verifying that the CTG starts and achieves steady-state voltage and frequency in less than 10 minutes.

Additionally, the applicant provides details about battery terminal voltage, connection resistance, and battery charger current requirements in SR 3.8.4.1, SR 3.8.4.2, SR 3.8.4.5, and SR 3.8.4.6 (Table 16.1 COL Items 119 and 120).

The staff's review of PTS 3.8.4 determined that the departures identified by the applicant relate to changes resulting from the type of equipment used, as described in STP FSAR Appendix 1C. The staff also verified that the plant-specific requirements pertaining to surveillance of the batteries and battery chargers (Table 16.1 COL Items 119 and 120). The staff's review also observed that the parameters discussed in this section are consistent with the guidance of IEEE Std 450. Therefore, the staff found that the departures are appropriate and acceptable.

5. In PTS 3.8.7, "Inverters – Operating," and PTS 3.8.8, "Inverters – Shutdown," the applicant addresses the requirements for the inverters in Modes 1, 2, 3, 4, and 5 and during the movement of irradiated fuel assemblies in secondary containment. The staff's review of these specifications determined that in the LCO section of the bases, the applicant has changed the bus voltage level from 6.9 kV to 4.16 kV, so that the bases state, "Each of the four inverters has a 125 V battery backup power source to ensure an uninterruptible supply of AC electrical power to the AC vital buses even if the 4.16 kV safety buses are de-energized." This information is consistent with the plant-specific design of STP Units 3 and 4. Therefore, the staff found that the departure is appropriate and acceptable.

6. In PTS 3.8.9, "Distribution System – Operating," the applicant addresses the electrical power distribution system required for operation. The staff's review of this specification identified the departure described below.

> (Required Actions A.2 and D.2) Verify that the CTG is functional by verifying that the CTG starts and achieves steady-state voltage and frequency in less than 10 minutes.

The staff's review of the bases for PTS 3.8.9 identified the departures described below.

> In the "Background" and "LCO" sections of the bases, the applicant changes the ESF bus voltage level from 6.9 kV to 4.16 kV. This change is consistent with the STP Units 3 and 4 plant-specific design.
>
> The applicant adds the following paragraph to the "Background" section of the bases. This paragraph describes the electrical power distribution for the reactor protection system/main steam isolation valve (RPS/MSIV) instrumentation and logic:
>
> > The RPS/MSIV logic and control in each of the four divisions use redundant power supplies, AC vital and AC instrument power. The 120 V AC instrumentation power buses A10/A20, B10/B20, C10/C20, and D10/D20 (Divisions I, II, III, and IV, respectively) are arranged in four load groups and are normally powered from a divisional 480 VAC motor control center (MCC) via a divisional Class 1E 480 V/120 V transformer powered from its divisional 480 V AC MCC. Again, with no fourth division of 480 V AC, the alternate power supply to the Division IV 120 V AC bus is a Division II 480 V AC MCC.

The design of the RPS/MSIV logic is consistent with the distribution system design, industry practices, and the guidance of RG 1.32. Therefore, the staff found that this paragraph is appropriate and acceptable.

The staff's review of PTS 3.8.9 and the bases determined that the departures identified by the applicant relate to changes resulting from the type of equipment used, as described in STP Units 3 and 4 FSAR Appendix 1C. The staff also found that the departures are consistent with 10 CFR 50.63 and the guidance of RG 1.155. Therefore, the staff found that the departures are appropriate and acceptable.

7. In PTS 3.8.11, "AC Sources – Shutdown (Low Water Level)," the applicant addresses the AC electrical power source requirements during shutdown in Mode 4 and Mode 5 with low water level conditions. The NRC staff's review of this specification and bases identified the following departures:

   (Required Action B.1) Verify that the CTG is functional by verifying the CTG starts and achieves steady-state voltage and frequency in less than 10 minutes.

   In the LCO section of the bases, the applicant changes the bus voltage level from 6.9 kV to 4.16 kV. This change is consistent with the plant-specific design of STP Units 3 and 4.

   In the bases for Required Action B.1, regarding verifying the availability of the CTG, the applicant states that the CTG is considered functional by verifying that it starts from standby conditions and achieves a steady-state voltage ≥ 12.42 kV and ≤ 15.18 kV, and a frequency ≥ 56.8 Hz and ≤ 62.2Hz in less than 10 minutes. This information again is consistent with the STP Units 3 and 4 plant-specific design and industry standards.

   The staff's review of PTS 3.8.11 and the bases determined that the departures identified by the applicant relate to changes resulting from the type of equipment used, as described in STP FSAR Appendix 1C. The staff also found that the departures were consistent with the requirements of 10 CFR 50.63 and the guidance of RG 1.155 and RG 1.9. Therefore, the staff found that the departures are appropriate and acceptable.

Based on the preceding evaluations, the changes to GTS 3.5.1, 3.8.1, 3.8.2, 3.8.4, 3.8.7, 3.8.9, and 3.8.11 as adopted in the PTS, which are associated with Departure STD DEP 8.3-1, are acceptable.

- STD DEP 16.3-49 LCO 3.8.1, AC-Sources-Operating

The applicant proposes to omit an incorrect reference to RG 1.9 Revision 3, from Note (b) in GTS Table 3.8.1-1, "Diesel Generator Test Schedule." Specifically, if the number of failures in the last 25 valid tests is ≥ 4, then the DG test frequency shall be 7 days [(b)] (but ≥ 24 hours). Note (b) states:

> This test frequency shall be maintained until seven consecutive failure free starts from standby conditions and load and run tests have been performed. This is consistent with Regulatory Position [ ], of Regulatory Guide 1.9, Revision 3. If, subsequent to the 7 failure free tests, 1 or more additional failures occur such

that there are again 4 or more failures in the last 25 tests, the testing interval shall again be reduced as noted above and maintained until 7 consecutive failure free tests have been performed.

The PTS omit the underlined sentence because RG 1.9 has no position regarding the seven consecutive failure-free starts. Because this change does not affect DG testing, this departure is acceptable.

- STD DEP 16.3-80 LCO 3.8.1, AC-Sources-Operating (bases only)

This departure repositions the title for Required Actions D.1 and D.2 after the bases for Required Actions C.4, C.5, and C.6 because of a typographical error. The error incorrectly positioned the title for Required Actions D.1 and D.2 within the text of the bases for Required Actions C.4, C.5, and C.6. Because this change is only an editorial correction, this departure is acceptable.

- STD DEP 16.3-103 SR 3.8.1.15, Note 1

The applicant proposed this departure in response to **RAI 16-63** to justify the DG load values in PTS SR 3.8.1.15 Note 1, which it proposed in Departure STD DEP 8.3-1. (See the above discussion of Departure STD DEP 8.3-1 in this subsection.) The departure also revises FSAR Section 16.3.8.1 to show that the change from a load equal to "105% to 110%" of the DG's continuous rating to a load equal to "90% to 100%" of the generator's continuous rating results from Departure STD DEP 16.3-103 rather than Departure STD DEP 8.3-1. The proposed load values of "≥ 6480 kW and ≤ 7200 kW" are acceptable because they satisfy the hot-restart test conditions of Section 2.2.10 of RG 1.9, Revision 3, "Selection, Design, Qualification, and Testing of Emergency Diesel Generator Units used as Class 1E Onsite Electric Power Systems at Nuclear Power Plants," Section 2.2.10 states that the test should be performed after the emergency diesel generator has operated for 2 hours at full load, not at the elevated 105% to 110% of continuous rating. The staff verified that Parts 2 and 7 of Revision 4 of the COL application include this departure. Therefore, Departure STD DEP 16.3-103 is acceptable.

- Table 16.1 COL Item 104

The applicant partially completes PTS SR 3.8.1.2, SR 3.8.1.7, SR 3.8.1.11, SR 3.8.1.12, SR 3.8.1.15, SR 3.8.1.19, and SR 3.8.1.20 by removing the brackets from the GTS bracketed frequency criteria of "≥ [58.8] Hz" and "≤ [61.2] Hz," which are the correct site-specific values. Therefore, this COL item is resolved.

- Table 16.1 COL Item 105

The applicant partially completes PTS SR 3.8.1.2, SR 3.8.1.7, SR 3.8.1.11, SR 3.8.1.12, SR 3.8.1.15, SR 3.8.1.19, and SR 3.8.1.20 by removing the brackets from the GTS bracketed voltage criteria of "≥ [6210] V" and "≤ [7590] V," and replacing the GTS values with the correct site-specific values of "≥ 3744 V" and "≤ 4576 V," which are based on STD DEP 8.3-1. Therefore, this COL item is resolved.

- Table 16.1 COL Item 106

The applicant partially completes PTS SR 3.8.1.3 by replacing the GTS bracketed power limits of "≥ 5000 kW and ≤ [ ] kW" and with the correct site-specific values of "≥ 6480 kW and

≤ 7200 kW," which are based on Departure STD DEP 8.3-1. In addition, the applicant completes the last paragraph of the Background section of the bases for PTS 3.8.1 by replacing the GTS value of "5000 kW" with the correct site-specific value of "7200 kW" for the diesel generator continuous service rating, which is also based on Departure STD DEP 8.3-1. Therefore, this COL item is resolved.

- Table 16.1 COL Item 107

The applicant completes PTS SR 3.8.1.4 by providing the correct calculated site-specific value of ≥ 16,900 liters for the required fuel oil volume in the day tank for each DG. Therefore, this COL item is resolved.

- Table 16.1 COL Item 108

The applicant completes PTS SR 3.8.1.8 by removing the brackets from the GTS, which states, "Verify manual transfer of the [unit power supply] from normal offsite circuit to each required alternate offsite circuit." The phrase, "unit power supply" is the correct site-specific nomenclature. Therefore, this COL item is resolved.

- Table 16.1 COL Item 109

The applicant completes PTS SR 3.8.1.9 by replacing GTS bracketed values with correct site-specific values for DG (a) loads to be rejected: Division 1, ≥ 589 kW, Divisions 2 and 3, ≥ 1689 kW; (b) frequency following load rejection, ≤ 66.7 Hz; and (c) voltage and frequency within 3 seconds after load rejection, ≥ 3744 V and ≤ 4576 V, and ≥ 58.8 Hz and ≤ 61.2 Hz. These values are based on Departure STD DEP 8.3-1. Therefore, this COL item is resolved.

- Table 16.1 COL Item 110

The applicant completes PTS SR 3.8.1.10 by replacing GTS bracketed values with correct site-specific values for verifying that each DG operating at a power factor ≤ 0.9 (a) does not trip, and (b) voltage is maintained ≤ 4784 V during and following a load rejection of a load ≥ 6480 kW and ≤ 7200 kW. These values are based on Departure STD DEP 8.3-1. Therefore, this COL item is resolved.

- Table 16.1 COL Item 111

The applicant completes PTS SR 3.8.1.14 by replacing GTS bracketed values with correct site-specific values for the load profile during the 24-hour DG load test to state:

> Verify each DG operating at a power factor ≤ 0.9, operates for ≥ 24 hours:
> a. For ≥ 2 hours loaded, ≥ 7560 kW and ≤ 7920 kW; and
> b. For the remaining hours of the test loaded ≥ 6480 kW and ≤ 7200 kW.

These values are based on Departure STD DEP 8.3-1. Therefore, this COL item is resolved.

- Table 16.1 COL Item 112

The sentence containing the placeholder for the site-specific information regarding a reference to regulatory positions in RG 1.9 in Note (b) of GTS Table 3.8.1-1, "Diesel Generator Test

Schedule," is omitted from PTS Table 3.8.1-1, as described in the evaluation of Departure STD DEP 16.3-49. Therefore, this COL item is resolved.

- Table 16.1 COL Item 113

The applicant completes the bases for PTS 3.8.1 Required Actions B.3, C.4, E.1, and F.1, based on STD DEP 8.3-1, by providing the correct site-specific performance start criteria for the combustion turbine generator (CTG) to achieve (a) steady-state voltage "≥ 12.42 kV and ≤ 15.18 kV," (b) steady-state frequency "≥ 58.8 Hz and ≤ 61.2 Hz," and (c) time period: in less than 10 minutes." Therefore, this COL item is resolved.

- Table 16.1 COL Item 114

The applicant completes the bracketed second paragraph of the Surveillance Requirements section of the bases for PTS 3.8.1 based on STD DEP 8.3-1, by removing the brackets and replacing GTS values with correct site-specific values in the bases discussion of voltage and frequency tolerances for AC sources. Specifically, the GTS value for the steady-state output voltage of 6210 V, which is 90% of the nominal 6900 V output voltage, is replaced by 3744 V, which is 90% of 4160 V. Instead of a 6600 V motor, the PTS bases reference a 4000 V motor with a minimum operating voltage of 90%, or 3600 V. The PTS bases also state that the 3744 V value allows for voltage drops to the motor and other equipment down through the 120 V level. The specified maximum steady-state output voltage changes to 4576 V, which is the maximum operating voltage specified for 4,000-V motors plus a voltage drop from the source to the loads. Therefore, this COL item is resolved.

- Table 16.1 COL Item 115

The applicant completes PTS SR 3.8.1.9 bracketed Notes 1 and 2 by removing the brackets because STP Units 3 and 4 do not plan to perform DG load rejection tests in Mode 1 or 2. The applicant also removes the associated reviewer's note in the bases for Note 1 in GTS SR 3.8.1.9 and SR 3.8.1.10. Therefore, PTS SR 3.8.1.9 Notes 1 and 2, associated bases, and the bases for PTS SR 3.8.1.10 Note 1 are acceptable. The staff verified that the bases for PTS SR 3.8.1.9, SR 3.8.1.10, SR 3.8.1.13, and SR 3.8.1.18 in Revision 4 of the COL application do not contain the reviewer's notes. These changes resolve Table 16.1 COL Item 115.

- Table 16.1 COL Item 116

The applicant completes the bases for PTS SR 3.8.1.13 Note 1 by removing the associated bracketed reviewer's note, because STP Units 3 and 4 do not plan to verify that DG automatic trips are bypassed on a loss of voltage signal concurrent with an ECCS initiation signal in Modes 1, 2, or 3. Therefore, PTS SR 3.8.1.13 Note 1 and associated bases are acceptable. The applicant completes the bases for PTS SR 3.8.1.18 Note 1 by removing the associated bracketed reviewer's note, because STP Units 3 and 4 do not plan to test DG load sequence timers in Modes 1, 2, or 3. Therefore, PTS SR 3.8.1.18 Note 1 and associated bases are acceptable. The staff verified that the bases for PTS SR 3.8.1.9, SR 3.8.1.10, SR 3.8.1.13, and SR 3.8.1.18 in Revision 4 of the COL application do not contain the reviewer's notes. These changes resolve Table 16.1 COL Item 116. .

*An additional RAI about PTS 3.8.1*

GTS LCO 3.8.1 requires two qualified AC electrical power source circuits between the offsite transmission network and the onsite Class 1E AC electrical power distribution system. This is based on one circuit utilizing the unit auxiliary transformer (UAT) and the other circuit utilizing the reserve auxiliary transformer (RAT). Each of the two required offsite circuits has a connection to each of the three 4.16 kV ESF buses. The LCO section of the bases for GTS 3.8.1 states:

> Offsite circuit OPERABILITY includes the normal offsite source [utilizing the UAT] supplying two of the three AC divisions and the alternate offsite source [utilizing the RAT] supplying the third AC division. Other configurations make an offsite circuit inoperable.

