Pacific Gas and Electric Company®

Diablo Canyon Power Plant Units 1 and 2

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DIABLO CANYON POWER PLANT
UNITS 1 AND 2

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Chapter 1

INTRODUCTION AND GENERAL DESCRIPTION OF PLANT

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FIGURES

NOTE:

(a) This figure corresponds to a controlled engineering drawing that is incorporated by reference into the FSAR Update. See Table 1.6-1 for the correlation between the FSAR Update figure number and the corresponding controlled engineering drawing number.

CHAPTER 1

INTRODUCTION AND GENERAL DESCRIPTION OF PLANT

1.1 INTRODUCTION

The Updated Final Safety Analysis Report (UFSAR) for the Diablo Canyon Power Plant (DCPP) is submitted in accordance with the requirements of 10 CFR 50.71(e) and contains all the changes necessary to reflect information and analyses submitted to the U.S. Nuclear Regulatory Commission (NRC) by Pacific Gas and Electric Company (PG&E) or prepared by PG&E pursuant to NRC requirements since the submittal of the original FSAR.

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The original FSAR was submitted in support of applications for permits to operate two substantially identical nuclear power units (Unit 1 and Unit 2) at the DCPP site. The DCPP site is located on the central California coast in San Luis Obispo County, approximately 12 miles west southwest of the city of San Luis Obispo.

The Construction Permit for Unit 1 (CPPR-39) was issued April 23, 1968, in response to PG&E's application dated January 16, 1967 (USAEC, Docket No. 50-275). The Construction Permit for Unit 2 (CPPR-69) was issued on December 9, 1970; the application was made on June 28, 1968 (USAEC, Docket No. 50-323).

Westinghouse Electric Corporation and PG&E jointly participated in the design and construction of each unit. The plant is operated by PG&E. Each unit employs a pressurized water reactor (PWR) nuclear steam supply system (NSSS) furnished by Westinghouse Electric Corporation and similar in design concept to several projects licensed by the NRC.

Certain components of the auxiliary systems are shared by the two units, but in no case does such sharing compromise or impair the safe and continued operation of either unit. Those systems and components that are shared are identified and the effects of the sharing are discussed in the chapters in which they are described (refer to Section 1.2.2.10).

The NSSS for each unit is contained within a steel-lined reinforced concrete structure that is capable of withstanding the pressure that might be developed as a result of the most severe postulated loss-of-coolant accident (LOCA).

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The containment structure was designed by PG&E to meet the requirements specified by Westinghouse Electric Corporation.

While the reactors, structures, and all auxiliary equipment are substantially identical for the two units, there is a difference in the reactor internal flow path that results in a lower coolant flow rate for Unit 1.

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Consequently, the original license application reactor ratings were 3,338 MWt for Unit 1 and 3,411 MWt for Unit 2. The corresponding net electrical outputs were approximately 1,084 MWe and 1,106 MWe, respectively.

During the design phase, the expected ultimate output of the Unit 1 reactor was 3,488 MWt; the expected ultimate output of the Unit 2 reactor was 3,568 MWt. The corresponding NSSS outputs were 3,500 MWt and 3,580 MWt. (The difference of 12 MWt is due to the net contribution of heat to the reactor coolant system (RCS) from nonreactor sources, primarily pump heat.) The corresponding estimated ultimate net electrical outputs were 1,131 MWe for Unit 1 and 1,156 MWe for Unit 2.

The NRC issued a low power-operating license for Unit 1 on September 22, 1981. PG&E voluntarily postponed fuel loading due to the discovery of design errors in the annulus region of the containment structure. Subsequently, the NRC suspended portions of the license on November 19, 1981, pending completion of an Independent Design Verification Program.

After completion of redesign and construction activities in November 1983, the NRC reinstated the fuel load portion of the Unit 1 low power-operating license. On April 19, 1984, the NRC fully reinstated the low power-operating license, which included low power testing. The Unit 1 full power-operating license was issued on November 2, 1984. Commercial operation for Unit 1 began on May 7, 1985, with a license expiration date of April 23, 2008.

The NRC issued a low power-operating license for Unit 2 on April 26, 1985. Unit 2 fuel loading was completed on May 15, 1985. A full power-operating license for Unit 2 was issued on August 26, 1985. Unit 2 commercial operation began on March 13, 1986, with a license expiration date of December 9, 2010.

In March 1996, the NRC approved license amendments extending the operating license for Unit 1 until September 22, 2021, and for Unit 2 until April 26, 2025.

In July 2006, the NRC approved license amendments extending the operating license for Unit 1 until November 2, 2024, and for Unit 2 until August 26, 2025.

