19.2 Introduction

The information in this section of the reference ABWR DCD, including all subsections, and tables, is incorporated by reference with the following departure and supplements.

STD DEP Admin (Table 19.2-1)

19.2.2 Objective and Scope

The information in this subsection of the reference ABWR DCD is incorporated by reference with the following site-specific supplemental information.

This analysis has been updated and supplemented with site-specific information and the development of more refined System, Structure and Components (SSCs), utilized in calculating the PRA outputs to use in assessing changes in results and insights (Delta-PRA) to confirm continued compliance with requirements. The Table 19.2-2 provided in Revision 1 to the COLA is deleted in it's entirety and replaced in this Revision to the COLA. Table 19.2-2 lists the changes identified as design certification document changes or revised SSC design definitions. Those changes with potential PRA impactand the extent of the impact, are included in the last column of Table 19.2-2. Table 19.2-2 is a site-specific supplement to the reference ABWR DCD and provides the PRA screening assessment determination.

19.2.3.1 Key Assumptions and Ground Rules

The information in this subsection of the reference ABWR DCD is incorporated by reference with the following site-specific supplemental information.

The assumptions have been supplemented with updates based on site specific information and the development of more refined SSCs, and utilized in calculating PRA outputs.

19.2.3.2 Failure Probability and Field Experience

The information in this subsection of the reference ABWR DCD is incorporated by reference with the following site-specific supplemental information.

The expected loss of offsite power frequency has been supplemented to reflect updated information and site-specific data, and utilized in calculating PRA outputs to use in assessing changes in results and insights (Delta-PRA) to confirm continued compliance with requirements.

19.2.3.3 Initiating Accident Events

The information in this subsection of the reference ABWR DCD is incorporated by reference with the following site-specific supplemental information.

The expected loss of offsite power frequency has been supplemented to reflect updated information and site-specific data, and utilized in calculating PRA outputs to use in assessing changes in results and insights (Delta-PRA) to confirm continued compliance with requirements.

19.2.4.4 External Consequence Analysis

The information in this subsection of the reference ABWR DCD is incorporated by reference with the following site-specific supplemental information.

The evaluation of external consequences was updated with site-specific information using the MACCS computer code, utilized in calculating PRA outputs to use in assessing changes in results and insights (Delta-PRA) to confirm continued compliance with requirements.

19.2.4.5 Consequence Analysis Results

The information in this subsection of the reference ABWR DCD is incorporated by reference with the following site-specific supplemental information.

Evaluations were performed using site specific information and assessed against the original results of Subsection 19E.3 to confirm that the original results remain bounding.

Table 19.2-1 Key PRA Assumptions

Summary Assumptions	Reference Subsection	Confirming Subsection
Reactor Service Water System Definition	19D.6.4.2	~~19.9.21~~ **19.9.26**

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
Tier 1 (T1) Changes			
~~STD DEP T1 2.1-1 SRV Setpoints and Simmer Margin~~			
STD DEP T1 2.1-2 Reactor Pressure Vessel System	RIP motor casings do not have cladding.	The RIP is a Toshiba design in which the motor casings have cladding near stretchtube portion and end of casing.	No effect on PRA, not modeled.
STD .DEP T1 2.2-1 Control Systems Changes to Inputs, Tests, and Hardware	The reference ABWR DCD Tier 1 Table 2.2.1 ITTAC Acceptance Criteria for Item 11 states the "test signals exists in only one control channel at a time."	Only the power supply associated with the one non-Class 1E uninterruptible power supply being tested will become inoperable and both of the dual-redundant controller channels remain operational when this testing is conducted. This change also provides detail power supply design of RCIS in COLA Section 7.7.1.2(5).	No effect on PRA, not modeled.
STD DEP T1 2.3-1 Deletion of MSIV Closure and Scram on High Radiation	Design included MSIV trip on high radiation in steam tunnel	No MSIV trip on high radiation in steam tunnel	No effect on PRA, not modeled.
STD DEP T1 2.4-1 Residual Heat Removal System and Spent Fuel Pool Cooling	The ABWR has two RHR loops connected to the Fuel Pool Cooling and Cleanup System (FPCCS) with normally closed interties to permit supplemental cooling during refueling outages.	The current design has three RHR loops connected to the FPCCS with normally closed interties to permit additional supplemental cooling during refueling outages to reduce outage time.	Increasing the number of RHR loops connected to FPCCS from two to three is judged to have a negligible impact on CDF; it is an improvement of the outage management control for fuel cooling system. [See 19L.6.5, 19L.6.6 19L.8, 19L.9, Table 19L-9, 19Q.4.1, 19Q.4.2, 19Q.7.6, 19Q.7.7.1]

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP T1 2.4-2 Feedwater Line Break Mitigation	For feedwater line break, feedwater flow assumed to be unavailable when hotwell inventory depleted, no automatic isolation feedwater flow.	Class 1E Breakers to trip condensate pumps required based on containment pressure analysis from feedwater Line break.	No effect on PRA, not specifically modeled.
STD DEP T1 2.4-3 RCIC Turbine/Pump	RCIC-Terry type turbine	RCIC integrated pump and turbine	The new RCIC system has been designed for operation with fewer support systems than the previous design. This reduction of operational dependencies is expected to improve reliability. No changes, other than editorial, to the PRA. [See 19.3, 19.9.12, 19.9.30, 19.11, 19.13, 19K.3, 19K.11.1, 19K Tables, 19M.6.3]
STD DEP T1 2.12-1 Electrical Breaker/Fuse Coordination and Low Voltage Testing	Electrical Power distribution interrupting devices are coordinated such that the interrupting device closest to the fault opens first.	The description of interruption device coordination has been modified to include acceptable industry practice with standards and codes (e.g. IEEE 141, IEEE 242, etc). Change is made to address the exception to DCD Tier 1 requirements for circuits feeding small loads in circuits with standard size breakers/fuses for use in 120 Vac and 125Vdc panel boards.	No effect on PRA, not modeled.
STD DEP T1 2.12-2 I&C Power Divisions	Three Divisions of Class 1E AC Power (Division I, II, and III)	Four divisions of Class 1E AC Power (Division I, II, III, and IV)	No quantifiable effect on the model. [See 19L.6.6, Table 19L.8-4, 19N, 19Q.4.4]