GTS 3.8.1 Action A addresses the condition of "One of the two offsite AC power sources to one engineered safety features (ESF) bus inoperable." The ACTIONS section of the bases explains that Condition A corresponds to an ESF bus with its associated UAT inoperable. Required Action A.1 allows 72 hours to verify that the affected ESF bus is powered from the other operable offsite AC circuit. In this case, that would be the circuit utilizing the RAT.

The staff issued **RAI 16-46** requesting the applicant to explain why the bases for PTS 3.8.1 Required Action A.1 should not be revised to address the condition of "One of the two offsite AC power sources to one engineered safety features (ESF) bus inoperable, "when the affected ESF bus is the one that is normally supplied by the RAT and not the UAT. The applicant's response to this RAI dated August 20, 2009 (ML092430075), proposes to revise the bases to clarify Condition A and Required Action A.1, as follows (as indicated by lined-out and underlined text):

> …The ESF bus with ~~its associated unit auxiliary transformer~~ <u>one of its offsite power sources</u> inoperable is verified to be energized from the offsite transmission network through ~~the reserve auxiliary transformer~~ <u>its other offsite power source</u> initially within 72 hours, and once per 8 hours thereafter,….

This change is acceptable because it clarifies that Condition A also applies to an inoperable required offsite power source to the ESF bus that is normally supplied by the RAT.

In addition, the applicant states that the two RATs are not physically independent of each other, but each is physically independent of the UAT. Therefore, either RAT may be designated as the alternate preferred offsite source normally aligned to one of the AC divisions. Because the two RATs are not physically independent of each other, requiring both RATs to be operable in LCO 3.8.1 is not warranted. The additional RAT provides operational flexibility beyond that required by GDC 17 but does not constitute a third independent offsite circuit. Based on the clarification in the bases and in the applicant's response, **RAI 16-46** is resolved. The staff verified that Revision 4 of the COL application, Parts 2 and 4 contains the proposed change to the bases for Action A of PTS 3.8.1. Part 2 appears to associate this bases change with Departure STD DEP 8.3-1; however the discussion of this departure in Part 7 does not specifically describe this bases change; it only states, "An additional reserve auxiliary transformer from off-site power will be included." Verification that the proposed bases changes are explicitly addressed in a standard departure in Parts 2 and 7 of a future revision of the COL application is being tracked as **Confirmatory Item 16-46**.

Based on the preceding evaluation, PTS 3.8.1 and bases are acceptable.

### 16.4.11.2 *3.8.2 AC Sources - Refueling*

GTS 3.8.2 and bases are incorporated by reference into the PTS and bases with the following departures and no COL items:

- STD DEP 8.3-1 — Plant Medium Voltage Electrical System Design [bases only]

See the evaluation of this departure in Subsection 16.4.11.1.

- STD DEP 16.3-40 — LCO 3.8.2, AC Sources-Shutdown [bases only]

In the LCO section of the bases for PTS 3.8.2, the applicant addresses the AC sources required during refueling, as stated below. The underlined text indicates the change of this departure to the following paragraph in the bases:

> Each DG must also be capable of accepting required loads within the assumed loading sequence intervals, and must continue to operate until offsite power can be restored to the ESF buses. These capabilities are required to be met from a variety of initial conditions such as: DG in standby with the engine hot, <u>DG in standby with engine at ambient conditions</u>, and DG operating in parallel test mode.

The NRC staff's review of the above subsection determined that the departure involves the addition of "DG in standby with engine at ambient conditions" in the last sentence for consistency with the bases for PTS 3.8.1 and PTS 3.8.11. The staff also found that the departure is consistent with the guidance of RG 1.9. Therefore, the staff concluded that the departure is appropriate and acceptable.

- STD DEP 16.3-41 — LCO 3.8.2, AC Sources-Shutdown

The Note for the required actions of Condition A in GTS 3.8.2 states:

> Enter applicable Condition and Required Actions of LCO 3.8.10, with one required division de-energized as a result of Condition B.

The departure corrects the referenced Condition from B to A, which is consistent with GDC 17 and the guidance of RG 1.32. The staff therefore concluded that the departure is acceptable.

Based on the above evaluation, PTS 3.8.2 and bases are acceptable.

### 16.4.11.3 *3.8.3 Diesel Fuel Oil, Lube Oil, and Starting Air*

GTS 3.8.3 and bases are incorporated by reference into the PTS and bases with the following departure and COL items:

- STD DEP 16.3-51 — LCO 3.8.3, Diesel Fuel Oil, Lube Oil, and Starting Air

The "Background" section of the bases for GTS 3.8.3 states that "Each [diesel generator] DG has an air start system with adequate capacity for five start attempts on the DG without

recharging the air start receiver(s)." The actual design of the ABWR and STP Units 3 and 4 includes two redundant DG air start subsystems. Each subsystem has an adequate capacity for five successive start attempts on the DG without recharging the air start receiver(s). This departure changes Condition E of GTS 3.8.3 so that PTS 3.8.3 Condition E accounts for this redundancy, as follows (as indicated by the underlined and lined-out text):

> One or more DGs with pressure in at least one starting air receiver < 3,000 kPaG and ≥ 2,700 kPaG.

This departure also revises the bases for GTS 3.8.3, so that the "Background" section of the bases for PTS 3.8.3 states:

> Each DG has ~~an~~ redundant air start subsystems, each with adequate capacity for five successive start attempts on the DG without recharging the air start receiver(s). One subsystem with an OPERABLE air start receiver satisfies OPERABILITY requirements for its associated DG.

In addition, the "LCO" section of the bases of PTS 3.8.3 states,

> The starting air system is required to have a minimum capacity for five successive DG start attempts without recharging the air start receivers. One subsystem with an OPERABLE air start receiver satisfies OPERABILITY requirements for its associated DG.

This departure is acceptable because it makes PTS 3.8.3 and bases consistent with the design of the ABWR and STP Units 3 and 4, which includes two starting air subsystems for each DG.

- Table 16.1 COL Item 117

The applicant completes PTS 3.8.3 and bases by providing the correct values of < 380,000 liters and ≥ 350,000 liters for the DG fuel oil storage tank level for each DG in Condition A and SR 3.8.3.1, the correct values of < 7,300 liters and ≥ 6,700 liters for the lube oil inventory for each DG in Condition B and SR 3.8.3.2, the correct values of < 3,000 kPaG and ≥ 2,700 kPaG for the pressure in at least one starting air receiver for each DG in Condition E, Required Action E.1, and SR 3.8.3.4. The applicant states that these values were obtained by calculation. The staff issued **RAI 16-40** requesting the applicant to verify that the specified quantity of stored lube oil (7,300 liters) accounts for a 10 percent margin above the 7-day guideline, as stated in ANSI/ANS 59.52–1988. The applicant's response to this RAI dated August 20, 2009, states the following:

> The calculation for the 7-day lube oil supply does not include a specific 10% margin per ANSI/ANS 59.52.1988. However, a greater than 10% margin is accounted for by specifying an assumed lube oil consumption value of 0.0023 kg/kw h, whereas, the engineering procurement document specifies a lube oil consumption rate of ≤ 0.001 kg/kw h, providing a 130% margin. The calculation also accounts for dead stock of 1520 liters and adds an additional 532 liters for immediate fluid level drop following a DG start. Thus, the 10% margin specified in ANSI/ANS 59.52.1988 is accounted for.

This response resolves RAI **16-40** and Table 16.1 COL item 117.

- Table 16.1 COL Item 118

The applicant completes the bases for PTS SR 3.8.3.3, in part, by providing the correct ASTM references for new fuel oil testing in the response to **RAI 16-41** dated August 20, 2009. These ASTM standard references, which are also listed in Reference 6 of the bases for PTS 3.8.3, are as follows:

- ASTM D4057–06
- *ASTM D975–09
- *ASTM D4176–04e1
- *ASTM D1552–08
- ASTM D2622–08
- ASTM D2276–06

The applicant completes the remaining part of the bases for SR 3.8.3.3 by removing the brackets from the acceptance criteria for new fuel properties stated in the bases for GTS SR 3.8.3.3. These criteria, which are for the tests specified in ASTM D975-09, are absolute specific gravity at 15.6/15.6 °C of ≥ 0.83 and ≤ 0.89 (or API gravity at 15.6 °C of ≥ 27 and ≤ 39), a kinematic viscosity at 40 °C of ≥ 1.9 $mm^2/s$ and ≤ 4.1 $mm^2/s$, and a flash point of ≥ 51.7 °C. The staff verified that Revision 4 of the COL application incorporates the three ASTM references, denoted by an asterisk in the above list. The information in the applicant's response and in Revision 4 of the COL application resolves Table 16.1 COL Item 118 and **RAI 16-41**.

Based on the preceding evaluation, PTS 3.8.3 and bases are acceptable.

### 16.4.11.4 *3.8.4 DC Sources - Operating*

GTS 3.8.4 and bases are incorporated by reference into the PTS and bases with the following departures and COL items:

- STD DEP T1 3.4-1 Safety-Related I&C Architecture [bases only]

See Chapter 7 and Subsection 16.4.6.1 of this SER for the evaluation of this departure.

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

See the evaluation of this departure in Subsection 16.4.11.1.

- STD DEP 16.3-42 LCO 3.8.4, DC Sources - Operating [bases only]

The "Actions" section of the bases for PTS 3.8.4 omits the GTS phrase "for Required Actions A.1, B.2, C.1, and C.2" in the initial sentence of the bases for Required Actions D.1 and D.2, as follows (with the omitted phrase lined out):

> If all inoperable DC electrical power subsystems cannot be restored to OPERABLE status within the associated Completion Times ~~for Required Actions A.1, B.2, and C.1 or C.2,~~ the unit must be brought to a MODE in which the LCO does not apply.

However, the staff concluded that this change does not make the bases fully consistent with Condition D, which states, "Required Action and associated Completion Time not met." This is

because the phrase “If all inoperable DC electrical power subsystems cannot be restored to OPERABLE status within the associated Completion times” would not apply to all of the Required Actions in Condition A. The staff issued **RAI 16-52** requesting the applicant to revise the bases for Required Actions D.1 and D.2 to be consistent with PTS 3.8.4 Condition D. In the response to this RAI dated September 8, 2009 (ML092530687), the applicant withdrew the proposed changes to the bases for Required Actions D.1 and D.2. However, the affected statement in the bases for GTS 3.8.4 Action D is still inconsistent with Actions A, B, and C. The staff closed **RAI 16-52** for tracking purposes and issued supplemental **RAI 16-64** to request the applicant to clarify the bases for Action D again in Departure STD DEP 16.3-42. The applicant’s response to RAI 16-64 dated January 13, 2010 (ML100141738), revises the departure so that the initial sentence of the bases for Required Actions D.1 and D.2 states:

> The unit must be brought to a MODE in which the LCO does not apply if any Required Action of Condition A or B is not met within its associated Completion Time, or if Condition C is not met within its associated Completion Time, while a DC electrical power subsystem remains inoperable.

This change provides the requested clarification and resolves **RAI 16-64**. The staff verified that Revision 4 of the COL application includes this change. Therefore, Departure STD DEP 16.3-42 is acceptable.

- Table 16.1 COL Item 119

The applicant completes PTS SR 3.8.4.1, to verify battery terminal voltage is ≥ 130 V on float charge, by providing the correct site-specific value, which is consistent with the minimum float voltage requirements of all three major domestic suppliers of safety-related batteries. This value is therefore acceptable.

The applicant completes PTS SR 3.8.4.2, by providing the correct site-specific value as indicated by underlined text, as follows: “Verify no visible corrosion on terminals and connectors OR verify connection resistance is ≤ 20% above the resistance as measured during installation of the battery for inter-cell, inter-rack, inter tier, and terminal connections.” This value is consistent with the values and limits described in IEEE 450 that are used by all three major domestic suppliers of safety-related batteries, and is therefore acceptable.

The applicant completes PTS SR 3.8.4.5 by providing the correct site-specific value as indicated by underlined text, as follows: “Verify connection resistance is ≤ 20% above the resistance measured during installation of the battery for inter-cell, inter-rack, inter-tier, and terminal connections. This value is consistent with the values and limits described in IEEE Std 450 that are used by all three major domestic suppliers of safety-related batteries, and is therefore acceptable.

The staff verified that Revision 4 of the COL application includes the proposed underlined information. Therefore, Table 16.1 COL Item 119 is resolved.

- Table 16.1 COL Item 120

The applicant completes PTS SR 3.8.4.6, by providing the correct site-specific value as indicated by underlined text, as follows: “Verify each required battery charger supplies ≥ 600 amps at ≥ 125 V for ≥ 12 hours.” This value is acceptable because a 600-amp battery charger

is used at STP Units 3 and 4. The staff verified that Revision 4 of the COL application includes the proposed underlined information. Therefore, Table 16.1 COL Item 120 is resolved.

Based on the above, PTS 3.8.4 and bases are acceptable.

### 16.4.11.5 *3.8.5 DC Sources – Shutdown*

GTS 3.8.5 and bases are incorporated by reference into the PTS and bases with no departures and no COL items. Therefore, PTS 3.8.5 and the bases are acceptable.

### 16.4.11.6 *3.8.6 Battery Cell Parameters*

GTS 3.8.6 and bases are incorporated by reference into the PTS and bases with the following departure and COL items.

- STD DEP 16.3-58 LCO 3.8.6, Battery Cell Parameters

This departure clarifies Condition A of GTS 3.8.6 by adding the following underlined phrase:

> One or more batteries with one or more battery cell parameters not within Table 3.8.6-1 Category A or B limits.

The applicant explains that this clarification is needed because Condition B addresses the condition of "One or more batteries with one or more battery cell parameters not within Category C limits." Because this clarification does not change the intent or meaning of Condition A, this departure is acceptable.

- Table 16.1 COL Item 121

The applicant completes PTS SR 3.8.6.2, "Verify that battery cell parameters meet Table 3.8.6-1 Category B limits," by providing the correct voltage limits in the second and third Frequencies. The second Frequency is "Once within 24 hours after battery discharge < 110 V." This value is acceptable because it is consistent with the battery used. The third Frequency is "Once within 24 hours after battery overcharge > 140 V." This value is acceptable because it is consistent with the specified battery voltage range of 105 V to 140 V. The staff verified that Revision 4 of the COL application includes the proposed information. Therefore, Table 16.1 COL Item 121 is resolved.

- Table 16.1 COL Item 122

The applicant completes PTS Table 3.8.6-1, "Battery Cell Parameter Requirements," by providing the correct site-specific values for specific gravity and related float current. See the evaluation of **RAI 16-21 Issue 21** in the beginning of Section 16.4 of this SER. The staff confirmed that these values are incorporated into Revision 3 of the COL application. This COL item is therefore resolved.

Based on the above, PTS 3.8.6 and bases are acceptable.

### 16.4.11.7 *3.8.7 Inverters - Operating*

GTS 3.8.7 and bases are incorporated by reference into the PTS and bases with the following departure and no COL items:

- STD DEP 8.3-1 Plant Medium Voltage Electrical System Design [bases only]

See the evaluation of this departure in Subsection 16.4.11.1.

Based on the above evaluation, PTS 3.8.7 and bases are acceptable.