In October 2000, the NRC approved a license amendment (LA) 143 to increase the Unit 1 rated reactor thermal power from the original value of 3,338 MWt to 3,411 MWt to increase production and be consistent with Unit 2. LA 143 also documented the evaluation performed to revise the net contribution of heat to the RCS from nonreactor *sources (primarily pump heat) to a nominal value of 14 MWt and established a NSSS power outlet of 3,425 MWt for both Unit 1 and Unit 2.*

1.2 GENERAL PLANT DESCRIPTION

1.2.1 PRINCIPAL SITE CHARACTERISTICS

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED

1.2.1.1 Location

The DCPP site consists of approximately 750 acres located in San Luis Obispo County, California, adjacent to the Pacific Ocean and roughly equidistant from San Francisco and Los Angeles. The site location, the site boundary, and the location of principal structures are shown in Figure 1.2-1. The minimum distance from either reactor to the nearest site boundary on land is one-half mile, the minimum exclusion distance. The low population zone (LPZ), as defined in 10 CFR Part 100, is the area immediately surrounding the exclusion area. For DCPP, the LPZ is an area encompassed by a radius of 6 miles. This zone contains residents for whom there is reasonable probability that appropriate protective measures, as described in the DCPP Emergency Plan (Reference 1) can be taken in the event of a serious accident. The population center distance, as defined by 10 CFR Part 100, is approximately 10 miles, the distance to the nearest boundary of the city of San Luis Obispo.

1.2.1.2 Topography

The plant site occupies a coastal terrace that ranges in elevation from 60 to 150 feet above sea level and is approximately 1000 feet wide. Plant grade is at elevation 85 feet. The seaward edge of the terrace is a near-vertical cliff. Back from the terrace and extending for several miles inland are the rugged Irish Hills, an area of steep, brush-covered hillsides and deep canyons that are part of the San Luis Mountains and attain an elevation of 1500 feet within about a mile of the site. Access to the site is by a private road from Avila Beach, a distance of nearly 8 miles.

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1.2.1.3 Meteorology

The climate of the site area is typical of that along the central California coast. In the dry season, mainly May through September, the Pacific Anticyclone stays off the California coast and prevents Pacific storms from moving eastward across the state. In the winter or wet season, November through March, the Pacific Anticyclone moves southward, weakening in intensity, and allows Pacific storms to enter the state. More than 80 percent of the average annual rainfall of 16 inches occurs during this 5-month period. April and October are considered transitional months. The average annual temperature of the site area is about 55°F, which reflects the strong maritime influence.

Most stations along the coast show a 5 to 10°F mean temperature difference between the coldest winter month and the warmest summer month. Extreme temperatures may *range from 104°F in the summer to as low as 24°F in the winter. However, the recurrence interval of days having these extremes is in the order of 5 to 10 years. Maximum summer temperatures of 85°F and minimum winter temperatures of 35°F are exceeded only 1 percent of the time at both Morro Bay and Pismo Beach. Additional site temperature data are presented in Section 2.3. The onsite meteorological measurements program was initiated in July 1967. Data collected are presented in Section 2.3 and are used to establish atmospheric diffusion characteristics of the site. Severe weather conditions, such as tornadoes and hurricanes, have not been recorded in this area. Thunderstorms are also a rare phenomenon with the average occurrence of lightning being less than 3 days per year.*

1.2.1.4 Hydrology

Hydrological considerations at the plant site are limited to possible effects of plant operations on domestic water supplies and to the possibility of flooding. A survey of domestic water supplies in the environs shows that operation of the plant will not jeopardize any existing or planned facility. The topography of the site and the limited rainfall preclude any possibility of flooding.

1.2.1.5 Geology

A comprehensive geological investigation has demonstrated that the site is geologically suitable for a nuclear power plant. Foundations are on firm bedrock fully capable of carrying the loads. Movement along the few small breaks in the vicinity of the plant has not occurred for at least 100,000 years and may well have taken place millions of years ago. The site was investigated in detail for faulting and other possibly detrimental geologic conditions. Results of faulting investigations are discussed in Section 2.5.4.7 and are based on site geology data presented in Section 2.5.2.2. Landslides do not threaten the plant.

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED

1.2.1.6 Seismology

Seismological investigations were undertaken to determine the potential for earthquakes in the site area, to form a basis of the establishment of seismic design criteria, and to evaluate the adequacy of seismic design margins for the plant (refer to Section 2.5). Records indicate that seismic activity within 20 miles of Diablo Canyon has been very low compared to other parts of California. Until PG&E's seismological investigation of the Hosgri fault zone located approximately 3 miles offshore, the seismically significant fault system nearest the site was considered to be the Nacimiento Fault located about 20 miles away as discussed in Section 2.5.3.9. The largest earthquake known to have been associated with this fault system occurred at an epicentral distance to the site of about 44 miles. It is listed with a Richter magnitude 6. At its closest point, the San Andreas Fault passes some 48 miles from the site.

PG&E's reevaluation of the plant's capability to withstand a Richter magnitude 7.5 "Hosgri" Earthquake is discussed in Section 3.7.