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP T1 2.14-1 Hydrogen Recombiner Requirements Elimination	Contains two redundant hydrogen recombiners and safety related oxygen/hydrogen analyzers.	Hydrogen recombiners are eliminated and Hydrogen and Oxygen analyzers are maintained, however downgraded to nonsafety related.	No effect on PRA, not modeled. [See 19A]
STD DEP T1 2.15-1 Radwaste Building Reclassification	The radwaste building structure is Seismic Category I.	The radwaste building structure is not classified as Seismic Category I, consistent with the design for previous nuclear plants and Regulatory Guide 1.143, Rev. 2.	No effect on PRA, not modeled. Editoria changes [See 19.4, 19H]
STD DEP T1 2.15-2 Diesel Generator Supplemental Cooling	ABWR DCD Tier 1 Subsection 2.15.5 describes the operation and setting of the Reactor Building Safety-Related DG HVAC System to control temperature in the diesel generator (DG) engine rooms during DG operation and states the maximum temperature limit in the room is 50º C.	This departure revises the DG engine room maximum temperature limit during DG operation to 60º C.	No effect on the PRA. Equipment assumed to be qualified for the environment.
~~STD DEP T1 3.2-1~~ ~~Hydrogen Water Chemistry~~			
STD DEP T1 3.4-1 Safety-Related I&C Architecture	The ABWR DCD inconsistently describes an ESF architecture that sometimes applies a dual train SLU structure for all ESF functions, while at other times applies it to a very limited set of ESF functions. The ABWR DCD also describes RMUs as strictly processing input and output signals, while CMUs (Control Room Multiplexing Units) strictly perform logic control.	The current design limits the application of the dual train SLU architecture of the limited set of ESF functions. It also allows Remote DLCs to perform some control logic functions. It also replaces the concept of CMUs in the control room with Voter Logic Units (VLUs) in the control room that perform all of the 2-out-of-4 voting trip logic.	A delta-PRA assessment was performed to assess the updates affect on the instrument fault trees and common cause failures of the EMUX and the Chapter 19D fault trees and Chapter 19N CCF. [See 19.3, 19.9.8, 19.11, 19K Tables, 19N]

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STP DEP T1 5.0-1 Site Parameters	Site parameters were chosen to bound most potential US sites.	The design basis flood level is increased in order to handle a main cooling reservoir failure. The maximum precipitation rate for rainfall is increased from 49.3 cm/hr to 50.3 cm/hr based on meteorology studies. The humidity as measured from wet bulb temperature has been increased. The STP site does not satisfy the minimum shear wave velocity of 305 m/s (1000 ft/s). The shear wave velocity varies horizontally within a soil strata and vertically with depth. a sitespecific soil structure interaction (SSI) analysis will be performed to confirm that the site specific SSI is bound by the DCD SSI.	The design basis external flood is included in the PRA. [See 19.3, 19.8, 19.9, 19.11, 19.13, 19K, 19Q 19R]. The humidity and shear wave velocity exceptions do not affect the PRA.
Tier 2 (T2) Changes			
STD DEP 1.1-1 Type of License Required	ABWR DCD was submitted for Design Certification.	The COLA is submitted to receive a Class 103 Combined License under 10 CFR 52.	No effect on the PRA.
STP DEP 1.1-2 Dual Units at STP 3 and 4	Single Unit site.	Dual Unit site with common fire protection system.	No effect on PRA, editorial changes for fire protection system [See Chapter 19I.3-1, 19L.8, 19M.6.3, 19Q.4.4]
STD DEP 1.2-1 Control Building Annex	Control Rod Drive Motor-Generator sets in Control Building.	Control rod drive motor generators and supporting equipment moved to Control Building annex.	No effect on PRA, editorial changes in 19M.6.3 for Fire Hazard reduction.
STD DEP 1.2-2 Turbine Building	A natural draft cooling tower is used for the heat sink.	Turbine Generator differs dimensionally, the main cooling reservoir is used for the heat sink.	No effect on the PRA, editorial change in 19R for level monitors.

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 1.8-1 Tier 2 Codes, Standards, and Regulatory Guide Edition Changes	The Civil design based on ASME B&PV Code Section III Division 2-1989, ACI 349- 1980, and 1991 Uniform Building Code.	The Civil design based on ASME B&PV Code Section III Division 2-2001 with 2003 Addenda, ACI 349-1997, and 2006 International Building Code.	No effect on PRA, the PRA considers all components that impact plant risk. The quality class of the component generally does not affect the modeling of the component within the PRA.
STD DEP 1.AA-1 Shielding Design Review	Appendix 1AA provides the integrated doses for environmental qualification of safetyrelated equipment.	Doses have been re-evaluated incorporating results of design detailing.	No effect on PRA, design dose rates typically not modeled. in a PRA.
STD DEP 2.2-5 CRAC2 and MAACS Codes	CRAC2 computer code is used for accident analysis.	MAACS computer code is used for accident analysis, an improvement over CRAC2.	No effect on the PRA, slight change to the consequence analysis. [See 19.2.4.4, 19.3.4, 19E, 19E.3]
STD DEP 3.5-1 Missile Protection	Not required for single unit design, favorable orientation.	Provides Site Specific information relating to main steam turbine orientation in relation to essential systems of adjoining units.	No effect on the PRA, not modeled.
STD DEP 3.6-1 Steam Tunnel Concrete Thickness	The main steam tunnel design specifies a concrete thickness of 2 meters.	The main steam tunnel design considers shielding and structural requirements for determining concrete thickness.	No effect on the PRA, not modeled.
STD DEP 3.8-1 Resizing the Radwaste Building	--	Due to process changes described in STD DEP 11.2-1 and 11.4-1, the dimensions and design analysis for the Radwaste Building has changed from the DCD, revising its minimum bearing capacity, shear wave velocity, and Poisson ratio to reflect the shallower Radwaste Building Embedment	No effect on the PRA, not modeled.

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 3.9-1 Reactor Internals Materials	Code Case 580-1 material is applied.	Code Case N5280-2 material is used, a nickel-based alloy.	No effect on the PRA, not modeled.
STD DEP 3B-1 Equation Error in Containment Impact Load	The multiplying factor "W" dimensions are seconds/foot.	In analyzing containment impact loads, the multiplying factor "W" is corrected to 0.0052 seconds/meter.	No effect on the PRA, not modeled.
STD DEP 3H-1 Liner Anchor Material	ABWR DCD Tier 2 Subsection 3H.1.4.4.3 incorrectly identifies the Containment Liner Anchor material as ASTM A-633 Gr. C.	This departure corrects the Containment Liner Anchor material identified in Subsection 3H.1.4.4.3 to SA-36.	No effect on the PRA. Building design details are outside the scope.
~~STD DEP 3I-1 Environmental Qualifications – Conditions~~			
STD DEP 3I-2 Environmental Qualifications - Radiation	--	The "Integrated Dose-Gamma & Beta" values for the main steam tunnel is revised and instrument rack rooms is returned to the DCD value based on current results of postaccident radiation calculations and analysis.	No effect on the PRA, not modeled.
STD DEP 3MA-1 Interfacing LOCA	--	The ISLOCA evaluation is inconsistent with STD DEP T1 2.4-1, 2.4-3 and the COLA P&IDs.	No effect on the PRA, screened from evaluation due to piping redesign. [See 19.8, and 19B.2.45 of DCD]
~~STD DP 4.4-1 Stability Analysis~~			