### 16.4.11.8 *3.8.8 Inverters - Shutdown*

GTS 3.8.8 and bases are incorporated by reference into the PTS and bases with the following departures and no COL item:

- STD DEP 8.3-1 Plant Medium Voltage Electrical System Design [bases only]

See the evaluation of this departure in Subsection 16.4.11.1.

- STD DEP 16.3-52 LCO 3.8.8, Inverters – Shutdown [bases only]

The applicant replaces the phrase “the Reactor Protection System (RPS) and Emergency Core Cooling Systems (ECCS) instrumentation and Controls” with “Class 1E constant voltage constant frequency (CVCF) loads” in the “Applicable Safety Analyses” section and the “LCO” section of the bases for PTS 3.8.8, “Inverters – Shutdown,” so that the PTS bases state (respectively):

> The inverters are designed to provide the required capacity, capability, redundancy, and reliability to ensure the availability of necessary power to Class 1E constant voltage constant frequency (CVCF) loads so that the fuel, Reactor Coolant System, and containment design limits are not exceeded.
>
> The inverters ensure the availability of AC electrical power for the Class 1E CVCF loads required to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence or postulated DBA.

The staff found that these changes in nomenclature are consistent with the guidance of RG 1.32. The departure is therefore reasonable and acceptable.

Based on the above, PTS 3.8.8 and bases are acceptable.

### 16.4.11.9 *3.8.9 Distribution Systems - Operating*

GTS 3.8.9 and bases are incorporated by reference into the PTS and bases with the following departures and no COL items:

- STD DEP T1 2.12-2 I&C Power Divisions [bases only]

Table B 3.8.9-1, "AC, DC, and AC Vital Bus Electrical Power Distribution System," in the bases for GTS 3.8.9, "Distribution System - Operating," lists by identification number the following distribution system buses:

- AC buses
  - 6900 V ESF buses (3 – M/C E, F, and G)
  - 480 V power centers (6 – P/C E10, F10, G10, E20, F20, and G20)
  - 480 V motor control centers (18 – C/B E110 through E113, E120, and E260; F110 through F113, F120, and F260; G110 through G113, E120, and G260)
  - 120 V distribution panels (6 – IP A10, B10, C10, A20, B20, and C20)

- DC buses
  - 125 V motor control center (1 – DC MCC A1)
  - 125 V distribution panels (8 – DC A10, B10, C10, D10**, A20, B20, C20, and D20**)

- AC Vital buses
  - 120 V constant voltage, constant frequency distribution panels (8 – A11, B11, C11, D11***, A21, B21, C12, and D12***)

This departure revises this table so that Table B 3.8.9-1 of the bases for PTS 3.8.9 lists by identification number the distribution system buses for STP Units 3 and 4, consistent with the design of STP Units 3 and 4 (changes indicated by underlined text) as follows:

- AC buses
  - 4.16 kV ESF buses (3 – M/C A3, B3, and C3)
  - 480 V power centers (6 – P/C E10, F10, G10, E20, F20, and G20)
  - 480 V motor control centers (21 – MCC E110 through E114, E120, E121 and E260; F110 through F114, F120, F121 and F260; G110, G111, G120, G121 and G260)
  - 120 V distribution panels (8 – IP A10, B10, C10, D10***, A20, B20, C20 and D20***;

- DC buses
  - 125 V motor control center (1 – DC MCC A1)
  - 125 V distribution panels (8 – DC A10, B10, C10, D10**, A20, B20, C20, and D20**)

- AC Vital buses
  - 120 V constant voltage, constant frequency distribution panels (8 – A11, B11, C11, D11***, A21, B21, C21, and D21***)

In addition, table footnote ***, which applies to 120 V distribution panels and AC Vital buses in Division IV, is revised as follows as indicated by underlined text:

> The normal power source for the Division 4 AC vital and AC instrument power bus subsystems is a Division 2 480 V AC motor control center.

Note that the DC buses associated with Footnote ** are not changed. The change from 6900 V to 4.16 kV for the ESF buses is justified under Departure STD DEP 8.3-1.

The NRC 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. See Chapter 8 of this SER for the evaluation of design changes that are associated with Departure STD DEP T1 2.12-2 regarding the number and configuration of distribution buses and panels.

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

See the evaluation of this departure in Subsection 16.4.11.1.

- STP DEP 8.3-3 Electrical Site Specific Power and Other Changes [bases only)]

As discussed in the associated Departure STD DEP 8.3-1, the applicant revises the medium voltage electrical distribution system. Site-specific changes associated with this departure are required to accommodate the new arrangements and electrical loads. These departures include changes to ABWR DCD Section 8.3 regarding DG loadings and electrical power distribution drawings, as follows.

- Table 8.3-1 was updated to identify the site-specific changes (i.e., cooling tower fans, UHS, HECW refrigerators, and MCCs) as a result of performing load study calculations and DG and CTG sizing calculations.

- Figure 8.3-1, Sheets 1-4, is revised to incorporate site-specific load changes that were identified during the process of performing load study calculations, diesel generator sizing, and CTG sizing calculations.

Because of this design change, PTS bases Table B 3.8.9-1, "AC, DC, and AC Vital Bus Electrical Power Distribution System," is also changed to show the AC bus changes (i.e., MCC changes). See the above evaluation of Departure STD DEP T1 2.12-2 for additional details of changes incorporated into PTS bases Table B 3.8.9-1. See Section 8.3 of this SER for the evaluation of Departures STD DEP T1 2.12-2 and STP DEP 8.3-3 regarding the design changes that necessitated this departure. Based on these evaluations, the changes incorporated into PTS bases Table B 3.8.9-1, as proposed in Departure STP DEP 8.3-3, are acceptable.

Based on the above evaluations, PTS 3.8.9 and bases are acceptable.

### 16.4.11.10 *3.8.10 Distribution Systems - Shutdown*

GTS 3.8.10 and bases are incorporated by reference into the PTS and bases with no departures and no COL items. Therefore, PTS 3.8.10 and bases are acceptable.

### 16.4.11.11 *3.8.11 AC Sources - Shutdown (Low Water Level)*

GTS 3.8.11 and bases are incorporated by reference into the PTS and bases with the following departure and COL item:

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

See the evaluation of this departure in Subsection 16.4.11.1.

- Table 16.1 COL Item 123

The applicant completes the bases for PTS 3.8.11 Required Action B.1 by providing the performance criteria for a functional CTG and steady-state voltage and frequency that are consistent with Departure STD DEP 8.3-1 and are within 10% nominal voltage and 2% nominal frequency. Although not specifically stated, these industry-accepted criteria are derived from RG 1.9, Section C.1.4, and are therefore acceptable. This information resolves Table 16.1 COL Item 123.

Based on the above, PTS 3.8.11 and bases are acceptable.

Based on the above evaluation, PTS Section 3.8 and bases are acceptable.

### 16.4.12 PTS Section 3.9 – Refueling Operations

This PTS section has the following departures and one COL item:

- STD DEP 7.7-10 — Control Rod Drive Control System Interfaces [bases only]
- STD DEP 7.7-18 — Rod Control and Information System Operator Information [bases only]
- STD DEP 16.3-9 — LCO 3.4.7 Alternate Decay Heat Removal [bases only]
- STD DEP 16.3-12 (withdrawn) — LCO 3.9.7, Residual Heat Removal Flow Path [bases only]
- STD DEP 16.3-13 — LCO 3.9.8, Residual Heat Removal (RHR) - “Low Water Level” Applicability [bases only]
- STD DEP 16.3-14 — LCO 3.9.2, Refuel Position Rod-Out Interlock [bases only]
- STD DEP 16.3-15 — LCO 3.9.5, Control Rod OPERABILITY - Refueling
- STD DEP 16.3-25 — LCO 3.9.1, Refueling Equipment Interlocks
- STD DEP 16.3-35 — LCO 3.9.6, Reactor Pressure Vessel (RPV) Water Level [bases only]
- Table 16.1 COL Item 124

#### 16.4.12.1 *3.9.1 Refueling Equipment Interlocks*

GTS 3.9.1 and bases are incorporated by reference into the PTS and bases with the following departure and no COL items:

- STD DEP 16.3-25 — LCO 3.9.1, Refueling Equipment Interlocks

This departure clarifies that the refueling equipment interlocks are required to be operable with the reactor mode switch in the refuel position. GTS LCO 3.9.1 requires the refueling equipment interlocks to be operable during in-vessel fuel movement with equipment associated with the interlocks. The three refueling equipment interlocks (all-rods-in, refueling machine position, and

refueling machine main hoist fuel loaded) are only applicable when the reactor mode switch is in the refuel position. However, the "Background" section of the bases for GTS 3.9.1 states,

> With the reactor mode switch in the shutdown or refueling position, the indicated conditions are combined in logic circuits to determine if all restrictions on refueling equipment operations and control rod insertion are satisfied.

This statement incorrectly implies that this instrumentation is also applicable when the reactor mode switch is in the shutdown position. Accordingly, this departure revises GTS 3.9.1 and the bases to clarify in the PTS and bases when the refueling equipment interlocks are required to be operable. These changes are:

- Remove "shutdown or" from the bases sentence quoted above.
- Change the LCO so that PTS LCO 3.9.1 states, "The refueling equipment interlocks associated with the reactor mode switch in the refuel position shall be OPERABLE."
- Change the Applicability of PTS 3.9.1 to state, "During in-vessel fuel movement with equipment associated with the interlocks when the reactor mode switch is in the refuel position."

These changes are acceptable because the reactor mode switch shutdown position requirements in PTS 3.3.5.1 ensure the operability of control rod block functions. This departure is acceptable because it is an editorial clarification to the applicability of the refueling equipment interlocks operability requirement.

Based on the above evaluation, PTS 3.9.1 and bases are acceptable.

### 16.4.12.2 *3.9.2 Refuel Position Rod - Out Interlock*

GTS 3.9.2 and bases are incorporated by reference into the PTS and bases with the following departure and no COL items:

- STD DEP 16.3-14 — LCO 3.9.2 Refuel Position Rod - Out Interlock (bases only)

The "Applicability" section of the bases for GTS 3.9.2 refers to LCO 3.1.2, "Reactivity Anomalies," when referring to control rods. The appropriate LCO is 3.1.3, "Control Rod OPERABILITY." This departure corrects an editorial error and is therefore acceptable.

Based on the above evaluation, PTS 3.9.2 and bases are acceptable.

### 16.4.12.3 *3.9.3 Control Rod Position*

GTS 3.9.3 and bases are incorporated by reference into the PTS and bases with the following departure and no COL items:

- STD DEP 7.7-18 — Rod Control and Information System Operator Information [bases only]

This departure revises the "Background" section of the bases for GTS 3.9.3 by changing the description of the manner in which the RCIS is placed in the Scram Test Mode. The GTS bases reference the use of an RCIS "Rod Test Switch" to allow two control rods to be withdrawn for scram testing during refueling. This "Rod Test Switch" is placed in the Scram Test Mode through the use of the RCIS Dedicated Operators Interface (DOI) panel (i.e., the switch is now a touch panel button). The "Background" section of the bases for GTS 3.9.3 states the following:

> However, during refueling, the RCIS "Rod Test Switch" allows two control rods to be withdrawn for scram testing.

The departure replaces this sentence with the following sentence in the bases for PTS 3.9.3:

> However, during refueling, the RCIS is placed in the scram test mode which allows two control rods to be withdrawn for scram testing.

The departure proposes a change that consists only of rewording for clarification to be consistent with the design of the operator interface for STP Units 3 and 4, and thus does not change the meaning or intent of the original bases of GTS 3.9.3. Therefore, Departure STD DEP 7.7-18 is acceptable as it relates to the PTS 3.9.3. See Section 7.7 of this SER for an additional evaluation of this departure.

Based on the above evaluation, PTS 3.9.3 and bases are acceptable.

### 16.4.12.4 *3.9.4 Control Rod Position Indication*

GTS 3.9.4 and bases are incorporated by reference into the PTS and bases with the following departure and no COL items:

- STD DEP 7.7-10 — Control Rod Drive Control System Interfaces [bases only]

This departure implements a revision to the description of the alternate methods for verifying the rod full-in position in the bases for GTS 3.9.4 Action A, for the condition of one or more required control rod "full-in" position indication channels inoperable. The alternate method associated with the proposed change to the bases uses the synchros to verify rod full-in position. Specifically, the third paragraph of the bases for Required Actions A.1.1, A.1.2, A.1.3, A.2.1, and A.2.2 is revised as follows with changes indicated by lined-out and underlined text:

> Under these conditions, 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% position indication). Another option is to bypass Synchro A ~~(which is the current position probe) and use~~ or Synchro B <u>so that the OPERABLE synchro providing rod position data to both channels of the RCIS is used</u>. If the readings of the two Synchros do not agree, the conditions will be alarmed to the operator to initiate bypass. ~~of Synchro A and to use Synchro B.~~

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.

The above changes, which are incorporated into the bases for PTS 3.9.4 in Revision 3 of the COL application, are acceptable because they are consistent with the changes in the design descriptions of the synchro-to-digital converters (SDCs) and the fine motion control rod drives (FMCRDs) in FSAR Subsection 7.7.1.2.1. This FSAR subsection describes the rod control and information system (RCIS) interfaces with the CRD control system for single rod movement. Section 7.7 of this SER provides the staff's evaluation of the changes to DCD Tier 2 Subsection 7.7.1.2.1 proposed in this departure. Therefore, the changes made by Departure STD DEP 7.7-10 and incorporated into the bases of PTS 3.9.4 are acceptable.

Based on the preceding evaluation, PTS 3.9.4 and bases are acceptable.

### 16.4.12.5 *3.9.5 Control Rod OPERABILITY - Refueling*

GTS 3.9.5 and bases are incorporated by reference into the PTS and bases with the following departure and COL item:

- STD DEP 16.3-15 LCO 3.9.5, Control Rod OPERABILITY – Refueling

This departure changes the accumulator pressure in PTS SR 3.9.5.2 from the GTS value of 10.49 MPaG to 12.75 MPaG to be consistent with the bases. A lower pressure in the accumulators has not been determined for the ABWR design. This pressure is consistent with the pressure in PTS 3.1.5, "Control Rod Scram Accumulators," in Modes 1 and 2 and is therefore acceptable. In **RAI 16-16,** the staff asked the applicant to replace the greater than symbol with the greater than or equal to symbol in the "LCO" section of the bases for GTS 3.9.5 for consistency with the condition for the minimum scram accumulator pressure in other parts of the GTS and bases. The applicant's response (dated August 18, 2009) states that Revision 4 of the COL application will correct this error as an editorial change in a new standard departure. The staff verified that Revision 4 of the COL application, Parts 2, 4, and 7, include the editorial correction to the bases for PTS 3.9.5 as part of Departure STD DEP 16.3-97. Based on this response and providing the correct value for the minimum pressure in the scram accumulator, Departure STD DEP 16.3-15 and **RAI 16-16** are resolved.

In **RAI 16-22** the staff requested the applicant to provide an explanation for the difference between the accumulator pressure of 12.75 MPaG in the bases for GTS 3.9.5 and the "required" value of 14.71 MPaG in ABWR DCD Subsection 4.6.1.2.4. The staff also asked the applicant to include the derivation of the 12.75 MPaG value. The applicant's response to this RA dated August 18, 2009, states:

> The CRD Hydraulic Control Unit (HCU) Equipment Requirement Specification assumes an accumulator pressure of 12.71 MPaG (1842 psig) to ensure that the HCUs can produce the required CRD scram times. The design value of 14.71 MPaG, provided in DCD subsection 4.6.1.2.4, is the discharge pressure at

the rated operational point on the CRD pump curve, and provides assurance that the Technical Specification required pressure of 12.75 MPaG can be met. The HCU pressure switch [alarm setting] is set above the TS limit, but below the design limit.