1.2.1.7 Oceanography

Condenser cooling water for the plant is pumped from the Pacific Ocean and returned to the ocean at Diablo Cove through an outfall at the water's edge. Controlled releases of low-level liquid radioactive wastes are discussed in Section 11.2. The Pacific Ocean in the area of the site is turbulent and has a great capacity for dilution of wastes and diffusion of heated cooling water. Investigations of the occurrence and maximum size of tsunamis (seismic sea waves) coincident with high tide and with short period storm waves are discussed in Section 2.4.7. These studies showed that extreme water elevation within the intake basin without a breakwater would be 44.32 feet above mean lower low water. The intake structure houses the safety-related auxiliary cooling water systems, which are protected against tsunami and wave splash with watertight compartments. This is discussed in Section 2.4.6.7.

1.2.2 FACILITY DESCRIPTION

The plant incorporates two substantially identical PWR nuclear power units, each consisting of an NSSS, turbine-generator, auxiliary equipment, controls, and instrumentation. The general arrangement of the plant and the site is shown in Figure 1.2-1. Principal structures, shown in Figure 1.2-2, include the containment structures, turbine building, and auxiliary building (which includes the control room, the fuel handling areas, and the ventilation areas). Arrangement plans and sections are shown in Figures 1.2-3 through 1.2-32. The descriptions that follow apply to both units unless otherwise specified.

1.2.2.1 Design Criteria

The principal design criteria for the DCPP nuclear units are those fundamental architectural and engineering design objectives established for the plant. The bases for development and selection of the design criteria used in this plant are: (a) those that provide protection to public health and safety, (b) those that provide for reliable and economic plant performance, and (c) those that provide an attractive external appearance to the plant.

The essential systems and components of the plant are designed to enable the facility to withstand, without loss of capability to protect the public, the forces resulting from normal operation plus those that might be imposed by natural phenomena. The designs are based on the most severe of the natural phenomena recorded for the vicinity of the site, with margin to account for uncertainties in the historical data.

The DCPP units are designed to comply with the "General Design Criteria for Nuclear Power Plant Construction Permits," published in July 1967. A discussion of conformance to these criteria is contained in Section 3.1. In addition, a summary discussion of the designs and procedures that are intended to meet the NRC General Design Criteria published as Appendix A to 10 CFR Part 50 in 1971 is provided in Chapter 3, Section 3.1, Appendix 3.1A.

1.2.2.2 Nuclear Steam Supply System

The NSSS consists of a PWR and associated auxiliary fluid systems. The RCS consists of four parallel reactor coolant loops, each containing a steam generator and a reactor coolant pump (RCP). A pressurizer is connected to the hot leg of one reactor coolant loop.

The reactor core is composed of an array of 193 fuel assemblies, each containing 264 fuel rods. These rods are composed of uranium dioxide pellets enclosed in zirconium alloy tubes with welded end plugs. All fuel rods are pressurized with helium during fabrication to reduce stress and increase fatigue life. Reactor control and shutdown functions are performed by the rod cluster control assemblies (RCCAs). The RCCAs are stainless steel tubes containing a silver-indium-cadmium absorber and are positioned by drive mechanisms of the magnetic latch type. A soluble poison (boron) is introduced into the reactor coolant to compensate for long-term reactivity changes. The moderator temperature coefficient can be slightly positive at the beginning of cycle when boron concentration is high. However, for most operating conditions, the moderator coefficient is non-positive, but the power coefficient is negative at all times.

The reactor vessel and reactor internals contain and support the fuel and RCCAs. The vessel is cylindrical with hemispherical heads and is clad with stainless steel.

The pressurizer is a vertical cylindrical pressure vessel with hemispherical heads and is equipped with electrical heaters and spray nozzles for system pressure control.

The steam generators are vertical U-tube type heat exchangers with Inconel tubes. Reactor coolant flows inside the tubes; steam is generated in the shell and flows through the main steam lines to the turbine. When operating at 100 percent power, integral moisture separating equipment reduces moisture content of the steam at the exit of the steam generators to ≤0.05 percent. Under transient conditions at ≤100 percent power, the moisture content at the exit of the steam generators is <0.25 percent. The RCPs are vertical, single-stage, centrifugal units equipped with controlled leakage shaft seals.

Auxiliary systems are provided to charge the RCS and add makeup water, to purify reactor coolant water, to provide chemicals for corrosion inhibition and reactor control, to cool system components, to remove residual heat when the reactor is shut down, to cool the spent fuel storage pool, to sample reactor coolant water, to provide for emergency safety injection, and to vent and drain the RCS. Refer to Chapters 4 and 5 for additional discussion of the reactor and RCS, respectively.

1.2.2.3 Engineered Safety Features

The engineered safety features (ESFs) provided for the DCPP have sufficient capacity and redundancy to protect the health and safety of the public by keeping exposure below the limits set forth in 10 CFR Part 100 for any of the postulated malfunctions or accidents, including the most severe LOCA (refer to Chapter 15 for additional discussion).

