19.2 Introduction

The information in this section of the reference ABWR DCD, including all subsections, tables and figures, 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. Table 19.2-2 lists the changes identified as design certification document changes or revised SSC design definitions with potential PRA impact. 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 Design Certification Document PRA Assessments

Certified Design (DCD) Bases	US ABWR/STP Design Bases	STP COLA PRA Potential Adverse Change (Yes/No) and assessment discussion	Site Specific (SS) or Standard (Generic)
RCIC-Terry type turbine	RCIC-Weir (TWL) type turbine	Yes, a delta-PRA assessment of fault tree and COL information item update, as well as an evaluation update review to the system fault tree in 19D was performed	Standard
Two 50% (1% FW flow) pumps	Two 100% (2% FW flow) pumps	No, not modeled in PRA.	Standard
S & N are defined for safety and non-safety respectively	S-Safety, N-Non-safety [N is divided in to two categories as NR-Reliability and NG-Generic grade (See STP QAR-1 for details)])	No, 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.	SS
No T-49 system (Tier 2, Sec. 6.2.5.2.1)	No T49 system/H_2 Recombiners	No, FCS is not modeled in PRA	Standard
H_2/O_2 Analyzer (Tier 1 Sec. 2.3.3) Class 1E safety related	H_2/O_2 analyzer will be downgraded to non-safety related	No, not modeled in PRA.	Standard
R-40–CTG electrical tie to 6.9 kV	R-40–CTG electrical tie to 13.8 kV	Yes, an update review of the CTG tie-in to electrical distribution system was performed, also see item on “Medium Voltage Electrical Distribution” below.	Standard

Table 19.2-2 Design Certification Document PRA Assessments (Continued)

Certified Design (DCD) Bases	US ABWR/STP Design Bases	STP COLA PRA Potential Adverse Change (Yes/No) and assessment discussion	Site Specific (SS) or Standard (Generic)
RBSW & RBCW with 3 mech & elect separate divisions. RBSW only described the portion of the system in the CB. Remaining portion is not defined in the DCD (Para. 9.2.15). TBCW/TBSW are non-safety systems and serve no safety function. (Tier 2 Sec. 9.2)	RBSW & RBCW with 3 mech & elect separate divisions. TBCW/TBSW are non-safety systems and serve no safety function. (Tier 2 Sec. 9.2). However, pump and system capacity data shall be based on (STP site-specific, if higher than ABWR DCD) per available water temp and source.	Yes, an update review was performed to the service water system fault tree, system operation descriptions in Ch. 19 and 19.10, as well as, an update to the fault tree on RBSW in Figure 19D.	SS
DCD per DCD Table 1.8-21 (e.g., ASME III per 1989 Edition)	STP will be based on ASME III per 1989 Edition	No, 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.	Standard
The Civil design is based on ASME B&PV Code Section III Division 2-1989, ACI 349-980, ACI 318-1989 and 1991 Uniform Building Code	The Civil design will be based on ASME B&PV Code Section III Division 2-2004, ACI 349-1990, ACI 318-2002 and 2003 International Building Code.	No, 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.	Standard
Tier 1 - Minimum of 270% of the reactor core. Tier 2 (FSAR/DCD) - Para. 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 (assemblies).	Fuel storage racks in spent fuel storage 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, uses the same number of racks and sizing for a larger pool size.	Standard

Table 19.2-2 Design Certification Document PRA Assessments (Continued)

Certified Design (DCD) Bases	US ABWR/STP Design Bases	STP COLA PRA Potential Adverse Change (Yes/No) and assessment discussion	Site Specific (SS) or Standard (Generic)
Breathing air system is included in Service air system (P51)	Separate breathing air system (P56) from Service air system (P51)	No, not modeled in PRA	Standard
Tier 1 - Only 6.9kV; ESF busses fed directly from UAT and RAT	Two medium voltage systems 13.8 kV/4.6 kV	Yes, a delta-PRA assessment of updates was needed to system fault trees on Figure 19D6.11, 12 and 13 and incorporated into various sections of SSAR chapter 19 that refers to the condensate pump being able to connect to CTG.	Standard
Design included MSIV trip on high radiation in steam tunnel (Tier 2)	No MSIV trip on high radiation in steam tunnel	No, not modeled in the PRA.	Standard
Control Building	Control Building Annex	Yes, a Delta-PRA assessment of updates review performed to FIRE PRA ignition sources data sheets (ISDS)	Standard
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 being sized to satisfy the results of temperature studies to confirm they are within envelopes specified in ABWR DCD design, no deviations from the ABWR DCD will be required and the Lungmen design can be applied to STP.	Yes, refer to UHS and RBSW in Service water/Cooling water systems” item above	SS

Table 19.2-2 Design Certification Document PRA Assessments (Continued)