The staff found this response acceptable. Therefore, **RAI 16-22** is resolved.

- Table 16.1 COL Item 124

The applicant completes PTS SR 3.9.5.2 and bases by providing the correct pressure value of ≥ 12.75 MPaG for the scram accumulator for each withdrawn control rod. This information resolves this COL item.

Based on the above, PTS 3.9.5 and bases are acceptable.

### 16.4.12.6 *3.9.6 Reactor Pressure Vessel (RPV) Water Level*

GTS 3.9.6 and bases are incorporated by reference into the PTS and bases with the following departure and no COL items:

- STD DEP 16.3-35 LCO 3.9.6, RPV Water Level (bases only)

In the "Applicable Safety Analyses" section of the bases for GTS 3.9.6, "dropped fuel" is changed to "damaged fuel" to more accurately describe the accident results and terminology of the analyses in DCD Subsection 15.7.4. In addition, the specification reference to LCO 3.7.6, "Fuel Pool Water Level," is corrected to LCO 3.7.8. Because these are justified editorial changes, this departure is acceptable.

Based on the above, PTS 3.9.6 and bases are acceptable.

### 16.4.12.7 *3.9.7 Residual Heat Removal (RHR) - High Water Level*

GTS 3.9.7 and bases are incorporated by reference into the PTS and bases with the following departures and no COL items:

- STD DEP 16.3-9 LCO 3.4.7 Alternate Decay Heat Removal (bases only)

See the evaluation of this departure in Subsection 16.4.7.7 of this SER.

- STD DEP 16.3-12 (withdrawn) LCO 3.9.7, Residual Heat Removal Flow Path (bases only)

The "Background" section of the bases for GTS 3.9.7 and GTS 3.9.8 describe the flow path of the RHR shutdown cooling system to the reactor pressure vessel. Regarding RHR Subsystems B and C, the bases state that each pump discharge to the reactor is via the "RHR inlet nozzles." The applicant proposes to change this information in the PTS bases to state, "RHR low pressure flooder spargers," which, according to the applicant, is consistent with the design and the bases for GTS/PTS 3.4.7 and 3.4.8. The staff reviewed the Tier 1 and Tier 2 information concerning the RHR shutdown cooling system in the ABWR DCD, including the RHR P&IDs and physical Figures 20.3.4-5 a&b, "Low Pressure Core Flooder Sparger,"

(Sheets 1 and 2) in ABWR DCD Chapter 21. However, the staff could not find information to support this change. The staff issued **RAI 16-23,** requesting the applicant to identify the DCD sections referred to in the departure. The applicant's response dated August 18, 2009, states that it will withdraw Departure STD DEP 16.3-12 and restore the text that was modified in the bases for GTS 3.9.7 and 3.9.8. This response resolves **RAI 16-23** and Departure STD DEP 16.3-12. The staff verified that Revision 4 of the COL application, Parts 2, 4, and 7, does not include this departure.

Based on the above, PTS 3.9.7 and bases are acceptable.

### 16.4.12.8 *3.9.8 Residual Heat Removal (RHR) - Low Water Level*

GTS 3.9.8 and bases are incorporated by reference into the PTS and bases with the following departures and no COL items:

- STD DEP 16.3-9 — LCO 3.4.7 Alternate Decay Heat Removal (bases only)

See the evaluation of this departure in Subsection 16.4.7.7 of this SER.

- STD DEP 16.3-12 (withdrawn) — LCO 3.9.7, Residual Heat Removal Flow Path (bases only)

See the evaluation of this departure in Subsection 16.4.12.7 of this SER.

- STD DEP 16.3-13 — LCO 3.9.8, RHR - "Low Water Level" Applicability (bases only)

The Applicability of GTS 3.9.8 is "Mode 5 with irradiated fuel in the reactor pressure vessel (RPV) and with the water level < 7.0 m above the top of the RPV flange." However, the "LCO" section of the bases for GTS 3.9.8 states, "In MODE 5 with the water level < 7.0 m above the reactor pressure vessel (RPV) flange two RHR shutdown cooling subsystems must be OPERABLE." This departure corrects this inconsistency by revising the bases so that the bases of PTS 3.9.8 are consistent with the Applicability. In addition, the bases for Actions B and C of GTS 3.9.8 state:

> If at least one RHR subsystem is not restored to OPERABLE status immediately, additional actions are required to minimize any potential fission product release to the environment.

The bases for Actions B and C of PTS 3.9.8 replace this sentence with the following sentence to be consistent with the requirements in Actions B and C of PTS 3.9.8:

> With the required shutdown cooling subsystem(s) inoperable and the required alternate method(s) of decay heat removal not available in accordance with Required Action A.1, additional actions are required to minimize any potential fission product release to the environment.

These changes make the PTS bases consistent with the requirements as stated in PTS 3.9.8. Therefore, this departure is acceptable.

Based on the above, PTS 3.9.8 and bases are acceptable.

Based on the above evaluations, PTS Section 3.9 and bases are acceptable.

### 16.4.13 PTS Section 3.10 – Special Operations

This PTS section has the following departures and one Table 16.1 COL item:

- STD DEP 7.7-18 — Rod Control and Information System Operator Information (bases only)
- STD DEP 16.3-4 — LCO 3.1.1, Shutdown Margin (SDM)
- 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 Test – Refueling [bases only]
- 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 [bases only]
- STD DEP 16.3-21 — LCO 3.10.5, Control Rod Drive Removal - Refueling
- STD DEP 16.3-23 — LCO 3.10.5, Control Rod Drive Removal – Refueling [bases only]
- STD DEP 16.3-24 — LCO 3.10.3, Control Rod Withdrawal - Hot Shutdown Bases [bases only]
- STD DEP 16.3-26 — LCO 3.10.2, Reactor Mode Switch Interlock Testing [bases only]
- STD DEP 16.3-27 — LCO 3.10.2, Reactor Mode Switch Interlock Testing [bases only]
- STD DEP 16.3-28 — LCO 3.10.1, In-Service Leak and Hydrostatic Testing Operation [bases only]
- Table 16.1 COL Item 125

#### 16.4.13.1 *3.10.1 Inservice Leak and Hydrostatic Testing Operation*

GTS 3.10.1 and bases are incorporated by reference into the PTS and bases with the following departure and no COL items:

- STD DEP 16.3-28 — LCO 3.10.1, In-Service Leak and Hydrostatic Testing Operation [bases only]

The “Applicable Safety Analyses” section of the bases for GTS 3.10.1 states, “The consequences of a steam leak under pressure testing conditions, with secondary containment OPERABLE, will be conservatively bounded by the consequences of the postulated main steam line break outside of the secondary containment accident analysis described in Reference 2.”

Reference 2 is DCD Tier 2, Section 15.1. The postulated main steam line break outside of secondary containment analysis is not discussed in Section 15.1. It is discussed in DCD Tier 2, Section 15.6.4. This departure is acceptable because it incorporates the appropriate reference into the bases for PTS 3.10.1.

Based on the above evaluation, PTS 3.10.1 and bases are acceptable.

### 16.4.13.2 *3.10.2 Reactor Mode Switch Interlock Testing*

GTS 3.10.2 and bases are incorporated by reference into the PTS and bases with the following departures and no COL items.

- STD DEP 16.3-26 — LCO 3.10.2, Reactor Mode Switch Interlock Testing [bases only]

The "Background" section of the bases for GTS 3.10.2 discusses the reactor mode switch positions and the related scram interlock functions. The discussion includes a reference to a reactor high water level scram. The ABWR design does not include a "reactor high water level scram." Therefore, the bases for PTS 3.10.2 omit the reference to the scram for consistency with the DCD. Additionally, the PTS bases add, for each mode switch position, supplemental information regarding the neutron monitoring system scram, the turbine control valve fast closure, and the turbine stop valve closure scram to clarify and enhance the background discussion consistent with FSAR Tier 2, Subsection 7.2.1.1.6.2. This departure is acceptable because it makes the PTS bases consistent with the design of STP Units 3 and 4.

- STD DEP 16.3-27 — LCO 3.10.2, Reactor Mode Switch Interlock Testing [bases only]

The "LCO" section of the bases for GTS 3.10.2 contains a listing of other Special Operations LCOs applicable in Modes 3, 4, and 5. This listing includes LCO 3.10.7, "Control Rod Testing – Operating," which is applicable in MODES 1 and 2 with LCO 3.1.6 not met. Because GTS/PTS 3.10.2 is not applicable in Modes 1 and 2, the reference to LCO 3.10.7 is removed from the PTS bases.

Removal of LCO 3.10.7 from this bases section is acceptable because LCO 3.10.2 applicability is MODES 3, 4, and 5; whereas, LCO 3.10.7 is only applicable in MODES 1 and 2. LCO 3.10.7 is for special testing, such as control rod testing (scram timing, friction testing) and core physics testing, which are performed during startup when reactor conditions are compatible with these tests. These tests cannot be performed in MODES 3, 4, and 5, because the reactor mode switch is in the shutdown or refuel position (all rods normally inserted). Also, LCO 3.10.2 confirms certain aspects of associated interlocks during periodic tests and calibrations in MODES 3, 4, and 5; whereas, LCO 3.10.7 permits bypassing the rod worth minimizer by imposing administrative controls to perform the tests.

In addition, this departure adds LCO 3.10.1, LCO 3.10.5, LCO 3.10.6, LCO 3.10.8, LCO 3.10.11, and LCO 3.10.12 to the listing in the PTS bases because they are applicable in MODES 3, 4, and 5. These changes make the LCO section of the bases for PTS 3.10.2 consistent with the applicability requirements of the listed specifications. Therefore, this departure is acceptable.

Based on the above evaluations, PTS 3.10.2 and bases are acceptable.

### 16.4.13.3 *3.10.3 Single Control Rod Withdrawal - Hot Shutdown*

GTS 3.10.3 and bases are incorporated by reference into the PTS and bases with the following departure and no COL items:

- STD DEP 7.7-18 — Rod Control and Information System Operator Information [bases only]

This departure revises the "Background" section of the bases for GTS 3.10.3 by changing the description of the manner in which the RCIS is placed in the Scram Test Mode. The GTS bases references the use of an RCIS "Rod Test Switch" to allow two control rods to be withdrawn for scram testing during hot shutdown. This "Rod Test Switch" is placed in the Scram Test Mode through the use of the RCIS Dedicated Operators Interface (DOI) panel (i.e., the switch is now a touch panel button). The "Background" section of the bases for GTS 3.10.3 states the following:

> A control rod pair (those associated by a shared CRD hydraulic control unit) may be withdrawn by utilizing the Rod Test Switch which "gangs" the two rods together for rod position and control purposes.

This departure replaces this sentence with the following sentence in the bases for PTS 3.10.3:

> A control rod pair (those associated by a shared CRD hydraulic control unit) may be withdrawn by utilizing the RCIS scram test mode which "gangs" the two rods together for rod position and control purposes.

This departure proposes a change that consists only of rewording for the clarification to be consistent with the design of the operator interface for STP Units 3 and 4. Thus, this departure does not change the meaning or intent of the original bases of GTS 3.10.3. Therefore, Departure STD DEP 7.7-18 is acceptable as it relates to the PTS 3.10.3. See Section 7.7 of this SER for an additional evaluation of this departure.

- STD DEP 16.3-24 — LCO 3.10.3, Control Rod Withdrawal – Hot Shutdown Bases [bases only]

The LCO section of the bases for GTS 3.10.3 contains a listing of other Special Operations LCOs that are applicable in "Mode 3 with the reactor mode switch in the refuel position." This listing includes LCO 3.10.4, "Control Rod Withdrawal-Cold Shutdown," which is applicable in "Mode 4 with the reactor mode switch in the refuel position." Because GTS/PTS 3.10.3 is not applicable in Mode 4, the reference to LCO 3.10.4 is removed from the PTS bases. By definition, Mode 3 (Hot Shutdown) is reactor temperature above 93 degrees Celsius with the mode switch in the shutdown position (and the refuel position under special conditions), while Mode 4 is defined as reactor temperature at or below 93 degrees Celsius. Therefore, Departure STD DEP 16.3-24 is acceptable because it eliminates this contradiction and makes the LCO section of the bases for PTS 3.10.3 consistent with the applicability requirements of the listed specifications.

Based on the above evaluation, PTS 3.10.3 and bases are acceptable.

### 16.4.13.4 *3.10.4 Single Control Rod Withdrawal - Cold Shutdown*

GTS 3.10.4 and bases are incorporated by reference into the PTS and bases with the following departures and no COL items:

- STD DEP 7.7-18 — Rod Control and Information System Operator Information [bases only]

This departure revises the "Background" section of the bases for GTS 3.10.4 by changing the description of the manner in which the RCIS is placed in the Scram Test Mode. The GTS bases references the use of an RCIS "Rod Test Switch" to allow two control rods to be withdrawn for scram testing during cold shutdown. This "Rod Test Switch" is placed in the Scram Test Mode using the RCIS DOI panel (i.e., the switch is now a touch panel button). The "Background" section of the bases for GTS 3.10.4 states the following:

> A control rod pair (those associated by a shared CRD hydraulic control unit) may be withdrawn by utilizing the Rod Test Switch which "gangs" the two rods together for rod position and control purposes.

This departure replaces this sentence with the following sentence in the "Background" section of the bases for PTS 3.10.4:

> A control rod pair (those associated by a shared CRD hydraulic control unit) may be withdrawn by utilizing the RCIS scram test mode which "gangs" the two rods together for rod position and control purposes.

The "Applicable Safety Analyses" section of the bases for GTS 3.10.4 states the following:

> When the rod test switch is used and GANG mode is selected for the RCIS, the selected rod pair is substituted for a single rod within the appropriate logic in order to satisfy the refuel mode rod-out interlock.

This departure replaces that sentence with the following sentence in the "Applicable Safety Analyses" section of the bases for PTS 3.10.4:

> When the RCIS scram test mode is used and GANG mode is selected for the RCIS, the selected rod pair is substituted for a single rod within the appropriate logic in order to satisfy the refuel mode rod-out interlock.

This departure proposes changes that consist only of rewording for the clarification to be consistent with the design of the operator interface for STP Units 3 and 4, and thus does not change the meaning or intent of the original bases of GTS 3.10.4. Therefore, Departure STD DEP 7.7-18 is acceptable as it relates to the PTS 3.10.4. See Section 7.7 of this SER for an additional evaluation of this departure.

- STD DEP 16.3-19 — LCO 3.10.4, Control Rod Withdrawal – Cold Shutdown

GTS LCO 3.10.4 states:

> The reactor mode switch position specified in Table 1.1-1 for MODE 4 may be changed to include the refuel position and operation considered not to be in MODE 2, to allow the withdrawal of a single control rod or control rod pair and the subsequent removal of the associated control rod drives (CRD) if desired, provided that the following requirements are met:

Requirement c.2 of LCO 3.10.4 states:

> All other control rods in a five by five array centered on the control rod being withdrawn are disarmed.

The proposed PTS LCO 3.10.4 revises Requirement c.2 of GTS LCO 3.10.4 to account for the CRD design in which most of the control rods are withdrawn in pairs, as follows with added text underlined:

> All other control rods in a five by five array centered on the control rod <u>or control rod pair</u> being withdrawn are disarmed.