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The ESFs provided in the DCPP are:

(1) A containment system that consists primarily of a steel-lined, reinforced concrete containment structure designed to prevent significant release to the environs of radioactive materials that could result from accidents inside the containment (refer to Sections 6.2.1 and 6.2.4).

(2) An emergency core cooling system (ECCS) that provides water to cool the core in the event of an accidental loss of primary reactor coolant water. The ECCS also supplies dissolved boron into the cooling water to provide shutdown margin (refer to Section 6.3).

(3) A containment spray system (CSS) to help limit the peak temperature and pressure in the containment in the event of a LOCA or main steam line break (MSLB) (refer to Section 6.2.2). The CSS, in conjunction with the spray additive system (SAS), also helps to limit the offsite radiation levels following the postulated LOCA by removing airborne iodine from the containment atmosphere during the injection phase (refer to Section 6.2.2 and 6.2.3).

(4) A containment fan cooler system (CFCS) that functions in conjunction with the CSS to limit the temperature and pressure in the containment structure in the event of a LOCA or MSLB (refer to Section 6.2.2). The CFCS also provides mixing of the sprayed and unsprayed regions of the containment atmosphere to improve airborne fission product removal (refer to Section 6.2.3). The CFCS function of mixing the containment atmosphere for hydrogen control is discussed below.

(5) A SAS that functions by adding sodium hydroxide, an effective iodine scrubbing solution, to the CSS water, to reduce the content of iodine and other fission products in the containment atmosphere and prevent the re-evolution of the iodine in the recirculated core cooling solution following a LOCA (refer to Section 6.2.3).

(6) The long term buildup of gaseous hydrogen in the containment following a LOCA is primarily controlled by ensuring a mixed containment atmosphere and providing equipment for monitoring hydrogen concentrations. The

CFCS is the primary means credited for containment atmosphere mixing (refer to Section 6.2.5).

(7) A fuel handling building ventilation system provides a significant reduction in the amounts of volatile radioactive materials that could be released to the atmosphere in the event of a major fuel handling accident (refer to Section 9.4.4).

(8) An auxiliary building ventilation system (ABVS) that provides the capability for significant reduction in the amounts of volatile radioactive materials that could be released to the atmosphere in the event of leakage from the residual heat removal system recirculation loop following a LOCA (refer to Section 9.4.2).

(9) A control room ventilation system (CRVS) permits continuous occupancy of the control room and technical support center (TSC) under design basis accidents by providing the capability to control infiltration of volatile radioactive material (refer to Sections 6.4.1 and 9.4.1).

(10) An auxiliary feedwater (AFW) system supplies water to the secondary side of the steam generators for reactor decay heat removal, when the main feedwater system is unavailable (refer to Section 6.5).

1.2.2.4 Instrumentation and Control

The primary purpose of the instrumentation and control system is to provide automatic protection against unsafe and improper reactor operation during steady state and transient power operation (ANS Conditions I, II, and III) and to provide initiating signals to mitigate the consequences of faulted conditions (ANS Condition IV). These plant conditions are discussed in Chapter 15, Accident Analysis.

The operation of the plant is monitored and controlled by operators in the control room, which is located in the auxiliary building.

Refer to Chapter 7 for additional discussion of the various instrumentation systems.

1.2.2.5 Electrical Systems

The electrical systems generate and transmit power to PG&E's high-voltage system, distribute power to the auxiliary loads, and provide control, protection, instrumentation, and annunciator power supplies for the units. Power is generated at 25-kV. Auxiliary loads are served at 12-kV, 4.16-kV, 480-V, 120-Vac, 125-Vdc, and 250-Vdc.

Offsite ac power (the preferred power supply) for the units' auxiliaries is available from two 230-kV transmission circuits and three 500-kV transmission circuits.

Onsite ac auxiliary power is supplied by each unit's main generator (normal onsite power source) and is also available for Class 1E loads from six diesel engine-driven generators (standby power supply). Three diesel generators are dedicated to each unit.

Onsite dc power is provided by three Class 1E and two non-Class 1E 125-Vdc batteries in each unit. The two non-Class 1E batteries are connected in series to provide 250-Vdc power in each unit.

Refer to Chapter 8 for additional discussion of the various electric power systems.

1.2.2.6 Power Conversion System

The turbines are each tandem-compound, four-element, 1800 rpm units, having one high-pressure and three identical double flow low-pressure elements. Combination moisture separator-reheaters are employed between the high- and low-pressure elements to dry and superheat the steam. The auxiliaries include deaerating surface condensers, steam jet air ejectors, motor-driven condensate pumps, motor-driven condensate booster pumps, turbine-driven main feedwater pumps, six stages of feedwater heating, and a full flow condensate demineralizer system.