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 4.5-1 Reactor Materials	--	The description of the materials for the control rod drive (CRD) mechanisms in Section 4.5.1 and the reactor internals in Section 4.5.2 of the DCD have been revised (1) to reflect the materials successfully used in operating ABWR designs over the last 10 years; (2) to clarify some data and provide equivalent materials, as appropriate; and (3) to clarify some fabrication and material issues for reactor internals materials.	No effect on the PRA, not modeled.
STD DEP 4.6-1 FMCRD Friction Test Equipment	FMRCF friction testing utilizes a special test fixture connected to the HCU test port. The test fixture contains a small pump and associated hydraulic controls to pressurize the underside of the hollow piston of the FMCRD.	Water for the test equipment is supplied from the CRD pump discharge line. With this design, the test fixture pump can be eliminated.	No effect on the PRA, not modeled.
STD DEP 5.2-2 PSI/ISI NDE of the Reactor Coolant Pressure Boundary	PSI and ISI of welds in Reactor Coolant System meet requirements of Regulatory Guide 1.150, Rev.1.	PSI and ISI of welds in Reactor Coolant System piping meet the requirements of ASME Section XI, Appendix VIII as mandated by 10 CFR 50.55a.	No effect on the PRA, not modeled.
STD DEP 5.3-1 Reactor Pressure Vessel Material Surveillance Plan	--	Site specific supplement per COL License Information Item 5.5 in DCD 5.3.4.2.	No effect on the PRA, not modeled.
STD DEP 5.4-1 Reactor Water Cleanup System	Two 50% RWCU pumps (approximately 1% feedwater flow).	Flow capacity of pumps and filter demineralizers increased by 100% (approximately 2% feedwater flow). Pump discharge head increased.	Not explicitly modeled in the PRA. [See 19L.6.6, 19L.8, 19L.6.4, 19Q.4.1, 19Q.7.6, 19Q.7.7.1, 19QB]

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 5.4-2 Reactor Recirculation System	--	Revised design of the RIP's cable box allows improved serviceability and maintainability because of smaller cable boxes and plug in power connector.	No effect on the PRA, not modeled.
STD DEP 5.4-3 Residual Heat Removal System Interlock	(1) The RHR IBD diagram includes an interlock that will close the wetwell spray valve in the low pressure flooder (LPF) mode. The statement that the wetwell spray can be operated with the system in the LPF mode is incorrect. (2) Table 5.4-3 indicates the open logic for the minimum flow valve is "pump running AND low loop flow signal", logic diagram indicates "pump discharge pressure high AND low loop flow"; (3) several pressure relief valves in Table 5.4-5 indicate relief pressure is 3.44 MPaG, however design pressure is 3.43MPaG	Items (1) and (2) logic inconsistencies corrected; item (3) In Table 5.4-3, relief pressure for E11-F028A-C and E11-F051AC are changed from 3.44 MPa to 3.43 MPa.	No effect on the PRA, not modeled.
STD DEP 5.4-4 RMC Heat Exchanger	Section 5.4.1 describes that the materials for the RMHX shell, shell tube sheet, and water box are carbon steel.	Stainless steel will be used for the RMHX shell, shell tube sheet, and water box.	No effect on the PRA, not modeled.
STD DEP 5A-1 Delete Appendix on Complying with Regulatory Guide	Text is included in Appendix 5A on complying with RG 1.150 which covers PSI and ISI welds in the Reactor Coolant System	The text of Appendix 5A on complying with RG 1.150 has been deleted because PSI and ISI will be conducted in accordance with ASME Section XI.	No effect on the PRA, not modeled.

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 5B-1 Residual Heat Removal Flow and Heat Capacity Analysis	A factor related to RHR heat removal rate is 0.3705 MW/°C with an associated UHS water temperature of 29.4°C.	To support reduced outage times, the factor related to RHR heat removal rate is increased to 0.0427 MW/°C and UHS water temperature is increased to 35°C.	No effect on the PRA.
~~STD DEP 6.2-1 Containment Purge Valve Resizing~~			
STD DEP 6.2-2 Containment Analysis	DCD assumptions resulted in potentially nonconservative calculated containment temperature and pressure responses following a feedwater line or steam line break.	Design assumptions for Feedwater Line Break (FWLB) have been updated. ANSI/ANS 5.1 1979 sets forth methods for calculating decay heat power from fission products, U239 and Np239 following shutdown of light water reactors.	No effect on the PRA.
STD DEP 6.2-3 Containment Penetrations and Isolation	--	From first-of-a-kind efforts, further design details are included in Tables 6.2-7, 6.2-8, and 6.2-9 related to containment isolation valves, primary containment penetrations, and potential leakage paths. Based on equipment procurement, containment isolation valves associated with the ABWR Primary Containment have been adjusted. ABWR Primary Containment Penetrations has been modified to meet US mechanical and electrical separation requirements. Potential leakage paths from Primary Containment to the environment are included in Table 6.2-9.	No direct effect on PRA

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 6.6-1 Pre-service and Inservice Inspection and Testing of Class 2 and Class 4 Components and Piping	RHR heat exchanger nozzles are required to have 100% accessibility for PSI during fabrication. The use of some piping system configurations is restricted to ensure that accessibility for ISI is maintained.	The 100% accessibility for PSI of heat exchanger nozzles during fabrication is no longer applicable. Additionally, an evaluation is required to insure ISI accessibility is provided if some restricted piping system configurations are used.	No effect on the PRA, not modeled
STD DEP 6C-1 Containment Debris Protection of ECCS Strainers	Conical strainer installed in DCD.	The model of strainer changed from conical suction strainer to CCI cassette type strainer which satisfies the requirements of Regulatory Guide 1.82, Rev. 3. RCIC and other system analyses do not consider blockage of suction strainers.	Potentially an improvement to the plantspecific PRA. No change to the ABWR PRA. [See 19L-8, 19Q.4.2]
STD DEP 7.1-1 References to Setpoints and Allowable values	The Technical Specifications are formatted to include Allowable Values, Setpoints, and other calculations.	The NRC changed requirements for Technical Specifications to only include Allowable Values; the correct reference is to the methods for calculating the setpoints and margins.	No effect on the PRA, not modeled.
STD DEP 7.1-2 ATWS DB for Startup Range Neutron Monitoring	Miscellaneous changes to DCD descriptions.	(1) Section 7.1.2.4.1(2)(d) clarified description of power to the stepping motor driver modules derive their power from a bus that automatically receives power from EDG if necessary. (2) The SRNM subsystem provides ATWS permissive signals to the ESF logic and control system. (3) The APRM subsystem provides ATWS permissive signal to the ESF logic and control system.	No effect on the PRA, not modeled.

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
~~STD DEP 7.1-3 Isolation of Automatic Traversing Incore Probe (ATIP)~~			
~~STD DEP 7.2-1 Neutron Monitoring System Connection to RTIF~~			
STD DEP 7.2-2 Description of Scram Actuating Relays	Relay logic contact status is specified as normally closed for air header dump valve solenoids.	Air header dump valve solenoid relay logic contact status is specified as "open" when the coil is "energized."	Correction to description. No effect on PRA, not modeled.
~~STD DEP 7.2-3 MSIV/RPS Interface~~			
STD DEP 7.2-4 Manual Scram Monitoring	Two manual scram switches and the reactor mode switch provide means to manually initiate a reactor trip. Additionally, one bypass initiating variable is monitored in addition to the scram initiating variables.	No statement about monitoring initiating variables is included to eliminate possible misinterpretation.	Clarification to text. No effect on PRA.
STD DEP 7.2-6 RPS Instrumentation Ranges	--	New specifications for Reactor Protection System Instrumentation (Reactor Vessel High Pressure, Drywell High Pressure, Reactor Vessel Low Water Level 3, Low Charging Pressure to Rod Control HCU Accumulators, Turbine Control Valve Fast Closure) are provided with ranges to optimize performance.	No effect on the PRA, not modeled.