The proposed sentence could be misinterpreted and is not as clear as SR 3.10.4.2, which states,

> Verify all control rods, other than the control rod or rod pair being withdrawn, in a five by five array centered on each control rod being withdrawn, are disarmed.

The staff issued **RAI 16-42** requesting the applicant to revise Departure STD DEP 16.3-19 so that PTS 3.10.4.c.2 states:

> All control rods, other than the control rod or rod pair being withdrawn, in a five by five array centered on each control rod being withdrawn, are disarmed.

The applicant's response dated August 20, 2009, states that LCO 3.10.4.c.2 will be revised as suggested in the RAI. The staff reviewed a mark-up of the pages in Part 2 and Part 4 of the COL application affected by the response to the RAI, which was included in the response letter, and which the staff found to be acceptable. As noted by the applicant, the staff agrees that the RAI did not warrant a change to Part 7 of the COL application. The staff verified that Part 2 and Part 4 of Revision 4 of the COL application include the revised requirement of LCO 3.10.4.c.2. This response resolves **RAI 16-42** and makes Departure STD DEP 16.3-19 acceptable.

- STD DEP 16.3-20 — LCO 3.10.4, Control Rod Withdrawal – Cold Shutdown [bases only]

The "LCO" section of the bases for GTS 3.10.4 contains a listing of other Special Operations LCOs applicable in Mode 4 with the reactor mode switch in the refuel position. This listing includes LCO 3.10.3, "Control Rod Withdrawal-Hot Shutdown," which is applicable in "Mode 3 with the reactor mode switch in the refuel position." Because GTS/PTS 3.10.3 is not applicable in Mode 4, the reference to LCO 3.10.3 is removed from the PTS bases. By definition, Mode 3 (Hot Shutdown) is reactor temperature above 93 °C with the mode switch in the shutdown position (and the refuel position under special conditions), while Mode 4 is defined as reactor temperature at or below 93 °C. This departure is acceptable because it eliminates this contradiction and makes the LCO section of the bases for PTS 3.10.4 consistent with the applicability requirements of the listed specifications.

Based on the above evaluation, PTS 3.10.4 and bases are acceptable.

### 16.4.13.5 *3.10.5 Control Rod Drive (CRD) Removal - Refueling*

GTS 3.10.5 and bases are incorporated by reference into the PTS and bases with the following departure and no COL items:

- STD DEP 7.7-18 — Rod Control and Information System Operator Information [bases only]

This departure revises the "Background" section of the bases for GTS 3.10.5 by changing the description of the manner in which the RCIS is placed in the Scram Test Mode. The GTS bases references the use of an RCIS "Rod Test Switch" to allow two control rods to be withdrawn for scram testing during cold shutdown. This "Rod Test Switch" is placed in the Scram Test Mode using the RCIS DOI panel (i.e., the switch is now a touch panel button). The "Background" section of the bases for GTS 3.10.5 states the following:

> A control rod drive pair (those associated by a shared CRD hydraulic control unit) may be removed under the control of the rod-out interlock by utilizing the rod test switch.

This departure replaces this sentence with the following sentence in the "Background" section of the bases for PTS 3.10.5:

> A control rod drive pair (those associated by a shared CRD hydraulic control unit) may be removed under the control of the rod-out interlock by utilizing the RCIS scram test mode.

The "Applicable Safety Analyses" section of the bases for GTS 3.10.5 states the following:

> When the rod test switch is used, the selected rod pair is substituted for a single rod within the appropriate logic in order to satisfy the refuel mode rod-out interlock.

This departure replaces that sentence with the following sentence in the "Applicable Safety Analyses" section of the bases for PTS 3.10.5:

> When the RCIS scram test mode is used, the selected rod pair is substituted for a single rod within the appropriate logic in order to satisfy the refuel mode rod-out interlock.

This departure proposes changes that consist only of rewording for the clarification to be consistent with the design of the operator interface for STP Units 3 and 4, and thus does not change the meaning or intent of the original bases of GTS 3.10.5. Therefore, Departure STD DEP 7.7-18 is acceptable as it relates to the PTS 3.10.5. See Section 7.7 of this SER for an additional evaluation of this departure.

- STD DEP 16.3-21 — LCO 3.10.5, CRD Removal – Refueling

GTS 3.3.1.1 Function 2.a, "APRM Neutron Flux-High, Setdown," is applicable in Mode 2 and Function 2.d, "APRM-Inop," and is applicable in Modes 1 and 2. GTS 3.10.5 is applicable in

Mode 5 (Refueling) with LCO 3.9.5, “Control Rod OPERABILITY – Refueling,” not met. GTS LCO 3.10.5 allows the requirements of Function 2.a and Function 2.d to be suspended in Mode 5 when utilizing this Special Operations LCO. Because LCO 3.10.5 is only used when in Mode 5 with LCO 3.9.5 not met, there is no need to suspend the non-Mode 5 applicable requirements of Function 2.a and 2.b. Therefore, they are omitted from PTS LCO 3.10.4. This departure is acceptable because when utilizing LCO 3.10.5, GTS 3.3.1.1 Functions 2.a and 2.d provide no operating restrictions that need to be suspended. Omitting them from the list of suspended functions in LCO 3.10.5 has no adverse safety impact on operations utilizing LCO 3.10.5.

- STD DEP 16.3-23 LCO 3.10.5, CRD Removal – Refueling [bases only]

This departure corrects the bases for GTS 3.10.5 by changing the reference in the “LCO” and in the “Applicability” sections of the bases from LCO 3.3.8.2, “Vital AC Electric Power Monitoring,” to LCO 3.3.8.1, “Electric Power Monitoring.” This departure also corrects the bases for GTS 3.10.5 by changing the reference in the “LCO” section from LCO 3.3.1.2, “Reactor Protection System (RPS) and MSIV Trip Actuation Logic,” to LCO 3.3.1.2, “RPS and MSIV Actuation.” However, additional corrections are possible. The staff issued **RAI 16-44 and RAI 16-53** requesting the applicant to change two references in the “LCO” section of the bases for GTS 3.10.5 from LCO 3.3.1.1, “SSLC Instrumentation,” to LCO 3.3.1.1, “Safety System Logic and Control (SSLC) Sensor Instrumentation;” and LCO 3.3.1.2, “Reactor Protection System (RPS) and MSIV Trip Actuation Logic,“ to 3.3.1.2, “Reactor Protection System (RPS) and Main Steam Isolation Valve (MSIV) Actuation.” The applicant’s responses dated August 20, 2009, and September 8, 2009, state that the references will be revised as suggested in the RAIs. The staff reviewed markups of the pages in Parts 2, 4, and 7 of the COL application affected by the responses to these RAIs, which were included in the response letters and found them acceptable. The staff verified that Revision 4 of the COL application, Parts 2, 4, and 7, include the stated changes to the "LCO" section of the bases for PTS 3.10.5. These responses resolve **RAI 16-44** and **RAI 16-53**. Therefore, this departure is acceptable.

Based on the above evaluation, PTS 3.10.5 and bases are acceptable.

### 16.4.13.6 *3.10.6 Multiple Control Rod Withdrawal – Refueling*

GTS 3.10.6 and bases are incorporated by reference into the PTS and bases with no departures and no COL items. Therefore, PTS 3.10.6 and bases are acceptable.

### 16.4.13.7 *3.10.7 Control Rod Testing - Operating*

GTS 3.10.7 and bases are incorporated by reference into the PTS and bases with the following departure and no COL items.

- STD DEP 16.3-4 LCO 3.1.1, Shutdown Margin (SDM) [bases only]

For the evaluation of this departure, see Subsection 16.4.4.1 of this SER under the evaluation of PTS 3.1.1.

Based on the above, PTS 3.10.7 and bases are acceptable.

### 16.4.13.8 *3.10.8 SHUTDOWN MARGIN (SDM) Test – Refueling*

GTS 3.10.8 and bases are incorporated by reference into the PTS and bases with the following departure and no COL items.

- STD DEP 16.3-18 — LCO 3.10.8, SHUTDOWN MARGIN Test - Refueling

The applicant proposes to modify the “Actions” section of the bases for GTS 3.10.8 to reflect accurately GTS 3.10.8, Required Actions A.1 and B.1. In particular, the phrase “for reasons other than Condition B” is added to the bases for Required Action A.1 to accurately reflect Condition A, which is “One or more of the above requirements not met, for reasons other than Condition B.” In addition, the bases for Required Action B.1 are revised to describe Condition B as “one control rod not coupled to its associated CRD.” These clarifications are acceptable because they only make the bases more consistent with Conditions A and B and do not change the intent.

The Applicability of GTS 3.10.8 is “MODE 5 with the reactor mode switch in startup/hot-standby position.” If one control rod is not coupled to its associated CRD, the unit is in Condition B. Required Action B.1 requires immediately declaring the affected control rod inoperable. However, if the reactor mode switch is still in the startup/hot-standby position upon entry into Condition B, then the unit must be considered to be in Mode 2 for the following reason. Because LCO 3.10.5.c requires each withdrawn control rod to be coupled to its associated CRD when it is not met, the allowance of LCO 3.10.8 to consider the unit to be in Mode 5, even though the mode switch is in the startup/hot-standby position, no longer applies. But upon entering Condition B the intent of the GTS is to consider the unit to be in Mode 5, because the mode switch is expected to be immediately placed in the shutdown or refuel position. Consequently, the GTS intends the Actions of GTS 3.9.5, “Control Rod OPERABILITY – Refueling,” to apply. Therefore, in the staff issued **RAI 16-45,** to ensure that the unit will follow the Actions of LCO 3.9.5 upon entering Condition B of PTS 3.10.8, by requesting the applicant to add Required Action B.2, “Place the reactor mode switch in the shutdown or refuel position,” with a Completion Time of “Immediately” to PTS 3.10.8. The applicant’s response (dated August 26, 2009) states that the suggested change will be made to Action B and the associated bases for PTS 3.10.8. The staff reviewed a markup of the pages in Parts 2, 4, and 7 of the COL application affected by the response to the RAI, which are included in the response letter. The staff found the markup acceptable. The staff verified that Revision 4 of the COL application, Parts 2, 4, and 7, includes the stated changes to Action B and the "Actions" section of the bases for PTS 3.10.8. This response resolves **RAI 16-45** and makes Departure STD DEP 16.3-18 acceptable.

Based on the above evaluation, PTS 3.10.8 and bases are acceptable.

### 16.4.13.9 *3.10.9 Reactor Internal Pumps (RIPs) – Testing*

GTS 3.10.9 and bases are incorporated by reference into the PTS and bases with no departures and the following COL item:

- Table 16.1 COL item 16.1-125

The applicant completes the “Background,” “Applicable Safety Analysis,” “LCO,” “Applicability,” and “Actions” sections of the bases for PTS 3.10.9 by removing the brackets from the GTS

value of “nine” for the minimum number of RIPs required to be in operation. See the evaluation of **RAI 16-21 Issue 3**, at the beginning part of Section 16.4 of this SER. The staff confirmed that these values are incorporated in Revision 3 of the COL application. Because nine is the correct site-specific value, Table 16.1 COL Item 125 is resolved.

Based on the above, PTS 3.10.9 and bases are acceptable

### 16.4.13.10 *3.10.10 Training Startups*

GTS 3.10.10 and bases are incorporated by reference into the PTS and bases with no departures and no COL items. Therefore, PTS 3.10.10 and bases are acceptable.

### 16.4.13.11 *3.10.11 Low Power PHYSICS TEST*

GTS 3.10.11 and bases are incorporated by reference into the PTS and bases with no departures and no COL items. Therefore, PTS 3.10.11 and bases are acceptable.

### 16.4.13.12 *3.10.12 Multiple Control Rod Drive Subassembly Removal - Refueling*

GTS 3.10.12 and bases are incorporated by reference into the PTS and bases with the following departure and no COL items:

- STD DEP 16.3-17 — LCO 3.10.12, Multiple Control Rod Drive Subassembly Removal – Refueling

This departure inserts the word “applicable” to LCO 3.10.12 and SR 3.10.12.1, just before “anti-rotation devices,” to indicate that not both of the anti-rotation devices are required to maintain the rod in the correct position and to maintain the control rod fully inserted, as follows with added text underlined:

PTS LCO 3.10.12 states:

> The requirements of LCO 3.9.3, “Control Rod Position”; LCO 3.9.4, “Control Rod Position Indication”; and LCO 3.9.5, “Control Rod OPERABILITY - Refueling,” may be suspended, and the “full in” position indicators may be bypassed for any number of control rods in MODE 5, to allow removal of control rod drive subassemblies with the control rods maintained fully inserted by their <u>applicable</u> anti-rotation devices.

PTS SR 3.10.12.1 states:

> Verify the <u>applicable</u> anti-rotation devices associated with each CRD subassembly removed are in the correct position to maintain the control rod fully inserted.

The “Background” section of the bases for GTS 3.10.12 is updated to describe when each device applies, as follows (as indicated by the addition of the underlined text):

> The purpose of this MODE 5 Special Operations LCO is to permit multiple control rod drive subassembly removal during refueling by imposing certain administrative controls. For the purposes of this LCO, CRD subassembly

removal is the removal of the CRD motor assembly, which includes the motor, brake, and synchro, the position indicator probe (PIP) and the spool piece assembly, with the associated control rod maintained in the fully inserted position by applicable mechanical anti-rotational locking devices (i.e., one device applies to FMCRD motor assembly removal prior to spool piece removal, and another device applies to spool piece removal following motor assembly). With the CRD subassembly removed, control rod position indication is not available in the control room. Reference 2 contains a description of the CRD subassembly removal.

This Special Operations LCO establishes the necessary administrative controls to allow bypass of the "full in" position indicators for CRDs with subassemblies removed for maintenance and the associated rods maintained fully inserted by their applicable mechanical anti-rotation locking devices. LCO 3.10.6 establishes administrative controls for the complete removal of multiple CRDs where the control rods are fully withdrawn.

The "Applicable Safety Analyses" section of the bases for GTS 3.10.12 is updated as follows:

To allow multiple control rod drive subassembly removal, the "full in" position indication is allowed to be bypassed for each control rod drive with its subassembly removed and the associated control rod maintained fully inserted by its applicable mechanical anti-rotation locking devices.

The "Applicability" section of the bases for GTS 3.10.12 is updated as follows with deleted text lined out:

Operation in MODE 5 is controlled by existing LCOs. The exceptions from other LCO requirements (e.g., the ACTIONS of LCO 3.9.3, LCO 3.9.4, or LCO 3.9.5) allowed by this Special Operations LCO are appropriately controlled by allowing only the removal of non-adjacent control rod drive subassemblies whose "full in" indicators are allowed to be bypassed and associated control rods maintained fully inserted by their applicable anti-rotation device ~~devices~~.

See the evaluation of FSAR Subsection 4.6.2.3.4 on "CRD Maintenance" in Chapter 4 of this SER.

STD DEP 16.3-17 is acceptable because it has no impact that may affect reactor conditions, and it clarifies that only one of the two mechanical anti-rotation devices is required to maintain the associated control rod in the correct position while also maintaining the control rod fully inserted.

Based on the preceding evaluation, PTS 3.10.12 and bases are acceptable.

Overall, based on the preceding evaluations, PTS Section 3.10 and the bases are acceptable.