The steam and power conversion system is designed to receive the heat generated by the RCS during normal power operation, as well as following an emergency shutdown of the turbine-generator from full load. Heat rejection under the latter condition is accomplished by steam bypass to the condenser and pressure relief to the atmosphere.

Refer to Chapter 10 for additional discussion of the steam and power conversion system.

1.2.2.7 Fuel Handling and Storage

The reactor is refueled using equipment designed to handle spent fuel under water from the time it leaves the reactor vessel until it is placed in a cask either for transport to the Diablo Canyon Independent Spent Fuel Storage Installation or for shipment from the site. Underwater transfer of spent fuel provides an optically transparent radiation shield, as well as a reliable source of coolant for removal of decay heat. Spent fuel is stored onsite in the spent fuel pools, which are fitted with special spent fuel storage racks to ensure that criticality cannot be approached. The fuel handling system (FHS) also provides capability for receiving, handling, and storing new fuel assemblies. Refer to Section 9.1.4 for additional discussion.

1.2.2.8 Auxiliary Systems

Auxiliary systems are supporting systems included in the facility, some of which are required to perform certain functions during emergency or accident conditions such as supporting the ESFs. Included are the cooling water systems (refer to Section 9.2), the heating and ventilating systems (refer to Section 9.4), the fire protection system (refer to

Section 9.5.1), the process auxiliaries (refer to Sections 9.3.2, 9.3.3, and 9.3.7), the compressed air system (refer to Sections 9.3.1 and 9.3.6), the diesel generator fuel oil system (refer to Section 9.5.4), the communication systems (refer to Section 9.5.2), and the lighting systems (refer to Section 9.5.3).

1.2.2.9 Radioactive Wastes

The radioactive waste treatment systems provide all equipment necessary to collect, process, monitor, and discharge radioactive liquid, gaseous, and solid wastes that are produced during reactor operation. Refer to Sections 11.2, 11.3, and 11.5 for additional discussion. A major portion of the waste treatment equipment is common for Unit 1 and Unit 2. This equipment is located in the shared auxiliary building (refer to Section 1.2.2.10.5).

1.2.2.10 Shared Facilities and Equipment

Separate systems and equipment are provided for each unit, with few exceptions. A brief summary of shared facilities and equipment between both units follows. Interconnections between systems for Unit 1 and Unit 2 are shown in the system diagrams. The system diagrams are contained in the UFSAR chapters referenced in the following paragraphs.

1.2.2.10.1 Site Facilities

The two units share a common auxiliary building (refer to Section 3.8.2.3). The turbine building is common to both units (refer to Section 3.8.3). The machine shop, access control area, warehouse area, telecommunications systems (refer to Figure 9.5-1), and administrative offices are common.

The two units also share a common raw water storage reservoir (refer to Section 6.5.3.3), fire pumps (refer to Section 9.5.1), fire water storage tank (refer to Section 9.5.1), diesel fuel oil storage tanks and transfer pumps (refer to Section 9.5.4.3.3), auxiliary boiler (refer to Section 9.3.7.1.3.3), makeup water system (refer to Section 9.2.3.3.3), plant air system (refer to Sections 9.3.1.3.3 and 9.3.6.3.3), and lubricating oil storage system.

Refer to Section 9.1.4.3.2 for a discussion of sharing of the FHS. Refer to Section 9.3.3.3.2 for a discussion of sharing of the equipment and floor drainage system.

1.2.2.10.2 Electrical Systems

The 230-kV line from the 230-kV switchyard serves the standby startup transformers for both Unit 1 and Unit 2. These are normally arranged on the low voltage sides to serve a single unit; however, the 12-kV buses for Unit 1 and Unit 2 are connected by an open circuit breaker (refer to Sections 8.2.3.1 and 8.3.1.1.2.3.2, respectively).

The plant has six diesel generator sets for emergency power. Refer to Section 8.3.1.1.6.3.3 for a discussion of sharing of diesel generator support systems.

Refer to Section 8.3.1.1.4.3.3 for a discussion of sharing of the 480-V system. Refer to Section 8.3.1.1.5.3.3 for a discussion of sharing of the 120-Vac system. Refer to Section 8.3.2.3.3 for a discussion of sharing of the 125-Vdc system.

1.2.2.10.3 Control Room

The plant is provided with a central control room located in the auxiliary building which is common to Unit 1 and Unit 2. Physical separation of control panels prevents interaction of the Unit 1 and Unit 2 control systems. Refer to Section 6.4.1.3.3 for a discussion of the common CRVS and common control room pressurization system, and Section 9.4.1.3.3 for a discussion of the common control room heating, ventilation and air-conditioning (HVAC) system.

Refer to Section 5.1.8.3 for a discussion of sharing of the RCP vibration monitoring system.

1.2.2.10.4 Chemical and Volume Control System

Several components of the chemical and volume control system are shared, as detailed in Chapter 9 (refer to Section 9.3.4.3.3).