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 7.3-1 Time Intervals for Accident Analysis	--	To insure consistency in information, input variables used in LOCA analysis are referenced to a table.	Clarification to text. No effect on PRA.
STD DEP 7.3-2 Automatic Depressurization Subsystem (ADS)	Actuation of the automatic safety/relief valves is described as "with electrical power."	Actuation of the automatic safety/relief valves utilizes pneumatics for the relieving function, but the operating air is introduced electrically through a solenoid valve.	Clarification to text. No effect on PRA.
~~STD DEP 7.3-3 Vessel Level Management~~			
STD DEP 7.3-4 ADS Logic	The DCD does not clearly describe the logic and sequencing for the ADS.	The logic and sequencing for the ADS is fully described eliminating possible misinterpretations.	Clarification to text. No effect on PRA.
STD DEP 7.3-5 Water Level Monitoring	The DCD describes the equipment design for the ADS and RHR/LPFL I&C using the terms "Low" and :Low-Low" when describing initiating inputs from the reactor water level instrumentation.	Nomenclature related to water level initiating inputs is clarified using terminology based on nominally quantified levels (terms such as "Level 1.5" and "Level 1" instead of "Low" and "Low-Low").	Clarification to text. No effect on PRA.
STD DEP 7.3-6 SRV Position Indication	In the main control room, position indication for safety/relief valves provides lights when solenoid-operated pilot valves are energized to open using LVDTs mounted on the valves.	Indication of safety/relief valve position is provided by a limit switch, giving a direct indication of the valve's position.	Not explicitly modeled in the PRA. Beneficial effect for plant-specific PRA.

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 7.3-7 ADS Manual Control	ADS inhibit switch is a keylock type.	The ADS inhibit and SRV control switches are no longer the keylock type and the ADS manual actuation is now initiated by a single pushbutton	Not explicitly modeled in the PRA. Potential beneficial effect for plant-specific PRA.
~~STD DEP 7.3-8~~ ~~Surveillance Test Controller~~			
STD DEP 7.3-9 Shutdown Cooling Operation	--	Clarifications are provided in describing RHR Shutdown Cooling Mode valve alignment during Low Pressure Flooder (LPFL) actuation signal.	Clarification to text. No effect on PRA.
STD DEP 7.3-10 ESF Logic and Control System (ELCS) Mode	The operator may control the RHR pumps and injection valves manually after LPFL initiation to use RHR capabilities in other modes if the core is being cooled by other emergency core cooling systems.	An expanded description of mode switches in the main control room is provided. To reduce operator burden and support the displays, RHR has specific mode operation capability. Additionally, ELCS mode automatic logic changes are implemented to insure that the HPCF "C" diverse hard-wired manual initiation function has priority over the normal automatic initiation logic for HPCF "C".	Not explicitly modeled in the PRA. Beneficial effect for plant-specific PRA.
STD DEP 7.3-11 Leak Detection and Isolation System Valve Leakage	Two sets of asbestos packing rings are provided with a leak-off line from the chamber between packing rings routed to a collection sump where leakage is identified.	Valves use one set of expanded graphite packing to seal the valve stem penetration, eliminating the need for a leakage detection system.	No effect on the PRA, not modeled.

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 7.3-12 Leak Detection and Isolation System Sump Monitoring	--	Technical Specification 3.4.3 (LCO, Actions B.1 and B.2, SR 3.4.3.1) and its associated Bases (Applicable Safety Analysis, LCO, Actions B.1 and B.2) are changed to show the new leakage values and the addition of an "increase in unidentified leakage" parameter.	No effect on the PRA, not modeled.
STD DEP 7.3-13 Containment Spray Logic	If Containment Spray has been initiated, then the system automatically realigns to the LPFL Mode if Reactor Vessel Water Level falls below Level 1.	The LPFL mode has precedence over Containment Spray when below Level 1. Clarifications are provided in how Drywell and Wetwell Sprays can be initiated as well as the interlocks associated with this mode of RHR operation.	Clarification to text. No effect on PRA.
STD DEP 7.3-14 Residual Heat Removal Suppression Pool Cooling	--	This departure corrects an inconsistency between COLA subsection 7.3.1.1.4 and ABWR DCD Tier 2 subsection 5.4.7.1.1.5 and Figure 7.3-4.	Clarification to text. No effect on PRA.
STD DEP 7.3-15 Reactor Building Service Water Logic Interfaces	Divisions I and II provide flow signals to the Main Control Rooms for the Reactor Coolant Water controls.	All three divisions provide flow signals to the main control rooms.	Not explicitly modeled in the PRA. Beneficial effect for plant-specific PRA.
STD DEP 7.3-16 Testing Safety Relief Valve Solenoid Valves	SRV pilot solenoid valves can only be tested when the reactor is not pressurized.	Improved testing capabilities have been incorporated into the ABWR design which allows testing to be performed at any pressure.	Not explicitly modeled in the PRA. Potential beneficial effect for plant-specific PRA.

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 7.3-17 ADS Electrical Interface	--	This change clarifies that the control logic is only performed in Division I, II, and III, conforming with the three divisions of ECCS, however sensor signals come from all four divisions	Clarification to text. No effect on PRA.
STD DEP 7.4-1 Alternate Rod Insertion	--	Multiple clarifications are made describing implementation of the ARI function.	Clarification to text. No effect on PRA.
STD DEP 7.4-2 Residual Heat Removal Alarm	DCD alarm name " RHR Logic Power Failure."	The alarm is replaced with the more general alarm "ELCS Out of Service." The "Manual Initiation Armed" alarm is clarified to only activate when the RHR system is in LFPL mode of operation.	No effect on the PRA, not modeled.
STD DEP 7.5-1 Post-Accident Monitoring (Drywell Pressure)	The details of the Post Accident Monitoring System (PAM) and Post Accident Sampling System (PAS) do not fully comply with subsequent regulatory updated requirements related to RG 1.97.	The PAM and PAS will be designed to fully comply with RG 1.97.	No effect on the PRA, not modeled.
STD DEP 7.6-1 Oscillation Power Range Monitor (OPRM) Logic	Oscillation Power Range Monitor (OPRM) trip logic performed separately from the APRM trip logic.	OPRM trip logic decisions are made within the OPRM unit and provided to the RPS separately from the APRM trips.	No effect on the PRA, not modeled.
STD DEP 7.6-2 SPTM Subsystem of Reactor Trip and Isolation System	--	The SPTM system is clarified as part of the Reactor Trip and Isolation System.	Clarification to text. No effect on PRA.
STD DEP 7.6-3 SPTM Sensor Arrangement	DCD Tier 2 Section 7.6.1.7.3(2) states that, "Each SRV in direct sight of two sets of temperature sensors within 9 meters."	Clarifies that the SRV discharge line quenchers are in direct sight.	Clarification to text. No effect on PRA.