### 16.4.14 PTS Section 4.0 – Design Features

This PTS section has no departures but does have the following COL items:

- Table 16.1 COL Items 126, 127, and 128

### 16.4.14.1 *4.1 Site*

GTS 4.1 is incorporated by reference into the PTS with no departures and the following COL items:

- Table 16.1 COL Items 126 and 127

The applicant's response to **RAI 16-21** proposes to complete PTS 4.1.1 and PTS 4.1.2 by providing a reference that depicts the site and exclusion area boundaries, and the low population zone (LPZ), respectively. The proposal replaces "[shall be as described or as shown in Figure 4.1-1]" with "are as shown in FSAR Figure 2.1S-3," in PTS 4.1.1; and replaces "[shall be as described or as shown in Figure 4.1-2]" with "is as shown in FSAR Figure 2.1S-3," in PTS 4.1.2. Accordingly, PTS Section 4.0 also omits GTS Figures 4.1-1 and 4.1-2. The staff issued **RAI 16-69** requesting the applicant to include in PTS Section 4.1 either a description of these items or figures that show these items; the figures must satisfy the criteria in the reviewer's notes for these figures in GTS Section 4.0. The staff made the request so that PTS Section 4.1 will satisfy 10 CFR 50.36(c)(4), and be consistent with the STS and the plant-specific TS for STP Units 1 and 2. The applicant's response dated January 13, 2009 (ML100141738), provides a description to identify the site and exclusion area boundaries, and the Low Population Zone (LPZ). The staff finds this description sufficient to satisfy 10 CFR 50.36(c)(4) and the guidance in the STS. The staff verified that Revision 4 of the COL application contains the stated change. Therefore, Table 16.1 COL Items 126 and 127, and **RAI 16-69** are resolved.

Based on the above, PTS 4.1 is acceptable.

### 16.4.14.2 *4.2 Reactor Core*

GTS 4.2 is incorporated by reference into the PTS with no departures and no COL items. Therefore, PTS 4.2 is acceptable.

### 16.4.14.3 *4.3 Fuel Storage*

GTS 4.3 is incorporated by reference into the PTS with no departures and the following COL item:

- Table 16.1 COL Item 128

The applicant completes PTS 4.3.1.2.d by removing the brackets from "[approximately 16]" so that PTS 4.3.1.2.d states:

> The new fuel storage racks are designed and shall be maintained with:
>
> d. A nominal approximately 16 cm center to center distance between fuel assemblies placed in storage racks.

The applicant's response to **RAI 16-21** states that the bracketed phrase is correct. Therefore, Table 16.1 COL Item 128 is resolved.

Based on the above evaluation, PTS 4.3 is acceptable.

Based on the above evaluation, PTS Section 4.0 is acceptable.

### 16.4.15 PTS Section 5.0 – Administrative Controls

This PTS section has the following departures and COL items:

- STD DEP T1 2.14-1 Hydrogen Recombiner Requirements Elimination
- STD DEP T1 3.4-1 Safety-Related I&C Architecture
- STD DEP 16.3-8 LCO 3.4.9 RCS Pressure and Temperature (P/T) Limits
- STD DEP 16.5-1 Unit Responsibility
- STD DEP 16.5-2 Unit Staff
- STD DEP 16.5-3 Technical Specification Bases Control Program
- STD DEP 16.5-4 Reporting Requirements
- STD DEP 16.5-5 TS 5.2.2 Unit Staff - Working Hours
- STD DEP 16.5-6 TS 5.5.2.6 – Inservice Testing Program
- STD DEP 16.3-100 Setpoint Control Program Implementation
- Table 16.1 COL Items 129 through 156

#### 16.4.15.1 *5.1 Responsibility*

GTS 5.1 is incorporated by reference into the PTS with the following departure and COL items:

- STD DEP 16.5-1 Unit Responsibility

This departure removes “Mode 4” from the requirement of GTS 5.1.2 that “During any absence of the [SS] Shift Supervisor/Manager from the control room while the unit is in MODE 1, 2, 3, or 4, 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 that “During any absence of the [SS] Shift Supervisor/Manager from the control room while the unit is in MODE 5, 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 that states, “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 or 4, at least one licensed Senior Reactor Operator (SRO) shall be present in the control room.”

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.

- Table 16.1 COL Item 129

The applicant completes PTS 5.1.1 by replacing "[Plant Superintendent]" with the actual personnel title of “Plant General Manager" in PTS 5.1.1. This change resolves Table 16.1 COL Item 129.

- Table 16.1 COL Item 130

The applicant completes PTS 5.1.2 by replacing "[Shift Supervisor (SS)]" with the actual personnel title of "Shift Supervisor / Manager," and "[highest level of corporate or site management]" with the actual personnel title of "President & Chief Executive Officer" in PTS 5.1.2. This change resolves Table 16.1 COL Item 130.

Based on the above evaluation, PTS 5.1 is acceptable.

### 16.4.15.2 *5.2 Organization*

GTS 5.2 is incorporated by reference into the PTS with the following departures and COL items:

- STD DEP 16.5-1 Unit Responsibility

See the evaluation of this departure in Subsection 16.4.15.1 of this SER.

- STD DEP 16.5-2 Unit Staff

This departure replaces “auxiliary operator” in GTS 5.2.2.a with “non-licensed operator” in PTS 5.2.2.a. This change is acceptable 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.

- STD DEP 16.5-5 TS 5.2.2 Unit Staff - Working Hours

The applicant’s response to **RAI 16-1** proposes in this departure to complete Table 16.1 COL Item 136, which is referenced in the applicant’s response to **RAI 16-13** dated August 18, 2009, to incorporate TSTF-511-A regarding working hours for personnel who perform safety-related functions. TSTF-511-A was approved for referencing in Federal Register (FR) 79923 on November 30, 2008. This generic change to the STS removes Specification 5.2.2.d, because the TS requirements related to working hours are superseded by the worker fatigue requirements in 10 CFR Part 26. Therefore, Departure STD DEP 16.5-5 is acceptable. **RAI 16-13** is resolved based on the applicant’s response to **RAI 16-1** to complete Table 16.1 COL Item 136 by Departure STD DEP 16.5-5, which incorporates TSTF-511-A into the PTS. The staff has verified that Revision 4 of the COL application includes the changes proposed by the applicant in Departure STD DEP 16.5.5.

- Table 16.1 COL Item 131

The applicant completes PTS 5.2.1.a by replacing "[applicant's FSAR]" with "FSAR or the Quality Assurance Program Description (QAPD)" in PTS 5.2.1.a. This change resolves Table 16.1 COL Item 131 because the PTS contain a specific reference to where the onsite and offsite organizational requirements are documented.

- Table 16.1 COL Item 132

The applicant completes PTS 5.2.1.b by replacing "[Plant Superintendent]" with the actual personnel title of "Plant General Manager," which is the title of the position responsible for the overall safe operation of the plant. This change resolves Table 16.1 COL Item 132.

- Table 16.1 COL Item 133

The applicant completes PTS 5.2.1.c by replacing "[a specified corporate executive position]" with the actual personnel title of "President & Chief Executive Officer," which is the title of the corporate executive position with corporate responsibility for overall plant nuclear safety. This change resolves Table 16.1 COL Item 133.

- Table 16.1 COL Item 134

The applicant completes PTS 5.2.2.c by providing the site-specific title, “Radiation Protection Technician,” in place of “[Health physics Technician].” PTS 5.2.2.c and Table 16.1 COL Item 134 are resolved because “Radiation Protection Technician” is the title that will be used for this staff position at STP Units 3 and 4.

- Table 16.1 COL Item 135

The applicant completes PTS 5.2.2.b as described in the evaluation of STD DEP 16.5-1 in Subsection 16.4.15.1 of this SER. This resolves Table 16.1 COL Item 135. The staff noted that the changed text in GTS 5.2.2.b is not bracketed; therefore, the GTS does not designate this item as part of COL Item 16.1.

- Table 16.1 COL Item 136

The applicant omits bracketed GTS 5.2.2.d from the PTS and resolves Table 16.1 COL Item 136 as described in the above evaluation of STD DEP 16.5-5.

- Table 16.1 COL Items 137 and 138

The applicant completes PTS 5.2.2.d by replacing "[The Operations Manager or Assistant Operations Manager]" with the actual personnel title of "The Operations Division Manager" in PTS 5.2.2.d; this is acceptable because it is the title of the position requiring the person to hold an active SRO license. Therefore, Table 16.1 COL Items 137 and 138 are resolved.

Based on the above evaluation, PTS 5.2 is acceptable.

### 16.4.15.3 *5.3 Unit Staff Qualifications*

GTS 5.3 is incorporated by reference into the PTS with the following COL item:

- Table 16.1 COL Item 139

The applicant completes GTS 5.3.1 by replacing the bracketed statement "[Each member of the unit staff shall meet or exceed the minimum qualifications of ANSI N18.1-1971.]" with the following:

Each member of the unit staff shall meet or exceed the minimum qualifications of RG 1.8, Rev 3, 2000 with the following exception:

a. During cold license operator training prior to Commercial Operation, the Regulatory Position C.1.b of Regulatory Guide 1.8, Revision 2, 1987, applies. Cold license operator candidates meet the training elements defined in ANS/ANSI 3.1-1993 but are exempt from the experience requirements defined in ANS/ANSI 3.1-1993.

This proposed site-specific requirement for unit staff qualifications is acceptable because it is an acceptable unit staff qualification standard. PTS 5.3.1 is also consistent with the STS. This change resolves Table 16.1 COL Item 139.

Based on the above, PTS 5.3 is acceptable.

### 16.4.15.4 *5.4 Technical Specifications (TS) Bases Control*

GTS 5.4 is incorporated by reference into the PTS with the following departure and no COL items:

- STD DEP 16.5-3 Technical Specification Bases Control Program

GTS 5.4.2.b states, “A change to the site-specific portion of the FSAR that involves an unreviewed safety question as defined in 10 CFR 50.59, or a change to Tier 2 of the plant-specific DCD that involves an unreviewed safety question as defined in the design certification rule for the ABWR (Appendix A to 10 CFR Part 52).” This departure changes this statement so that PTS 5.4.2.b states, “A change to the site-specific portion of the FSAR or Bases that requires NRC approval pursuant to 10 CFR 50.59, or the design certification rule for the ABWR (Appendix A to 10 CFR Part 52).” This change is appropriate because it correctly describes the bases change process that will be used following approval of the COLs for the two units. This change is also appropriate because it is consistent with the equivalent STS 5.5.11.b.2, which states, “A change to the updated FSAR or Bases that requires NRC approval pursuant to 10 CFR 50.59.” Specifically, the term “unreviewed safety question” is no longer used in 10 CFR 50.59. Therefore, this departure is acceptable.

Based on the above evaluation, PTS 5.4 is acceptable.

### 16.4.15.5 *5.5.1 Procedures*

GTS 5.5.1 is incorporated by reference into the PTS with no departures and the following COL item:

- Table 16.1 COL Item 140

The applicant completes GTS 5.5.1.1.b by removing the brackets from "[Generic Letter 82-33]" so that PTS 5.5.1.1.b states,

> Written procedures shall be established, implemented, and maintained covering the following activities:

b. The emergency operating procedures required to implement the requirements of NUREG-0737 and NUREG-0737, Supplement 1, as stated in Generic Letter 82-33;

Because Generic Letter 82–33 is the correct site-specific reference, Table 16.1 COL Item 140 is resolved.

Based on the above evaluation, PTS 5.5.1 is acceptable.

### 16.4.15.6 *5.5.2 Programs and Manuals*

PTS 5.5.2 contains the following 11 specifications.

#### 16.4.15.6.1 *5.5.2.1 Offsite Dose Calculation Manual (ODCM)*

GTS 5.5.2.1 is incorporated by reference into the PTS with no departures and one COL item:

- Table 16.1 COL Item 141

The applicant completes PTS 5.5.2.1.b by replacing "[Plant Superintendent]" with the actual personnel title of "Plant General Manager," which is the title of the position that approves licensee-initiated changes to the ODCM. This change resolves Table 16.1 COL Item 141.

Based on the above evaluation, PTS 5.5.2.1 is acceptable.

#### 16.4.15.6.2 *5.5.2.2 Primary Coolant Sources Outside Containment*

GTS 5.5.2.2 is incorporated by reference into the PTS with the following departure and no COL items:

- STD DEP T1 2.14-1 Hydrogen Recombiner Requirements Elimination

See the evaluation of this departure in Subsection 16.4.9.11 of this SER.

Based on the above, PTS 5.5.2.2 is acceptable.

#### 16.4.15.6.3 *5.5.2.3 Post Accident Sampling*

GTS 5.5.2.3 is incorporated by reference into the PTS with no departures and no COL items. Therefore, PTS 5.5.2.3 is acceptable.

#### 16.4.15.6.4 *5.5.2.4 Radioactive Effluent Controls Program*

GTS 5.5.2.4 is incorporated by reference into the PTS with no departures and no COL items. Therefore, PTS 5.5.2.4 is acceptable.

#### 16.4.15.6.5 *5.5.2.5 Component Cyclic or Transient Limit*

GTS 5.5.2.5 is incorporated by reference into the PTS with no departures and no COL items. Therefore, PTS 5.5.2.5 is acceptable.

### 16.4.15.6.6 *5.5.2.6 Inservice Testing Program*

GTS 5.5.2.6 is incorporated by reference into the PTS with one departure and no COL items.

- STD DEP 16.5-6 TS 5.5.2.6 – Inservice Testing Program

This departure updates GTS 5.5.2.6 to current regulatory requirements in response to **RAI 16-15.** PTS 5.5.2.6 states that the Inservice Testing (IST) Program references Section XI of the ASME Boiler & Pressure Vessel Code (BPV Code) and applicable Addenda for testing frequencies and other aspects of the IST Program. The IST Program is categorized as an operational program per the guidance in Commission Paper SECY-05-0197 and RG 1.206. Based on this guidance, a COL applicant is expected to provide a full description of operational programs for NRC review in support of its COL application. The current NRC regulations in 10 CFR 50.55a incorporate by reference the ASME Code for Operation and Maintenance of Nuclear Power Plants (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, NUREG–1434, "Standard Technical Specifications for General Electric Plants, BWR/6," Revision 3.1, dated December 1, 2005, specifies the use of the ASME OM Code for development of the IST Programs for these plants. The staff requested that the applicant update PTS 5.5.2.6 in Part 4, and Chapter 16 of Part 2, "Final Safety Analysis Report," of the COL application, to reference the ASME OM Code. This change will make PTS 5.5.2.6 consistent with the full description of the IST Program that the staff will review using the guidance in NRC Standard Review Plan Section 3.9.6, "Functional Design, Qualification, and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints." PTS 5.5.2.6 should also note that the NRC regulations in 10 CFR 50.55a specify modifications to the IST provisions in the ASME OM Code that need to be addressed as part of the IST Program for STP Units 3 and 4. For example, the NRC regulations in 10 CFR 50.55a(b)(3)(ii) require the establishment of a program to ensure that motor-operated valves continue to be capable of performing their design-basis safety functions. In accordance with the ABWR design certification rule and 10 CFR 52.7, the staff also requested that the applicant describe and justify the update to PTS 5.5.2.6 in an associated standard departure from the ABWR GTS in Part 7, "Departures Report," of the COL application. Finally, the staff requested that the applicant add a markup of the affected GTS pages in Chapter 16 of Part 2 of the COL application.