1.2.2.10.5 Radioactive Waste Treatment Systems

The major portion of the waste treatment equipment is shared by Unit 1 and Unit 2. This equipment is located in the shared auxiliary building and is described in Chapter 11 (refer to Sections 11.2.3.3, 11.3.3.3, and 11.5.3.2).

1.2.2.10.6 Emergency Facilities and Equipment

The emergency facilities and equipment, both onsite and offsite, are discussed in the Emergency Plan which applies to both Unit 1 and Unit 2. For a discussion of the TSC habitability and HVAC systems (refer to Sections 6.4.2.3.1, 9.4.1.3.3, and 9.4.11.3.1).

1.2.2.10.7 Other Systems

Refer to Sections 9.2.6.3.3 and 6.5.3.3 for a discussion of the sharing of the condensate storage tanks.

Refer to Section 9.2.2.3.3 for a discussion of the sharing of the component cooling water system.

Refer to Section 9.2.7.3.3 for a discussion of the sharing of the auxiliary saltwater system.

Refer to Section 9.2.1.3.1 for a discussion of the sharing of the service cooling water system.

Refer to Section 9.2.5.3.2 for a discussion of the sharing of the ultimate heat sink system.

Refer to Section 9.4.23.3 for a discussion of the sharing of the ABVS.

Refer to Section 6.5.3.3 for a discussion of the sharing of the AFW system.

Refer to Section 10.3.3.3 for a discussion of the sharing of the main steam system.

1.2.3 REFERENCES

1. Emergency Plan, Diablo Canyon Power Plant - Units 1 and 2, Pacific Gas and Electric Company.

1.2.4 REFERENCE DRAWINGS

Figures representing controlled engineering drawings are incorporated by reference and are identified in Table 1.6-1. The contents of the drawings are controlled by DCPP procedures.

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED

1.3 COMPARISON TABLES

1.3.1 COMPARISON WITH SIMILAR FACILITY DESIGNS

Table 1.3-1 presents a comparison of the principal similarities and differences of the design of the DCPP units with those of Unit 1 at Trojan Nuclear Power Plant and Unit 1 and Unit 2 at Zion Station. This comparison is historical in nature and is valid only through March 1984.

1.3.2 COMPARISON OF FINAL AND PRELIMINARY DESIGNS

Table 1.3-2 identifies the major design changes made since the submittal of the DCPP Unit 2 Preliminary Safety Analysis Report. The comparison was considered to be valid through July 1974.

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED

1.4 IDENTIFICATION OF AGENTS AND CONTRACTORS

PG&E is the architect engineer, constructor, operator, and owner of DCPP and, as such, assumes full responsibility and authority for the design, construction, startup, and operation of Diablo Canyon Unit 1 and Unit 2. This section identifies the principal consultants, the nuclear steam system supplier, the suppliers of other equipment affecting nuclear safety, and the principal contractors engaged in the construction of the units. PG&E has performed all work for the planning, design, estimating, procurement, construction, installation, inspection, testing, and associated services necessary to provide complete plans and specifications and related services necessary to furnish a complete, operable, and acceptable plant, except for those items and functions that were furnished by those mentioned below.

1.4.1 CONSULTANTS

The consultants whose contracts exceed one hundred thousand dollars are listed in Table 1.4-1. The list is historical in nature and is valid only through March 1986. They performed investigations and submitted reports and recommendations to PG&E on the subjects indicated in the table. Application of the material submitted is the responsibility of PG&E.

1.4.2 NUCLEAR STEAM SUPPLY SYSTEM SUPPLIER

The NSSS was designed and furnished by the Westinghouse Electric Corporation. Westinghouse performed the detailed engineering design for all Westinghouse-supplied components and systems of the NSSS and procured, expedited, inspected, and delivered to PG&E all such equipment and components. Westinghouse provided design criteria, outline and/or assembly drawings, systems flow diagrams, and other data, as required, for PG&E to install, erect, operate, and maintain Westinghouse-supplied equipment and components. For all Westinghouse-supplied nuclear auxiliary systems, Westinghouse performed systems engineering, prepared reference designs and systems descriptions, and provided overall operating and engineering instructions.

Westinghouse further provided pertinent design criteria and data on the NSSS to enable PG&E to design the balance of plant. Westinghouse provided functional test procedures and technical assistance during construction, installation, inspections, and testing of its equipment and systems. A description of Westinghouse-provided technical assistance is given in Chapter 14, Initial Tests and Operations.