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 7.6-4 Range of Power Range Neutron Monitoring Operability	The PRNM provide information for monitoring average power level of the reactor core and monitoring the local power when the reactor power is in the power range (above approximately 15%).	For the PRNM to provide information, the power range begins at approximately 5%.	Clarification to text. No effect on PRA.
STD DEP 7.7-1 RPV Water Level Instrumentation	All instrument lines are flushed even when they do not need to be.	Condensable gas build-up in reactor vessel reference leg water level instrument lines is addressed by using CRD water to continually flush instrument lines having condensing chambers.	Not explicitly modeled in the PRA. Potential beneficial effect for plant-specific PRA.
STD DEP 7.7-2 SRV Discharge Pipe Temperature Data Recording		Discharge temperatures of all the safety/relief valves are shown on an historian function in the control room.	No effect on the PRA, not modeled.
STD DEP 7.7-3 Feedwater Turbidity	Measurement of Feedwater turbidity is discussed.	Feedwater turbidity is not discussed; it is not considered to have any safety significance and no practical method has been developed for measurement.	Clarification to text. No effect on PRA.
STD DEP 7.7-4 Automatic Power Regulator/Rod Control	--	The APR is clarified as the direct controlling system that interfaces with the RCIS for accomplishing automatic rod movement mode and the PGCS interfaces only with APR for initiating various reactor power change control tasks.	Clarification to text. No effect on PRA.

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 7.7-5 Rod Control and Information System (RCIS) Display	--	Detailed information about available display information at the RCIS dedicated operator interface on the main control panel is provided.	Clarification to text. No effect on PRA.
STD DEP 7.7-6 RCIS Commands	--	Redundant "command signals" are provided from RFCS to RCIS for the ARI function.	Clarification to text. No effect on PRA.
STD DEP 7.7-7 RCIS Design	--	RCIS design details pertaining to the organization, classification, and/or erminology of component groupings have been modified. Additionally, a more complete design description is provided.	Clarification to text. No effect on PRA.
~~STD DEP 7.7-8 RCIS Power Sources~~			
STD DEP 7.7-9 Selected Control Rod Run-In (SCRRI) Function	--	As a secondary function, the SCRRI function provides mitigation of loss of a feedwater heating event	Clarification to text. No effect on PRA.
STD DEP 7.7-10 Control Rod Drive Control System Interface	--	The CRT display is replaced with the RCIS Dedicated Operator Interface, a flat panel touch screen. A discussion of the RAPI enforcing rod blocks based upon signals external and internal to the system is added.	No effect on the PRA, not modeled.
STD DEP 7.7-11 Rod Withdrawal Sequence Restrictions	--	Ganged Rod movement and ganged withdrawal sequence restrictions are expanded.	No effect on the PRA, not modeled.

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 7.7-12 RCIS Indication	--	Provides detailed design information including the reference rod pull sequence, RCIS capability, RCIS providing feedback signals, generation of a rod withdrawal block signal, and an audible alarm at the operators panel for a RRPS violation.	Clarification to text. No effect on PRA.
STD DEP 7.7-13 Optical Isolation	Discusses the details of a specific technology that can be used for achieving optical isolation. However, the description is overly restrictive in describing a specific type of optical technology to be used for meeting the optical isolation.	The detailed description of the specific type of technology used for optical isolation is removed to prevent restricting the type of technology that can be used for achieving suitable optical isolation.	Clarification to text. No effect on PRA.
STD DEP 7.7-14 RCIS Bypass	--	Clarification in design details for RCIS.	Clarification to text. No effect on PRA.
~~STD DEP 7.7-15~~ ~~Scram Time Testing~~			
~~STD DEP 7.7-16~~ ~~Automated Thermal Limit Monitor (ALTM) Algorithm Description~~			
~~STD DEP 7.7-17~~ ~~RCIS Interface~~			
STD DEP 7.7-18 RCIS Operator Interface	--	New annunciation (alarms) for the RCIS - Rod insert block and RWM Trouble. Some status information is now shown on MCRP display. Logic and control actions available on the Dedicated Operator's Panel.	Clarification to text. No effect on the PRA.

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
~~STD DEP 7.7-19~~ ~~RCIS Maintenance~~			
STD DEP 7.7-20 Recirculation Flow Control Logic	The Recirculation Flow Control System automatically operates when above 70% power.	Information is provided concerning manual and automatic operation for other rod patterns and power levels; operation below 25% has been described and load follow capability has been enhanced.	Clarification to text. No effect on PRA.
~~STD DEP 7.7-21~~ ~~Feedwater Flow Transmitter~~			
STD DEP 7.7-22 ATLM Description	--	The description of the ATLM setpoint and rod block action has been expanded to further describe the interface of the systems and the applications.	Clarification to text. No effect on PRA.
STD DEP 7.7-23 Automatic Traversing Incore Probe (ATIP) Function	Gain adjustment factors for Local Power Range Monitoring uses inputs from the "Automatic Fixed Incore Probe (AFIP)."	Gain adjustment factors for local power range monitoring are provided by an Automatic Traversing Incore Probe (ATIP).	Clarification to text. No effect on PRA.
STD DEP 7.7-24 Steam Bypass and Pressure Control Interfaces	An external signal interface for the Steam Bypass and Pressure Control (SB&PC) System is narrow range dome pressure signals from SB&PC System to the Recirculation Flow Control System.	Narrow range dome pressure signals are replaced by "Validated dome pressure signals." Based on pressure demand, the SB&PC System calculates position error and servo current for each turbine valve.	Corrections to text. No effect on the PRA.
~~STD DEP 7.7-25~~ ~~Fuel Pool Cooling and Cleanup Logic~~			

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 7.7-27 RCIS Table Deletion	Table 7.7-1 provides the environmental conditions for the Rod Control and Information System (RCIS) module operation environment.	Table 7.7-1 is deleted because its information is duplicated elsewhere in the FSAR.	Corrections to text. No effect on the PRA.
STD DEP 8.2-1 Electrical Equipment Numbering	--	The non-safety and safety-related medium voltage buses numbering conventions were changed. Figure 8.2-1, Sheets 1-7, have been revised to show the new bus numbers and equipment location in the turbine building.	Clarification to text. No effect on PRA.
STD DEP 8.3-1 Plant Medium Voltage Electrical System Design	Only 6.9kV; ESF busses fed directly from UAT and RAT.	Two medium voltage systems 13.8 kV/4.6 kV. PG buses changed to 13.8 kV. Class 1E and PIP buses changed to 4.16 kV. Two Reserve Auxiliary Transformers (RATs). 13.8 kV Combustion Turbine Generator with increased rating (20 Mwe). Emergency Diesel Generator changed to 4.16 kV, rating increased to 7200 kW. Larger RATs and Unit Auxiliary Transformer. Larger capacity Main Power Transformer.	Yes, a delta-PRA assessment was performed to system fault trees on Figure 19D6.11, 12, & 13; and incorporated into various sections of Chapter 19 that refers to the condensate pump and condensate booster pump being able to connect to CTG. See 19.3, 19.7.3, 19K Tables, 19L.8, Table 19L-9]
STD DEP 8.3-3 Electrical Site-Specific Power and Other Changes	--	Site specific changes include diesel generator loading calculations for sizing and drawing single lines to add site-specific power centers and motor control centers.	Clarification to text. No effect on PRA.