The applicant's response to **RAI 16-15** dated August 18, 2009, states the GTS will be upgraded so that PTS 5.5.2.6 conforms to current regulatory requirements and references the ASME OM Code. The applicant's response letter includes markups of affected pages in Parts 2 and 4 of the COL application. Additionally, the applicant includes new standard departure (STD DEP) 16.5-6, which provides the basis for this change. The staff reviewed these revised pages and found them acceptable. The staff verified that Revision 4 of the COL application, Parts 2, 4, and 7, includes the changes contained in the revised pages. This response resolves **RAI 16-15** and makes Departure STD DEP 16.5-6 acceptable.

Based on the above evaluation, PTS 5.5.2.6 is acceptable.

### 16.4.15.6.7 *5.5.2.7 Ventilation Filter Testing Program*

GTS 5.5.2.7 is incorporated by reference into the PTS with no departures and the following COL items:

- Table 16.1 COL Item 142

The applicant completes PTS 5.5.2.7 by replacing "[Regulatory Guide]" with "Regulatory Guide 1.52, Revision 2" so that the initial paragraph of PTS 5.5.2.7 states:

> A program shall be established to implement the following required testing of Engineered Safety Feature (ESF) filter ventilation systems at the frequencies specified in Regulatory Guide 1.52, Revision 2, and in accordance with Regulatory Guide 1.52, Revision 2, ASME N510-1989; and AG-1-1991.

This change resolves Table 16.1 COL Item 142.

- Table 16.1 COL Item 143

The applicant completes PTS 5.5.2.7.a by replacing bracketed values for inplace test criteria for ESF ventilation system HEPA filters so that PTS 5.5.2.7.a states:

a. Demonstrate for each of the ESF systems that an inplace test of the high efficiency particulate air (HEPA) filters shows a penetration and system bypass < 0.05% when tested in accordance with Regulatory Guide 1.52, Revision 2, and ASME N510-1989 at the system flowrate specified below ± 10%:

| ESF Ventilation System | Flowrate |
|---|---|
| Control Room Habitability System | 5,100 $m^3$/h |
| Standby Gas Treatment System | 6,800 $m^3$/h |

The applicant's response to **RAI 16-21** states that the tolerances are based on RG 1.52 Revision 2, Section C and ASME N510–1989 Section 8.6.1; and the flowrate values were obtained by calculation. The staff found these values acceptable. This response resolves Table 16.1 COL Item 143.

- Table 16.1 COL Item 144

The applicant completes PTS 5.5.2.7.b by replacing bracketed values for inplace test criteria for ESF ventilation system charcoal adsorbers so that PTS 5.5.2.7.b states:

b. Demonstrate for each of the ESF systems that an inplace test of the charcoal adsorber shows a penetration and system bypass < 0.05% when tested in accordance with Regulatory Guide 1.52, Revision 2, and ASME N510-1989 at the system flowrate specified below ± 10%:

| ESF Ventilation System | Flowrate |
|---|---|
| Control Room Habitability System | 5,100 $m^3$/h |
| Standby Gas Treatment System | 6,800 $m^3$/h |

The applicant's response to **RAI 16-21** states that the tolerances are based on RG 1.52 Revision 2, Section C and ASME N510–1989 Section 8.6.1; and the flowrate values were obtained by calculation. The staff found these values acceptable. This response resolves Table 16.1 COL Item 144.

- Table 16.1 COL Item 145

The applicant completes PTS 5.5.2.7.c by replacing bracketed values for laboratory test criteria for the ESF ventilation system charcoal adsorber sample so that PTS 5.5.2.7.c states:

> c. Demonstrate for each of the ESF systems that a laboratory test of a sample of the charcoal adsorber, when obtained as described in Regulatory Guide 1.52, Revision 2, shows the methyl iodide penetration less than the value specified below when tested in accordance with ASTM D3803-1989 at a temperature of ≤ 30°C and greater than or equal to the relative humidity specified below:

| ESF Ventilation System | Penetration | RH |
|---|---|---|
| Control Room Habitability System | 0.175 | 70% |
| Standby Gas Treatment System | 0.175 | 70% |

The applicant's response to **RAI 16-21** states that the temperature criterion is based on ASTM D3803-1989, and that the penetration and relative humidity criteria values were obtained by calculation. The staff found these values acceptable. This response resolves Table 16.1 COL Item 145.

- Table 16.1 COL Item 146

The applicant completes PTS 5.5.2.7.c by omitting the reviewer's note for GTS 5.5.2.7.c from PTS 5.5.2.7.c, as described in the evaluation of the applicant's response to **RAI 16-21 Issue 22**, in the beginning of Section 16.4 of this SER. This change resolves Table 16.1 COL Item 146.

- Table 16.1 COL Item 147

The applicant completes PTS 5.5.2.7.d by replacing bracketed values for test criteria for maximum pressure drop across combined HEPA filters, the prefilters, and the charcoal adsorbers so that PTS 5.5.2.7.d states:

> d. Demonstrate for each of the ESF systems that the pressure drop across the combined HEPA filters, the prefilters, and the charcoal adsorbers is less than the value specified below when tested in accordance with Regulatory Guide 1.52, Revision 2, and ASME N510-1989 at the system flowrate specified below ± 10%:

| ESF Ventilation System | Delta P | Flowrate |
|---|---|---|
| Control Room Habitability System | 1,745.8 Pa | 5,100 $m^3$/h |
| Standby Gas Treatment System | 2,147.9 Pa | 6,800 $m^3$/h |

The applicant's response to **RAI 16-21** states that the flow rate tolerances are based on ASME N510-1989 Section 8.6.1, and the flow rate values were obtained by calculation. The staff found these values acceptable. This response resolves Table 16.1 COL Item 147.

- Table 16.1 COL Item 148

The applicant completes PTS 5.5.2.7.e by replacing bracketed values for test criteria for energy dissipation by ESF ventilation system heaters so that PTS 5.5.2.7.e states:

> e. Demonstrate that the heaters for each of the ESF systems dissipate the value specified below ± 10% when tested in accordance with ASME N510-1989:
>
> | ESF Ventilation System | Wattage |
> |---|---|
> | Control Room Habitability System | 65.5 kw |
> | Standby Gas Treatment System | 26.2 kw |

The applicant's response to **RAI 16-21** states that the flow rate tolerance is based on ASME N510-1989 Section 8.6.1, and the wattage values were obtained by calculation. The staff found these values acceptable. This response resolves Table 16.1 COL Item 148.

Based on the above evaluation, PTS 5.5.2.7 is acceptable.

#### 16.4.15.6.8 *5.5.2.8 Explosive Gas Radioactivity Monitoring Program*

GTS 5.5.2.8 is incorporated by reference into the PTS with no departures and no COL items. Therefore, PTS 5.5.2.8 is acceptable.

#### 16.4.15.6.9 *5.5.2.9 Diesel Fuel Oil Testing Program*

GTS 5.5.2.9 is incorporated by reference into the PTS with no departures and no COL items. Therefore, PTS 5.5.2.9 is acceptable.

#### 16.4.15.6.10 *5.5.2.10 Software Error Evaluation Program*

GTS 5.5.2.10 is incorporated by reference into the PTS with no departures and no COL items. Therefore, PTS 5.5.2.10 is acceptable.

#### 16.4.15.6.11 *5.5.2.11 Setpoint Control Program*

GTS 5.5.2.11 is incorporated into the PTS in accordance with the following departure and no COL items:

- STD DEP 16.3-100 Setpoint Control Program Implementation

The applicant proposes Departure STD DEP 16.3-100 in response to **RAI 16-65 Issue 1**. This departure omits the GTS bracketed placeholders for instrumentation "allowable values" (AVs) from the PTS and adds new Specification 5.5.2.11, "Setpoint Control Program," to the PTS. To tie the SCP specification to SRs for Division Functional Tests, Channel Functional Tests, Sensor Channel Calibrations, and Channel Calibrations, the PTS will require performing these SRs in accordance with TS 5.5.2.11, "Setpoint Control Program." The SCP specification and associated changes to the GTS are acceptable if they satisfy the conditions for implementing "Option 3" of DC/COL-ISG-8, as described in the beginning of Section 16.4 of this SER. That is, the PTS administrative program for controlling the relocated site-specific information must:

9. Conform to applicable regulatory requirements.

The SCP specification conforms to 10 CFR 50.36(c)(1)(A), regarding the inclusion of limiting safety system settings (LSSS) in the TS because PTS 5.5.2.11.a states:

> The Setpoint Control Program (SCP) implements the regulatory requirement of 10 CFR 50.36(c)(1)(ii)(A) that technical specifications will include items in the category of limiting safety system settings (LSSS), which are settings for automatic protective devices related to those variables having significant safety functions."

The proposed use of "Option 3" for meeting 10 CFR 50.36(c)(1)(A) is equivalent to explicitly including AVs in the PTS because the LSSS requirements remain enforceable by the NRC. The PTS will maintain an equivalent level of control over LSSS requirements because (1) each SR that requires instrument setpoint verification must be performed "in accordance with TS 5.5.2.11"; and (2) the SCP specification meets the other conditions as discussed below. In addition, the staff considers the SCP specification to be more restrictive than the GTS because it places TS controls on values for the "nominal trip setpoint" (NTS), "as-left tolerance" (ALT), and "as-found tolerance" (AFT), while maintaining equivalent TS controls over AVs.

The "Background" section of the bases for GTS 3.3.1.1 states the following regarding LSSS:

> For the purpose of this specification the LSSS are defined as the Allowable Values, which, in conjunction with the LCOs, establish the threshold for protective system action to prevent exceeding acceptable limits, including Safety Limits (SLs), during Design Basis Accidents (DBAs).

Based on the applicant's response to **RAI 16-65 Issue 3**, the staff understands that the proposed setpoint methodology, WCAP-17119-P, "Methodology for South Texas Project Units 3 & 4 ABWR Technical Specification Setpoints" and / or WCAP-17137-P, "Westinghouse Stability Methodology for the ABWR," will define the AV to account for the anticipated deviation from the NTS of the instrument trip setting between Channel Functional Tests. The applicant does not expect this deviation will be significant compared to the ALT band around the NTS because the AV only accounts for drift associated with the instrumentation components that process the sensor output signal up to and including the setpoint comparison, which includes either analog components, digital components, or both. Considering this, the staff finds that the above bases statement is consistent with the NRC staff's guidance in NRC Regulatory Issue Summary 2006-17, "NRC Staff Position On The Requirements of 10 CFR 50.36, 'Technical Specifications,' Regarding Limiting Safety System Settings During Periodic Testing and Calibration of Instrument Channels" (RIS 2006-17).

The proposed SCP specification is also consistent with the guidance in RIS 2006-17 by requiring the unit to verify that the instrument trip setting is within the ALT band around the NTS before declaring the SR met at the start of the surveillance interval. In addition, the SCP specification requires the following:

- If the as-found value of the instrument trip setting is outside the ALT band around the NTS, the unit must adjust the instrument trip setting to within the ALT band before declaring the SR met and returning the instrument channel to service.

- If the as-found value of the instrument trip setting is also outside the AFT band around the NTS, the unit must also evaluate the instrument to verify it is functioning in accordance with its design basis before declaring the surveillance requirement met and returning the instrument channel to service.

- If the as-found value of the instrument channel trip setting is less conservative than the specified AV, the SR is not met and the instrument channel shall be immediately declared inoperable.

Based on the above, the staff concludes that PTS 5.5.2.11 conforms to the applicable regulatory requirements.

10. Require using an NRC-approved methodology to determine site-specific information.

PTS 5.5.2.11.b specifies using an NRC-approved methodology by stating:

> The Nominal Trip Setpoint (NTS), Allowable Value (AV), As-Found Tolerance (AFT), and As-Left Tolerance (ALT) for each Technical Specification required automatic protection instrumentation function shall be calculated in conformance with the NRC approved WCAP-17119-P "Methodology for South Texas Project Units 3 & 4 ABWR Technical Specification Setpoints[," Revision 2.] Additionally, the NRC approved methodology shall define acceptable margin as margin greater than or equal to the ALT.

The staff concludes that the SCP specification will require using an NRC-approved methodology. Subsection 7.1.4 of this report contains the staff's evaluation of WCAP-17119-P. This evaluation was tracked in the SER with open items as part of **Open Item 16-1** (**RAI 16-65**). In the above quotation, the revision number is in brackets because Revision 4 of the COL application does not include the revision number, but should. Verification that PTS 5.5.2.11.b includes the approved revision number in a future revision of the COL application is being tracked as part of **Confirmatory Item 16-65.1**.

As described in Subsection 7.1.4 of this report, the staff issued **RAI 07.01-16** regarding the reference, in Revision 1 of WCAP-17119-P, to WCAP-17137-P, "Westinghouse Stability Methodology for the ABWR" for determining the OPRM setpoints (Table 3-80, Note 7). Since WCAP-17137-P is a part of the fuel related topical reports that form the basis for post COL fuel amendment application, making a reference to a post COL document in the COL application is not acceptable. In the response to **RAI 07.01-16** dated June 17, 2010 (ML101720574), the applicant states that it will remove reference to WCAP-17137-P from WCAP-17119-P, and will revise WCAP-17119-P to include typical setpoint values and associated uncertainties for the OPRM. The applicant adds that it will remove the reference to WCAP-17137-P from PTS 5.5.2.11.b and from Departure STD DEP 16.3-100. The staff verified that Revision 2 of WCAP-17119-P, and PTS 5.5.2.11.b and Departure STD DEP 16.3-100 in Revision 4 of the COL application incorporate the proposed changes. The staff finds that these changes resolve **RAI 07.01-16**. Based on the staff's

approval of Revision 2 of WCAP-17119-P, as documented in Section 7.1.4 of this report, the staff concludes that PTS 5.5.2.11.b is acceptable.

11. Require establishing a document to record the site-specific information.

    The staff concludes that the SCP specification meets this criterion because PTS 5.5.2.11.e requires that the SCP "establish a document containing the current value of the specified NTS, AV, AFT, and ALT for each Technical Specification required automatic protection instrumentation function and references to the calculation documentation."

12. Specify controlling changes to the specified document in accordance with 10 CFR 50.59 and the NRC-approved setpoint methodology.

    The staff concludes that the SCP specification meets this criterion because PTS 5.5.2.11.e states: "Changes to this document shall be governed by the regulatory requirement of 10 CFR 50.59. In addition, changes to the specified NTS, AV, AFT, and ALT values shall be governed by the NRC approved setpoint methodology."

13. Specify the schedule for providing the NRC with updates to the specified document.

    The staff concludes that the SCP specification meets this criterion because PTS 5.5.2.11.e states: "This document, including any midcycle revisions or supplements, shall be provided upon issuance for each reload cycle to the NRC."

Based on the above, the staff concludes that the proposed SCP specification and the associated other changes to the GTS satisfy the conditions for implementing "Option 3" of DC/COL-ISG-8 for completing site-specific information related to LSSS in the PTS. In addition, PTS 5.5.2.11.d requires that the "difference between the instrument channel trip setting as-found value and the previous as-left value for each Technical Specification required automatic protection instrumentation function shall be trended and evaluated to verify that the instrument channel is functioning in accordance with its design basis." This provision is acceptable because it will increase the chance of early detection and repair or replacement of a malfunctioning instrument. For these reasons, the staff finds that the change to GTS Subsection 5.5.2 made by Departure STD DEP 16.3-100 with the addition PTS 5.5.2.11 is acceptable.