Westinghouse also performed the post-accident transient analysis of the plant containment system. This analysis consisted of determining the mass and energy releases (including metal-water reaction) as a function of time for the design basis LOCA and MSLB. From the foregoing data, PG&E has determined the design pressure and temperature, containment volume cooling requirements, etc. In general, Westinghouse has performed such transient analyses on the plant as are required for *the Westinghouse-furnished NSSS and turbine-generator unit. Transient analyses involving non-Westinghouse-supplied systems and components are PG&E's responsibility.*

Westinghouse also supplied material that is informational in nature, some of which appears in response to questions asked of Westinghouse during review meetings. Other information and recommendations have been offered by Westinghouse from their background experience. This type of material is not contractually binding for either company, nor was it intended to be a commitment of final design or operation. This material includes:

(1) The conceptual design of the dry reactor containment system. The specific designs of the reactor containment structure and associated ESFs are developed by PG&E.

(2) The details of a recommended waste disposal system that consists of equipment to collect, process, and dispose of radioactive liquid, gaseous, and solid wastes produced as a result of reactor operation

(3) Five recommended ESFs that consist of: steel-lined concrete reactor containment vessel, the safety injection system, the containment fan coolers, the containment spray equipment, and the air recirculation filters. Emergency power systems to operate the ESF systems are also as recommended by Westinghouse.

(4) The details of the recommended fuel handling facilities including structures, equipment, transfer, and operation

(5) The details of the recommended sampling system and analytical facilities

(6) The details of the recommended radiation shielding

(7) The outline of a recommended health physics program and recommended supplies

(8) The general criteria and preliminary design data for certain balance of plant.

Westinghouse, as a supplier to PG&E, is required to conform to the PG&E Quality Assurance Program as described in Chapter 17, Quality Assurance.

1.4.3 OTHER EQUIPMENT SUPPLIERS

Suppliers of important equipment or materials furnished to PG&E are listed in Table 1.4-2. In each case, the equipment was fabricated, or the material supplied qualified, to written specifications and, if PG&E Design Class I, under the Quality

Assurance Program in effect at the time of purchase. This list of suppliers is historical in nature and is valid only through March 1986.

1.4.4 CONSTRUCTION AND INSTALLATION CONTRACTORS

The principal construction and installation contractors whose contracts exceed one hundred thousand dollars are listed in Table 1.4-3. The list of contractors is historical in nature and is valid only through March 1986. The contracts are agreements between PG&E as owner-constructor and the contractors as independent contractors, with specific provisions for inspection, testing, and quality assurance.

Each contract specification identifies any PG&E Design Class I equipment involved and requires the implementation of the supplier's Quality Assurance Program (refer to Chapter 17, Quality Assurance). In addition, PG&E maintains a staff of inspectors to assure the quality of non-Class I equipment installation.

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED

1.5 REQUIREMENTS FOR FURTHER TECHNICAL INFORMATION

The design of DCPP is based on proven concepts, systems, and equipment in order to minimize the potential for cost and schedule overruns and to enhance the reliability of operation. As a consequence, there have been few requirements for research and development programs to confirm the adequacy of the design. Those programs identified for DCPP have been satisfactorily completed, as well as any other programs that have been identified as valuable to define margins of conservatism or possible design improvements. Table 1.5-1 is a list of those programs that have been addressed in earlier revisions of the original FSAR. This table provides a listing of the technical reports that include a discussion of the programs and their results. The listing is historical in nature and is valid only through November 1975.

1.6 MATERIAL INCORPORATED BY REFERENCE

1.6.1 WESTINGHOUSE TECHNICAL REPORTS

	Title	Section Reference	Date Submitted To AEC/NRC
1.	C. J. Kubit, Safety-Related Research and Development for Westinghouse Pressurized Water Reactors, Program Summaries-Fall, 1971-Spring, 1972, WCAP-7856, April 1972.	1.5	5/9/72
2.	F. T. Eggleston, Safety-Related Research and Development for Westinghouse PWRs, Program Summaries. Winter 77 - Summer 78, WCAP-8768, Revision 2, October 1978.	1.5, 4.2	10/78
3.	R. M. Hunt, Safety-Related Research and Development for Westinghouse PWRs, Program Summaries. Fall 1970, WCAP-7614-L, November 1970.	1.5	11/70
4.	R. M. Hunt, Safety-Related Research and Development for Westinghouse PWRs, Program Summaries. Spring 1970, WCAP-7498-L, May 1970.	1.5	5/70
5.	M. D. Davis, Safety-Related Research and Development for Westinghouse PWRs, Program Summaries. Fall 1974, WCAP-8485, March 1975.	1.5	3/75
6.	C. J. Kubit, Safety-Related Research and Development for Westinghouse PWRs, Program Summaries. Spring 1974, WCAP-8385, July 1974.	1.5	7/74
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8.	J. M. Hellman, Fuel Densification Experimental Results and Model for Reactor Operation, WCAP-8218-P-A, March 1975 (Proprietary) and WCAP-8219-A, March 1975 (Non-Proprietary).	1.5	3/75
9.	L. Geninski, et al, Safety Analysis of the 17 x 17 Fuel Assembly for Combined Seismic and Loss-of-Coolant Accident, WCAP-8288, December 1973.	1.5	12/73
10.	E. E. DeMario and S. Nakazato, Hydraulic Flow Test of the 17 x 17 Fuel Assembly, WCAP-8279, February 1974.	1.5	2/74