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 8A-1 Regulatory Guidance for Lightning Protection	--	This change acknowledges availability of SRP and regulatory guidance for the lightning protection system.	Clarification to text. No effect on PRA.
STD DEP 9.1-1 Fuel Handling Cranes and Equipment	Tier 2 (FSAR/DCD) - Paragraph 9.1.2.1.2 fuel storage racks provided in spent fuel storage for 270% of one full core fuel load, which is equivalent to a minimum of 2354 fuel storage positions (assembles).	Fuel storage racks in spent fuel pool shall be 270% of one full core fuel load, which is equivalent to a minimum of 2354 assemblies. Pool design is capable of 3072 assemblies and at STP's option more racks can be provided as extra scope. DCD should be the basis for minimum racks.	No effect on the PRA, not modeled.
STD DEP 9.2-1 Reactor Building Cooling Water System	RCW heat exchanger design capacity for divisions A and B of 47.73 GJ/h; the capacity for division C is 44.38 GJ/h.	RCW heat exchanger design capacity for divisions A and B of 50.1 GJ/h; the capacity for division C is 46.1 GJ/h. These increased capacities are based on meeting LOCA heat loads with a margin of 20% to allow for fouling.	Clarification to text. No direct effect on PRA.
STD DEP 9.2-2 Makeup Water Preparation System	--	Changes specific to the operation of the Makeup Preparation Water (MWP) System including flow capacity, storage capacity, rate for providing dematerialized water, supply makeup water to the ultimate heat sink, etc.	No effect on the PRA, not modeled.

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 9.2-3 Turbine Building Cooling Water Syste	The heat removal capacity of each of the three heat exchangers in the Turbine Building Cooling Water System is 68.7 GJ/h with a flow rate of 3405 m3/h.	The heat removal capacity of each of the three heat exchangers in the Turbine Building Cooling Water System is increased to 114.5 GJ/h, using the increased flow rate of 4550 m3/h.	No effect on the PRA, not modeled.
STD DEP 9.2-5 Reactor Service Water (RSW) System	In the DCD, only the portion of the RSW in the CB was described. Remaining portion is not defined in the DCD (Paragraph 9.2.15).	RSW system design reflects new location of RSW pump house and increased system flow and discharge pressure necessary to meet the increased heat removal requirements of the reactor cooling water system.	Included in the delta PRA [See 19.3, 19.4, 19.8, 19.9, 19.11, 19K.3, 19L.11.1, Tables 19K-1 through 19K-44, 19Q, and 19R].
STD DEP 9.2-7 HVAC Normal Cooling Water System	--	This design change corrects inconsistencies in Tables 9.2-6 and 9.2-7, and Figure 9.2-2 such that the non-safety-related HVAC Normal Cooling Water (HNCW) system waterside heat removal rate is greater than or equal to the airside cooling duty heat loads.	No effect on the PRA, not modeled.
STD DEP 9.2-8 Potable and Sanitary Water System	--	The potable water subsystem is capable of supplying both STP 3&4 and the sewage treatment subsystem is capable of treating sanitary wastes collected from all four units located at the site.	No effect on the PRA, not modeled.
STD DEP 9.2-9 HVAC Normal Cooling Water	--	Departure reduces equipment, piping, valve sizes, and electrical power for better maintainability, and changes return temperature from 12ºC to 14.7ºC.	No effect on the PRA, not modeled.

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 9.2-10 Turbine Service Water	--	Turbine Service Water (TSW) system interface requirements are revised to reflect site specific information.	No direct effect on PRA. Turbine building flooding tables associated with TSW modified to reflect site specific information. [See 19R]
STD DEP 9.3-1 Radwaste Drain Materials	Carbon steel pipe for majority of K11 Radioactive Drain System.	Stainless Steel for entire K11 Radioactive Drain system.	No effect on the PRA, not modeled.
STD DEP 9.3-2 Separate Breathing Air System	Breathing air system is included in service air system (P51).	Separate breathing air system (P81) from service air system (P51).	No effect on the PRA, not modeled.
STD DEP 9.3-3 Reactor Building Sampling Station	CRD water sampling is described in the DCD.	Because CRD system water is supplied from condensate water, CRD system sampling can be substituted by condensate system sampling. The condensate system monitors oxygen and conductivity. Process samples from the CRD are not needed.	No effect on the PRA, not modeled.
STD DEP 9.4-1 Service Building HVAC System	--	The HVAC System is revised to remove the provisions for toxic gas monitors and the TSC alarm for high toxic gas concentration.	No effect on the PRA, not modeled.
STD DEP 9.4-2 Control Building HVAC System	--	The control building HVAC system smoke removal mode is revised to include control room main air supply duct bypass lines around the air-handling unit with two motor operated dampers for each of the two control room habitability area HVAC divisions and each of the three safety-related equipment HVAC areas.	No effect on the PRA, not modeled.

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 9.4-3 Service Building HVAC System	Service building HVAC system has two subsystems, the clean air HVAC System and the Controlled Area HVAC System.	Subsystems are deleted and consolidated to supply air to both the Clean Area and the Controlled Area.	No effect on the PRA, not modeled.
STD DEP 9.4-4 Turbine Island HVAC System	--	Design changes include: additional supply/exhaust air flow, relocated electrical building into turbine building, increase in equipment quantities, additional condensate booster pumps, etc.	No effect on the PRA, not modeled.
STD DEP 9.4-5 Radwaste Building Ventilation	--	Eliminated HVAC equipment supporting the adwaste incinerator which was deleted. A dedicated air conditioning system for electrical, HVAC equipment rooms and other areas was added as a result of design evolution. Operation control of the exhaust air system form radwaste process area is augmented to automatically route the exhaust air through filtration equipment upon detection of airborne radioactivity.	No effect on the PRA, not modeled.
STD DEP 9.4-6 Control Building HVAC System	One flow element/flow switch in the common discharge duct of each emergency filtration unit.	A flow element/flow switch is to be installed on the discharge side of each emergency filtration unit fan using a two out of two logic signal for automatic switchover.	No effect on the PRA, not modeled.