Section 16.2 of this SER lists the subsections of this SER that address the changes to the GTS and bases that are within the scope of the departure. The beginning part of Section 16.4 of this SER describes all of the changes to the GTS and bases that are within the scope of the departure.

Based on the above evaluation, PTS 5.5.2.11 is acceptable.

Based on the above, PTS 5.5.2 is acceptable.

### 16.4.15.7 *5.6 Safety Function Determination Program*

GTS 5.6 is incorporated by reference into the PTS with no departures and no COL items. Therefore, PTS 5.6 is acceptable.

### 16.4.15.8 *5.7 Reporting Requirements*

PTS 5.7 contains the following specifications:

#### 16.4.15.8.1 *5.7.1.1 Annual Reports*

GTS 5.7.1.1 is incorporated by reference into the PTS with the following departure and COL item:

- STD DEP 16.5-4 Reporting Requirements

To be consistent with 10 CFR 20.2206, this departure revises GTS 5.7.1.1 to change the due date from March 31 to April 30, for an annual report covering the activities of the unit, so that the initial paragraph of PTS 5.7.1.1 states:

> Annual Reports covering the activities of the unit as described below for the previous calendar year shall be submitted by April 30 of each year. The initial report shall be submitted by April 30 of the year following initial criticality.

The PTS should be consistent with the regulations; therefore, Departure STD DEP 16.5-4 is acceptable.

- Table 16.1 COL Item 149

The applicant completes PTS 5.7.1.1 by removing the brackets from (1) the Note regarding the format of annual reports from a multiple unit station; and (2) the sentence that states, "[The initial report shall be submitted by March 31 of the year following initial criticality.]"; and by deleting the bracketed placeholder (paragraph b) for site-specific annual reports, since there are no such reports. These are appropriate changes for STP Units 3 and 4. Therefore, Table 16.1 COL Item 149 is resolved.

Based on the above evaluation, PTS 5.7.1.1 is acceptable.

#### 16.4.15.8.2 *5.7.1.2 Annual Radiological Environmental Operating Report*

GTS 5.7.1.2 is incorporated by reference into the PTS with no departures and the following COL item:

- Table 16.1 COL Item 150

The applicant completes PTS 5.7.1.2 by removing the brackets from the note on combining reports at a multiple unit station, and the instructions on report format. The applicant also deletes the requirement for environmental radiation monitoring using thermoluminescent dosimeters (TLDs) co-located with NRC TLDs, based on SECY-97-169-P, September 8, 1997, "Change to the Independent Radiation Monitoring Program Under Which the NRC Contracts with States to Monitor the Environment Around NRC Licensed Facilities." These changes resolve Table 16.1 COL Item 150.

Based on the above evaluation, PTS 5.7.1.2 is acceptable.

### 16.4.15.8.3 *5.7.1.3 Radioactive Effluent Release Report*

GTS 5.7.1.3 is incorporated by reference into the PTS with no departures and the following COL item:

- Table 16.1 COL Item 151

The applicant completes PTS 3.7.1.3 by removing the brackets from the Note on report format at a multiple unit site. This change resolves Table 16.1 COL Item 151.

Based on the above evaluation, PTS 5.7.1.3 is acceptable.

### 16.4.15.8.4 *5.7.1.4 Monthly Operating Reports*

GTS 5.7.1.4 is incorporated by reference into the PTS with no departures and no COL items. Therefore, PTS 5.7.1.4 is acceptable.

### 16.4.15.8.5 *5.7.1.5 CORE OPERATING LIMITS REPORT (COLR)*

GTS 5.7.1.5 is incorporated by reference into the PTS with no departures and the following COL items:

- Table 16.1 COL Items 152 and 153

The applicant completes PTS 5.7.1.5.a by replacing the bracketed placeholder with the following list of specifications that address the core operating limits:

LCO 3.2.1, “Average Planar Linear Heat Generation Ratio (APLHGR)”
LCO 3.2.2, “Minimum Critical Power Ratio (MCPR)”
LCO 3.3.1.1, “SSLC Sensor Instrumentation”
LCO 3.3.4.1, “ATWS and EOC-RPT Instrumentation”

The applicant also completes PTS 5.7.1.5.b by replacing the bracketed placeholder for the document references for the NRC-approved analytical methods used to determine the core operating limits with “NEDE-24011-P-A, ‘General Electric Standard Application on Fuel,’ September 1988.” These changes are acceptable. Therefore, Table 16.1 COL Items 152 and 153 are resolved.

Based on the above evaluation, PTS 5.7.1.5 is acceptable.

### 16.4.15.8.6 *5.7.1.6 RCS PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)*

GTS 5.7.1.6 is incorporated by reference into the PTS with the following departure and COL items:

- STD DEP 16.3-8 — LCO 3.4.9 RCS Pressure and Temperature (P/T) Limits

This departure proposes that the PTS omit the reference to NEDO 21778-A in the bases for GTS 3.4.9, because this document does not contain the pressure-temperature (P/T) limit methodologies applicable to the ABWR and STP Units 3 and 4. This departure also revises the

information in PTS 5.7.1.6. The NRC staff's review and approval of PTS 5.7.1.6 is contingent upon an acceptable resolution of the issues relating to **RAI 05.03.02-1**. Either the P/T limits or the PTLR for STP Units 3 and 4 must be provided to the NRC for review and approval before the issuance of a COL. In **RAI 05.03.02-1**, the staff requested the applicant to submit to the NRC for review and approval all documentation (methodologies, calculations, reports, etc.) used in developing the P/T limits or the PTLR.

The staff's review and approval of the information presented in Revision 3 of the COL application regarding RCS pressure-temperature limits is contingent upon an acceptable resolution of the issues relating to RCS pressure-temperature limits. Section 5.3.2 of this report describes the staff's evaluation of the applicant's response to **RAI 05.03.02-1**, dated April 2, 2009 (ML090960299), and the proposed PTLR, which the applicant submitted on July 23, 2009 (ML092080079).

The applicant's response to **RAI 05.03.02-1** proposes replacing the bracketed reference in GTS 5.7.1.6, "[Topical Report(s), number, title, date, and staff approval document, or staff safety evaluation report for a plant-specific methodology by NRC letter and date]." with 'SIR-05-044-A, "Pressure-Temperature Limits Report Methodology for Boiling Water Reactors," April 2007, and approved for referencing in license applications by the NRC in letter dated February 6, 2007 from Ho K Nieh Deputy Director, Division of Policy and Rulemaking, Office of Nuclear Reactor Regulation to Mr. Randy C. Bunt, Chair, BWR Owner's Group.' Note that this superseded Revision 2 of the COL application, which had proposed replacing the bracketed reference with "[Regulatory Guide 1.99, Revision 2, and in accordance with 10 CFR 50, Appendix G]." The applicant also proposed removing the GTS reference to "NEDO-21778-A, December 1978" in the "Applicable Safety Analysis" section and the "References" section of the bases for GTS 3.4.9. Including a reference to the P-T methodology in the bases is unnecessary because PTS 5.7.1.6 will specify SIR-05-044-A. The review of Departure STD DEP 16.3-8 regarding its effect on the GTS was contingent upon staff acceptance of this PTLR methodology. Verification of NRC approval of SIR-05-044-A and the resolution of related **RAI 05.03.02-1** was tracked in the SER with open items as part of **Open Item 16-1**. Based on the staff's finding that the pressure-temperature limits methodology is acceptable, as described in the resolution of **RAI 05.03.02-1** in Section 5.3.2 of this report, Departure STD DEP 16.3-8 is acceptable.

- Table 16.1 COL Items 154 and 155

The applicant completes PTS 5.7.1.6 by replacing the bracketed sentence "[The individual Specifications that address the reactor vessel pressure and temperature limits and the heatup and cooldown rates may be referenced.]" with "LCO 3.4.9, RCS Pressure and Temperature (P/T) Limits addresses the reactor vessel pressure and temperature limits and the heatup and cooldown rates." This resolves Table 16.1 COL Item 154. The applicant also completes PTS 5.7.1.6 by replacing the following passage with the one after it (The underlined text denotes the site-specific information.):

> (GTS) The analytical methods used to determine the pressure and temperature limits including the heatup and cooldown rates shall be those previously reviewed and approved by the NRC in [Topical Report(s), number, title, date, and NRC staff approval document, or staff safety evaluation report for a plant specific methodology by NRC letter and date].
>
> (PTS) The analytical methods used to determine the pressure and temperature limits including the heatup and cooldown rates shall be those previously reviewed

and approved by the NRC in SIR-05-044-A, "Pressure-Temperature Limits Report Methodology for Boiling Water Reactors," April 2007, and approved for referencing in license applications by the NRC in letter dated February 6, 2007 from Ho K Nieh Deputy Director, Division of Policy and Rulemaking, Office of Nuclear Reactor Regulation to Mr. Randy C. Bunt, Chair, BWR Owner's Group.

Based on the staff finding that SIR-05-044-A, the pressure-temperature limits methodology, is acceptable, as described in the resolution of **RAI 05.03.02-1** in Section 5.3.2 of this report, Table 16.1 COL Item 155 is resolved.

Based on the above, PTS 5.7.1.6 is acceptable.

#### 16.4.15.8.7 *5.7.2 Special Reports*

GTS 5.7.2 is incorporated by reference into the PTS with the following departure and COL item:

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

See Chapter 7 and Subsection 16.4.6.1 of this SER for the evaluation of this departure.

- Table 16.1 COL Item 156

The applicant completes PTS 5.7.2 by omitting the bracketed initial paragraph in GTS 3.7.2, which states, "Special Reports may be required covering inspection, test, and maintenance activities. These special reports are determined on an individual basis for each unit, and their preparation and submittal are designed in the Technical Specifications." This is acceptable because the information is essentially a reviewer's note and contains no requirements. In addition, this paragraph is not needed because the PTS contain no special reports other than those listed in PTS 5.7.2.a and 5.7.2.b. This change resolves Table 16.1 COL Item 156.

Based on the above evaluation, PTS 5.7.2 is acceptable.

Based on the above, PTS Section 5.7 is acceptable.

Based on the above, PTS Section 5.0 is acceptable.

### 16.4.16 Summary of Technical Evaluation

Completion of the technical evaluation of the PTS and bases was pending the resolution of the following issues, which were tracked in the SER with open items as **Open Item 16-1**:

14. Completion of LSSS using "Option 3" was pending NRC staff approval of the instrumentation setpoint methodology. This was needed to resolve **RAI 16-65 Issue 1** (STD DEP 16.3-100; PTS 1.1, 3.3.1.1, 3.3.1.4, 3.3.4.1, 3.3.4.2, 3.3.7.1, 3.3.8.1, and 5.5.2.11; and Table 16.1 COL Items 20, 22, 31, 42, 45, 61, and 64), and **RAI 16-65 Issue 4.f**.

15. Completion of the PTLR PTS requirements using "Option 1" was pending NRC staff approval of the P/T methodology and referencing the approved P/T methodology in PTS 5.7.1.6. This was needed to resolve **RAI 16-21 Issue 14** (STD DEP 16.3-8; PTS 3.4.9 and 5.7.1.6; and Table 16.1 COL Items 74, 75, and 155).

As described in Section 16.4 and the affected subsections of Section 16.4 of this report, the staff concludes that all of the listed issues, standard departures, and Table 16.1 COL items are resolved. Therefore, **Open Item 16-1** is closed and the staff's technical evaluation of the PTS and bases is complete.

## 16.5 Post Combined License Activities

There are no post COL activities related to this chapter.

## 16.6 Conclusion

The NRC staff's finding related to information incorporated by reference is in NUREG–1503. Pursuant to 10 CFR 52.63(a)(5) and Part 52, Appendix A, Section VI.B.1, all nuclear safety issues relating to the TS that were incorporated by reference have been resolved.

The staff concludes that the information pertaining to the PTS and bases for STP Units 3 and 4 has adequately incorporated the ABWR GTS and bases, as modified by the standard departures from the GTS and bases, which require prior NRC approval as required by Section VIII.C.4 of the ABWR DCR, Appendix A to 10 CFR Part 52. The staff concludes that the departures satisfy the 10 CFR 52.7 and 10 CFR 50.12 criteria for granting an exemption from Appendix A to 10 CFR Part 52.

In addition, the staff compared the additional COL site-specific information in the application to the relevant NRC regulations, the acceptance criteria defined in NUREG–0800 Section 16.0, and other guidance. Based on its evaluation, the staff finds that the site-specific information is acceptable and that the PTS and bases are complete and adequate for use in the operation of STP Units 3 and 4.

Therefore, the staff concludes that the PTS and bases satisfy 10 CFR 50.36, 10 CFR 50.36a, 10 CFR 52.79(a)(30), and Section IV.A.2.c of the ABWR DCR, Appendix A to 10 CFR Part 52.

January 24, 2011

Mr. Scott Head, Manager
Regulatory Affairs
STP Units 3 & 4
Nuclear Innovation North America, LLC
4000 Avenue F
Bay City, TX 76109

SUBJECT: SOUTH TEXAS PROJECT UNITS 3 AND 4 COMBINED LICENSE APPLICATION – ADVANCED SAFETY EVALUATION FOR CHAPTER 16, "TECHNICAL SPECIFICATIONS"

Dear Mr. Head:

The U.S. Nuclear Regulatory Commission (NRC) staff is preparing an advanced safety evaluation (SE) for each chapter of the South Texas Project (STP) Units 3 and 4 Combined License Application (COLA) submitted by STP Nuclear Operating Company (STPNOC) on September 20, 2007.

The staff's advanced SE for Chapter 16, Technical Specifications, is being provided to the Advisory Committee on Reactor Safeguards (ACRS) Subcommittee to support the upcoming meeting of the ACRS Subcommittee, scheduled to be held on March 9, 2011.

The enclosed advanced SE is being provided only to STPNOC for review of proprietary information pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390 "Public Inspections, Exemptions, Requests for Withholding." The staff concludes that the enclosed SE does not contain any information for which exemption from public disclosure has been sought or approved or any factual errors. However, the NRC will withhold the enclosed SE from public disclosure for ten business days from the date of this letter to allow you the opportunity to verify the staff's conclusion that the SE contains no such exempt information or any factual errors. If within that ten day period, you do not request that all or portions of the SE be withheld from public disclosure, the enclosure will be made available for public inspection through the NRC Public Document Room and the Publicly Available Records component of NRC's Agencywide Documents Access and Management System (ADAMS) and placed on the NRC's public web page for this application.

**Document transmitted herewith contains sensitive unclassified information. When separated from the enclosure, this document is "DECONTROLLED."**

If you have any questions or comments concerning this matter, I can be reached at 301-415-1494 or via e-mail address at George.Wunder@nrc.gov.

Sincerely,

**/RA/**

George F. Wunder, Lead Project Manager
BWR Projects Branch
Division of New Reactor Licensing
Office of New Reactors

Docket Nos. 52-012 and 52-013

Enclosure:
As stated

cc: w/o encl. see next page

If you have any questions or comments concerning this matter, I can be reached at 301-415-1494 or via e-mail address at George.Wunder@nrc.gov.

Sincerely,

**/RA/**

George F. Wunder, Lead Project Manager
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Office of New Reactors

Docket Nos. 52-012 and 52-013

Enclosure:
As stated

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