Certified Design (DCD) Bases	US ABWR/STP Design Bases	STP COLA PRA Potential Adverse Change (Yes/No) and assessment discussion	Site Specific (SS) or Standard (Generic)
3 Variable Speed (ASD Driven) Motor Driven (MD) Reactor Feedwater (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) Motor Driven (MD) Reactor FW Pumps (booster and main pump), and Low Flow Control Valve (LFCV) that provides for level control during startup/shutdown (i.e. can receive inlet flow via bypass line or from one of two MD reactor FW pumps, typically operated at speed when using the LFCV for automatic 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 standby will auto start to maintain rated power operation. If the auto start is not successful, automatic power reduction (by recirculation runback) occurs to avoid reactor scram. STP FWCS is to be designed based upon above FW design. [NOTE: STP COLA for Chapter 10 requires many basic changes from the DCD Chapter 10 reference design, including significant changes to the condensate and feedwater system design.]	Yes, a delta-PRA assessment of updates was performed using the updated system/structure/ component design.	SS
Single Unit	Dual Units	PRA review for impact on common fire protection system was performed in 19M.	Standard

Table 19.2-2 Design Certification Document PRA Assessments (Continued)

Certified Design (DCD) Bases	US ABWR/STP Design Bases	STP COLA PRA Potential Adverse Change (Yes/No) and assessment discussion	Site Specific (SS) or Standard (Generic)
The details of the Post Accident Monitoring System (PAM) and Post Accident Sampling System (PAS) does 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, not modeled in PRA.	Standard
Refueling equipment design based on equipment being used at the time of the ABWR Certification submittals	Design will be based on detailed equipment design and most recent refueling equipment and technology	No, not modeled in PRA.	Standard
Carbon steel pipe for majority of K11 Radioactive Drain System	Stainless steel for entire K11 Radioactive Drain System	No, not modeled in PRA.	Standard
The ABWR DCD has the EDG Starting Air Compressors are classified as Class 1E however, Question 430.271 in the ABWR SSAR addresses the NRC's position regarding the classification of the starting air compressors and states the following: "The staff agrees with GE that the keep-warm heaters and associated pumps of the diesel generator lubrication system and the air compressors and motors of the diesel generator starting air system need not be nuclear safety class"	The EDG Starting Air Compressors (motor) will be classified as Class 1E and will be connected to the Class 1E busses.	No, not modeled in PRA.	Standard
DCD gave specific relief valve setpoints	Setpoints to be based on including 15% simmer margin.	No, not modeled in PRA.	Standard

Table 19.2-2 Design Certification Document PRA Assessments (Continued)

Certified Design (DCD) Bases	US ABWR/STP Design Bases	STP COLA PRA Potential Adverse Change (Yes/No) and assessment discussion	Site Specific (SS) or Standard (Generic)
3 motor-driven FW pumps	Four motor-driven FW pumps. Class 1E Breakers to trip condensate pumps may be required based on containment analysis.	Yes, it was determined a delta-PRA assessment of updates was required using the updated system/structure/ component design.	Standard
One battery, one charger, one main panel per division	One battery, two chargers, isolation breaker, DC bus per division as the design.	Yes it will improve the system performance and availability.	Standard
Environmental Conditions, IEEE 382 conditions	Reduced 100 days to 30 days containment spray and spray density and faster temp rise time	No, not modeled in PRA.	Standard
Below grade	Probably several meters above grade, exact elevation to be determined	Yes, a delta-PRA assessment of updates was performed using the site characteristics and updated system/structure/component design to mitigate external flooding.	SS
The ABWR DCD describes the essential multiplexing system as a dual ring architecture that complies with several ANSI Standards that define the FDDI protocol.	The STP design will be based on revised essential multiplexing system design which does not follow the FDDI standards and the RTIF portion of it is not a dual ring architecture. This was done to utilize nuclear-proven, commercially available 1E networks while still satisfying the technical intent behind specifying FDDI and dual redundant ring. That intent was that the network be deterministic.	Yes, a delta-PRA assessment of updates was performed based on a screening of the changes that could affect the instrument fault trees in 19D	Standard

Table 19.2-2 Design Certification Document PRA Assessments (Continued)

Certified Design (DCD) Bases	US ABWR/STP Design Bases	STP COLA PRA Potential Adverse Change (Yes/No) and assessment discussion	Site Specific (SS) or Standard (Generic)
The ABWR DCD inconsistently describes and 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 control logic.	The STP design limits the application of the dual train SLU architecture to the limited set of ESF functions. It also allows RMUs 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.	Yes, a delta-PRA assessment was performed to assess the updates affect on the instrument fault trees and common cause failures of the E MUX and the 19D fault trees and 19N CCF.	Standard
Turbine first stage pressure signal is used as an interlock for bypassing the RPS trips from turbine stop valve or control valve oil pressure	Design of the interlock has been changed to reactor thermal power.	No, value of setpoint does not change.	Standard
The ABWR has two RHR loops connected to the FPCCS with normally closed interties to permit supplemental cooling during refueling outages	The STP Design will have three RHR loops connected to the FPCCS with normally closed inter-ties to permit additional supplemental cooling during refueling outages to reduce outage time.	No, 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	Standard
Three divisions (Div I, II, and III)	Four Divisions R14 Div I, II, III, and IV	No, it is expected to improve reliability however it was determined to review the addition of a fourth division of instrument and control power to confirm there are no adverse impacts.	Standard