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 9.4-7 Control Building Annex HVAC	MG set rooms are ventilated by C/B safetyrelated equipment area HVAC; cooling is provided by non-safety-related MG set room air handling unit.	MG set room air handling unit is independent of from C/B safety related equipment area HVAC.	No effect on the PRA, not modeled.
STD DEP 9.4-8 Reactor Building HVAC System	--	Configuration of fans and air conditioning units (ACU) in Figure 9.4-3 modified because current configuration is inconsistent with Tier 1 Figure 2.15.5j. Fire damper is stated in Tier 2 9.4.5.5.2, but Tier 1 Figure 2.15.5i has no Fire Damper- the statement of Fire Damper in Tier 2 is eliminated.	No effect on the PRA.
STD DEP 9.4-9 Turbine Building HVAC	--	The Turbine Building's exhaust system is changed and its HVAC recirculation duct is deleted.	No effect on the PRA, not modeled.
STD DEP 9.5-1 Diesel Generator Jacket Water Cooling Water System	Inspection and Testing requirements for the diesel generator jacket cooling water system conformed to RG 1.108.	The requirements have been integrated onto RG 1.9 Rev.4, endorsing IEEE-387, which addresses qualification and periodic testing of the diesel generators.	No effect on the PRA.
STD DEP 9.5-2 Lower Drywell Flooder Fusible Plug Valve	Contains specific design details about fusible plugs based on an old design concept and patent application; however the fusible plugs were never built or tested to this design.	The fusible plugs are described in generic terms of the design requirements and incorporate design experience from actual design and test results. Clarifications are made specifying the fusible plug opening temperature, lower drywell isolation valve details, etc.	The change incorporates design experience which should decrease the likelihood of failure. No effect on the PRA, but described in Chapter 19. [See 19E, 19E.2.8.2.1, 19E.2.8.2.6]

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 9.5-3 System Description - Reactor Internal Pump Motor	MG sets and adjustable speed drives described in DCD 9.5.10.2 and 7.7.1.3.	Several changes to the technical description of the non-safety Motor-Generator (MG) sets and ASD descriptions.	No effect on the PRA, not modeled.
STD DEP 9.5-4 Lighting and Servicing Power Supply System	Mercury lamps are provided for use for high ceilings, except where breakage could introduce mercury into the reactor coolant system.	The mercury lights are replaced with high pressure sodium (HPS) lamps.	No effect on the PRA, not modeled.
STD DEP 9.5-6 Diesel Generator Fuel Oil Storage and Transfer System	--	The sample connection for the Fuel Oil Storage Tank is relocated slightly above grade elevation, fill connection is relocated at grade elevation and vent is extended to an elevation exceeding maximum flood level. The Fuel Oil Storage Tanks are relocated in concrete vaults underground, with piping routed underground. Locked, closed isolation valves have been added to the fill and sample lines, and a second transfer pump for the Diesel Generator Fuel Oil system has been added.	Not explicitly modeled in the PRA. Potential beneficial effect (two fuel oil transfer pumps) for plant-specific PRA.
STD DEP 9.5-7 Fire Protection - House Boiler Area of the Turbine	The house boiler is a fuel oil-heated boiler.	The house boiler is an electrically heated boiler.	Slight positive effect on Turbine Building frequency. No effect on PRA fire modeling.

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 10.1-1 Turbine Pressure Description	Inlet pressure at the turbine main steam valves is controlled by the pressure regulator such that turbine inlet pressure varies linearly with reactor power level.	The inlet pressure at the turbine main steam valves reflects reactor power, steam line flow and pressure regulator programming, but never exceeds the pressure for which the turbine components and steam lines are designed."	No effect on the PRA, not modeled.
STD DEP 10.1-2 Steam Cycle Diagram	Steam and power conversion system consists of four condensate pumps, two heater drain tanks, a typical multi-pressure condenser design, and a main turbine with the single stage reheat.	Four condensate booster pumps are added to this system, with three filters and six emineralizers, four reactor feed pumps, four heater drain pumps, one heater drain tank, and a turbine design with two stages of reheat.	No effect on PRA. [See STD DEP 10.4-5]
STD DEP 10.1-3 Rated Heat Balance	--	Modified to reflect turbine manufacturer.	No effect on the PRA, not modeled.
STD DEP 10.1-4 Valves Wide Open Heat Balance	--	Modified to reflect turbine manufacturer.	No effect on the PRA, not modeled.
STD DEP 10.2-1 Turbine Design	--	Modified to reflect turbine manufacturer, revised ISI and IST inspection intervals based on design.	No effect on the PRA, not modeled.
STD DEP 10.2-2 Turbine Rotor Design	--	Modified to reflect turbine manufacturer.	No effect on the PRA, not modeled. Turbine missile generation likelihood decreased.
STD DEP 10.2-3 Turbine Digital Control	--	Significant advancements in reliability and machine protection result through the use of a digital turbine control system.	No effect on the PRA, not modeled. Turbine trip function reliability enhanced.

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 10.2-4 Bulk Hydrogen Storage	Bulk hydrogen is stored near the turbine building.	Bulk hydrogen is stored well away from the power block buildings.	No effect on the PRA, not modeled.
STD DEP 10.3-1 Main Steam Line Drains	The drains from the steam lines inside containment are connected to the steam lines outside the containment to permit equalizing pressure across the MSIVs during startup and following steam line isolation.	The main steam system also serves as the "alternate leakage path" to contain the radioactive steam with passes the main steam isolation valve before they close to isolate the reactor under emergency conditions.	No effect on the PRA, not modeled.
STD DEP 10.4-1 Turbine Gland Seal Steam	--	A non-safety-related Gland Seal Evaporator (GSE) is added to the Turbine Gland Steam System to supply sealing steam to the main turbine shaft seal glands and various turbine valve stems, including the turbine bypass and main turbine stop-control valve stems.	No effect on the PRA, not modeled.
STD DEP 10.4-2 Main Condenser	MC utilizes three independent multi-pressure single-pass shells, with each shell containing at least two tube bundles, and series circulating water flow.	MC utilizes three condenser shells crossconnected to equalize pressure, with each shell containing four tube bundles, and parallel circulating water flow. Number of circulating water pumps increased to 4, flow rates modified.	Editorial changes in Chapter 19. [See 19R.4.3, 19R.5.3]
STD DEP 10.4-3 Main Condenser Evacuation System	Auxiliary boiler steam used for steam jet air ejectors during startup.	An additional vacuum pump is added and changes to the source of motive steam supplying the steam jet air ejectors during power operation.	No effect on the PRA, not modeled.
~~STD DEP 10.4-4 Condensate Purification System~~			

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 10.4-5 Condensate and Feedwater System	3 Variable Speed (ASD driven) Reactor FW Pumps (booster and main pump), 33-67% NBR capacity and a Flow Control Valve in HP Heater Bypass line for startup/shutdown reactor level control. Normal rated power operation is with all 3 MD Reactor FW Pumps operating. If one operating Reactor Feedwater Pump trips, the other 2 operating reactor FW pumps must increase speed and discharge flows to maintain rated power operation. FWCS design for DCD is based upon above FW system design.	4 Variable Speed (ASD driven) Reactor FW Pumps and 4 condensate booster pumps. Low Flow Control Valve that provides for level control during startup/shutdown. Normal rated power operation is with 3 MD Reactor FW Pumps operating and one in auto standby. If one operating Reactor FW Pump trips, the Reactor FW Pump in auto start is not successful, automatic power reduction (by recirculation runback) occurs to avoid reactor scram.	Editorial change to the PRA to reflect the addition of the condensate booster pumps. [See 19.1, 19.3, 19.9, 19L, and 19Q]
STD DEP 10.4-6 Load Rejection Capability	ABWR Standard design has a turbine bypass capacity of 33% of nuclear boiler rated flow.	A clarification is made in regards to reactor trip resulting from turbine trip or generator load rejection from power levels above 33%.	Clarification to text. No effect on PRA.
STD DEP 10.4-7 Turbine Bypass Hydraulic Control	--	Indication for the use of valve position transmitters, one hydraulic accumulator for each bypass valve, the addition of the fastacting solenoid valve, and the interface etween the steam Bypass and Pressure Control System for positioning of the bypass valves.	No effect on the PRA, not modeled.

