

8.0 Electric Power

8.1 Introduction

The information in this section of the reference ABWR DCD including all subsections and tables is incorporated by reference with the following departures and a supplement.

STD DEP T1 2.4-2

STD DEP T1 2.12-2

STP DEP 1.1-2 (Table 8.1-1)

STD DEP 1.8-1

STD DEP 8.3-1

The plant medium voltage electrical system alternate design description was provided in ABWR Licensing Topical Report (LTR) NEDO-33335, "Advanced Boiling Water Reactor (ABWR) Plant Medium Voltage Electrical System Design," dated May 2007. Marked-up DCD pages 8.1-1 through 8.1-6 of this LTR are incorporated by reference.

8.1.1 Offsite Transmission Network

The description of the offsite transmission network is out of the ABWR Standard Plant scope, however there are interface requirements contained in Section 8.2.3 which must be complied with by the COL applicant.

The following supplement provides site specific information on the interface between the offsite transmission network and STP 3 & 4.

The transmission service providers for STP 3 & 4 are CenterPoint Energy, AEP Texas Central Company (TCC), and City Public Service Board of San Antonio (CPS). The combined electrical grids of the three systems presently consist of interconnected fossil fuel plants which serve approximately 51,354 square miles with an overlaid 345/138/69 kV transmission system.

The three transmission service providers are members of the Electric Reliability Council of Texas (ERCOT). ERCOT consists of members engaged in generation, marketing, transmission, or distribution of electric energy within the State of Texas. ERCOT is the Independent System Operator (ISO), which oversees all generation and transmission functions.

The 345 kV switchyard at STP Units 3 & 4 has six 345 kV transmission circuits which connect it to the three transmission service providers' transmission system. Two of the 345 kV transmission circuits connect to CenterPoint Energy's Velasco substation and Hillje 345 kV switchyard. One of the 345 kV transmission circuits directly connects STPEGS and CPS's Elm Creek 345 kV switchyard near San Antonio, Texas. Two of the 345 kV transmission circuits connect to TCC's White Point 345 kV substation and

the Blessing 345 kV autotransformer. The remaining TCC 345 kV circuit connects to the STP 1 and 2 switchyard via a tieline (with a series reactor).

8.1.2 Electric Power Distribution System

8.1.2.0 Definitions

STD DEP 1.8-1

Safety-related—Any Class 1E power or protection system device included in the scope of IEEE-279603 or IEEE-308. (This term is explicitly defined in IEEE-100, though not in IEEE-308.) Note that “safety-related” includes both electrical and non-electrical equipment, whereas “Class 1E” pertains only to electrical equipment (i.e., any equipment which has an electrical interface).

8.1.2.2 Description of Onsite AC Power Distribution System

STD DEP T1 2.12-2

The Class 1E 120 VAC instrument power system, Figure 8.3-2, provides for Class 1E plant controls and instrumentation. The system is separated into Divisions I, II, and III, and IV with distribution panels and local control panels fed from their respective divisional sources, except Division IV is fed from the Division II source.

8.1.3.1.1.1 Onsite Power Systems - General

STD DEP T1 2.4-2

The Class 1E 6.9 kV Divisions I, II, and III switchgear buses, and associated 6.9 kV diesel generators, the safety-related 13.8 kV breakers (to trip condensate pumps in case of feedwater pipe break), 480 VAC distribution systems, and Divisions I, II, III and IV, 120 VAC and 125 VDC power and control systems conform to Seismic Category I requirements. This equipment is housed in Seismic Category I structures except for some control sensors associated with the Reactor Protection System [Subsection 9A.5.5.1], and the Leak Detection System [Subsection 9A.5.5.7], and the safety-related 13.8 kV breakers (Subsection 8.3.1.1.1). Seismic Qualification is in accordance with IEEE-344 (Section 3.10).

8.1.3.1.2.1 General Design Criteria

STP DEP 1.1-2

- (3) GDC 5 - Sharing of Structures, Systems and Components

~~The ABWR is a single unit plant design. Therefore this GDC is not applicable.~~
STP 3 & 4 is a dual-unit station. GE Licensing Topical Report (LTR) NEDO-33325, dated May 2007, titled "Common Equipment and Structures" addresses the sharing of structures, systems and components important-to-safety between the two units. The LTR demonstrates that GDC 5 is met for a standard dual unit configuration.

8.1.3.1.2.2 NRC Regulatory Guides

STP DEP 1.1-2

- (7) RG 1.81 - Shared Emergency and Shutdown Electric Systems for Multi-Unit Nuclear Power Plants

~~The ABWR is designed as a single unit plant. Therefore, this Regulatory Guide is not applicable.~~ STP 3 & 4 is a dual-unit station. GE Licensing Topical Report (LTR) NEDO-33325, dated May 2007, titled "Common Equipment and Structures" addresses the sharing of structures, systems, and components important to safety between the two units. The LTR demonstrates that RG 1.81 is met for a standard dual unit configuration.

8.1.4 COL License Information

8.1.4.1 Diesel Generator Reliability

The following standard supplement addresses COL License Information Item 8.1.

Procedure(s) to monitor onsite emergency diesel generator performance in accordance with the recommendations of NUREG/CR-0660 "Enhancement of On-site Emergency Diesel Generator Reliability," will be developed before fuel load to obtain improved performance and better reliability from the standby emergency diesel generators. Training will also be developed for maintenance personnel and other appropriate plant personnel in the proper operation and maintenance of the standby emergency diesel generators. These procedures will be developed consistent with the plant operating procedure development plan, which was provided to the NRC in ABWR Licensing Topical Report (LTR) NEDO-33297, dated January 2007, titled "Advanced Boiling Water Reactor (ABWR) Procedures Development Plan." (COM 8.1-1)

Table 8.1-1 Onsite Power System SRP Criteria Applicable Matrix

Applicable Criteria	Ref. IEEE Std	Offsite Power System	AC Power Systems (Onsite)	DC Power Systems (Onsite)
GDC 5 * GDC 5			X	X
RG 1.81 * RG 1.81			X	X

~~* Multi-unit plants only; not applicable to single-unit ABWR~~