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 11.2-1 Liquid Radwaste Process Equipment	--	Information is replaced completely due to a change in the design of the liquid radioactive waste system. The liquid radwaste system is composed of three subsystems designed to collect, treat, and recycle or discharge different categories of waste water; the low conductivity subsystem, high conductivity subsystem, and detergent waste subsystem.	No effect on the PRA, not modeled.
STD DEP 11.3-1 Gaseous Waste Management System	Off-gas is exhausted along with SJAE discharge pressure, (needing the addition of vacuum pumps for stable exhaust during plant operation). Additionally, an integrated recombiner (combining the preheating unit and condensate unit) is applied.	Off-gas is exhausted along with SJAE discharge pressure, using vacuum pumps to stabilize exhaust during plant operation. Additionally, the recombiner has a preheating unit and condensate unit (each as a separate unit).	No effect on the PRA, not modeled.
STD DEP 11.4-1 Radioactive Solid Waste Update	--	Solidification System and the incinerator system are deleted because equipment operations and maintenance difficulties negatively impact the effectiveness of these processes. A second spent resin storage tank is added for separating two different resins. The SWMS mobile system consists of equipment modules, complete with all subcomponents, piping and instrumentation and controls necessary to operate the subsystem.	No effect on the PRA, not modeled.

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 11.5-1 Process and Effluent Radiation Monitoring and Sampling System	--	Implementation of specific equipment is vendor-based. Specific detector types will be selected at a later date based on the state of art and availability. Many additional changes have been made.	No effect on the PRA, not modeled.
STD DEP 12.3-1 Cobalt Content in Stainless Steel	--	Vendors supplying the materials cannot reasonably achieve the cobalt limits in all cases, so a graded approach is used to specify locations receiving the least.	No effect on the PRA, not modeled.
STD DEP 12.3-2 Deletion of CUW Backwash Tank Vent Charcoal Filter	The CUW vent for CUW backwash is fitted with a charcoal filter canister to reduce the omission of radioiodines into the plant atmosphere.	The CUW system contains charcoal filter on its vent. The CUW backwash tank is vented into the reactor building HVAC System exhaust, exiting the plant via the plant stack as monitored release.	No effect on the PRA, not modeled.
STD DEP 12.3-3 Steam Tunnel Blowout Panels	The blowout panels for the steam tunnel are located in the relatively inaccessible section of the RHR heat exchanger shielded cubicle which are controlled access areas.	The design does not have blowout panels in the steam tunnel. The main steam tunnel is vented to the turbine building.	No effect on the PRA, not modeled.
STD DEP 12.3-4 Alarm Capability for Area Radiation Monitors (ARMs)	--	The ARMs will have alarm capability andNo effect on the PRA, not modeled. five additional monitors are required in the Reactor Building.	No effect on the PRA, not modeled.

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 14.2-1 Control Rod Drive Friction Testing Requirement	--	Normal control rod positioning is accomplished by an electrical motor. Mechanical binding of a CRD will result in blade separation from the ball nut which would be detected by permanently installed instrumentation. The CRDs are easily monitored for performance degradation during normal withdrawal; therefore periodic friction testing is not required.	No effect on the PRA, not modeled.
STD DEP 16.2-1 thru STD DEP 16.5-4 Technical Specifications Changes	See COLA Part 7 for changes.	See COLA Part 7 for changes.	No effect on the PRA, not specifically modeled.
STD DEP 18.4-1 Main Generator Synchronization Control Relocation	--	The controls required for the synchronization of the main generator have been relocated from the control console to the main control panel.	No effect on the PRA, not modeled.
STD DEP 19.3-1 Evaluation of Common Cause Failures	ABWR SSAR Chapter 19D.8.6 documents the results of a PRA sensitivity analysis on common cause failure of selected mechanical systems performed by GE.	Common cause factors were added to the ABWR plant model used to quantify the effects of plant-specific factors for South Texas Project Units 3 & 4 PRA.	Included in delta PRA assessment. [See Chapter 19.3]

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
STD DEP 19.7-1 Control Rod Drive Improvements	The FMCRD brake design has to be fully testable on an annual basis.	The FMCRD electro-mechanical brake is a Class 1E safety related component with a 10- year Environmental Qualification replacement life; brake performance characteristics testing is performed every to years when a replacement brake is installed. Hitachi recommends approximately 20 motor sub-assembly units, including the brake, to be tested during the 18-month refueling outages.	Editorial change to Chapter 19. [See Chapter 19.7.2]
STD DEP 19I.7-1 Atmospheric Control System Bypass Analysis	The seismic margins PRA for the Atmospheric Control System 50 mm crosstie valves requires the opening of two normally closed motor-operated valves to create a containment bypass path.	The analysis has been modified by replacing motor-operated valves with air-operated valves.	Editorial change to Chapter 19. [See Chapter 19I.7]
STP DEP 19R-1 RSW Pump House Redesign	ABWR design, vertical RSW pumps, pump rooms protected from flooding from other pump rooms, pumps above water level in UHS.	STP design, RSW pumps located below UHS, pump rooms are protected by watertight doors between trains.	Control building flooding assessment is unaffected, RSW design modified for new RSW pump house design, vacuum breakers removed. [See 19R]. A delta-PRA assessment for flooding in redesigned RSW pump house [See 19.4, 19.8, 19.9, 19.11, 19K, 19Q, and 19R]

Table 19.2-2 PRA Assessments of STP COLA Departures from ABWR DCD (Continued)

Departure Number	Certified Design Basis(DCD)	US ABWR/STP Design Bases	Potential Impact on PRA [STP COLA Section]
OTHER			
Site Specific Requirement UHS System Design	Spray Pond UHS with specific RBCW/TBCW, etc., in/out temperatures given based on generic site.	The UHS function is provided by mechanical draft cooling towers, which are sized to satisfy the results of temperature studies to confirm they are within envelopes specified in ABWR DCD design. One UHS and RSW pump house for each unit.	No direct effect in the PRA. [See STP DEP 19R-1 for RSW pump house flooding]