Title	Section Reference	Date Submitted To AEC/NRC
11. F. W. Cooper, Jr., 17 x 17 Drive Line Components Test - Phase IB, II, III - Drop and Deflection, WCAP-8446, December 1974.	1.5	12/74
12. K. W. Hill, et al, Effect of 17 x 17 Fuel Assembly Geometry on DNB, WCAP-8296-P-A, February 1975 (Proprietary) and WCAP-8297-A, February 1975.	1.5	2/75
13. F.E. Motley, et al, The Effect of 17 x 17 Fuel Assembly Geometry on Interchannel Thermal Mixing, WCAP-8298-P-A (Proprietary) and WCAP-8299-A, January 1975.	1.5	1/75
14. A. J. Burnett and S. D. Kopelic, Westinghouse ECCS Evaluation Model October 1975 Version, WCAP-8622 (Proprietary) and WCAP-8623 (Non-Proprietary), November 1975.	1.5	11/75
15. Irradiation of 17 x 17 Demonstration Assemblies in Surry Units No.1 and 2, Cycle 2, WCAP-8262, July 1974.	1.5	7/74
16. G.J. Bohm, Indian Point Unit 2 Internals Mechanical Analysis for Blowdown Exitation, WCAP-7822, December 1971.	3.9	12/20/71
17. P. M. Wood, et al, Use of Burnable-Poison Rods in Westinghouse Pressurized Water Reactors, WCAP-7113, October 1967.	3.9	11/6/67
18. R. F. Barry, et al, Power Distribution Monitoring in the R. E. Ginna PWR, WCAP-7756, September 1971.	3.9	10/5/71
19. L. T. Gesinski, Fuel Assembly Safety Analysis for Combined Seismic and Loss-of-Coolant Accident, WCAP-7950, July 1972.	3.9	7/14/72
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24. A. F. McFarlane, Power Peaking Factors, WCAP-7912-P-A, January 1975 (Westinghouse Proprietary) and WCAP-7912-A, January 1975.	4.3, 4.4	3/8/72
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29. F. D. Carter, Inlet Orificing of Open PWR Cores, WCAP-9004, (Westinghouse Proprietary), January 1969, and WCAP-7836, January 1972.	4.4	3/19/69 1/17/72
30. J. A. Nay, Process Instrumentation for Westinghouse Nuclear Steam Supply System, WCAP-7671, April 1971.	5.2, 7.1, 7.2, 7.3	5/10/71
31. W. O. Shabbits, Dynamic Fracture Toughness Properties of Heavy Section-A-533 Grade B Class I Steel Plate, WCAP-7623, September 1972.	5.2	9/15/72
32. W. S. Hazelton, et al, Basis for Heatup and Cooldown Limit Curves, WCAP-7924, July 1972.	5.2	8/14/72
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36. D. N. Katz, Solid State Logic Protection System Description, WCAP-7672, June 1971.	7.1, 7.2, 7.3	5/27/71
37. J. T. Haller, Engineered Safeguard Final Device or Activator Testing, WCAP-7705, February 1973.	7.1	2/27/73
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41. T. W. T. Burnett, Reactor Protection System Diversity in Westinghouse Pressurized Water Reactors, WCAP-7306, April 1969.	7.2, 15.4	4/9/69
42. A. E. Blanchard, Rod Position Monitoring, WCAP-7571, March 1971.	7.7	4/5/71
43. J. J. Loving, In-Core Instrumentation (Flux Mapping System and Thermocouples), WCAP-7607, July 1971.	7.7	7/27/71
44. H.G. Hargrove, FACTRAN, A Fortran IV Code for Thermal Transients in a UO_2 Fuel Rod, WCAP-7908-A, December 1989.	15.1,15.2, 15.3,15.4	11/29/83
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48.	R. F. Barry, LEOPARD - A Spectrum Dependent Non-Spatial Depletion Code for the IBM-7094, WCAP-3269-26, September 1963.	4.3	9/63
49.	S. Altomare and R. F. Barry, The TURTLE 24.0 Diffusion Depletion Code, WCAP-7213-P-A, February 1975 (Westinghouse Proprietary) and WCAP-7758-A, February 1975.	4.3	6/68, 9/71
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54.	F. W. Cooper, Jr., 17x17 Drive Line Components Tests Phase IB-II-III D-Loop Drop and Deflection, WCAP-8446 (Proprietary) and WCAP-8449 (Non-proprietary), (December 1974).	15.1	12/74
55.	J. V. Miller (Ed.), Improved Analytical Methods Used in Westinghouse Fuel Rod Design Calculations, WCAP-8720, October 1976.	4.2	10/76
56.	F. E. Motley and F. F. Cadek, DNB Test Results for New Mixing Vane Grids (R), WCAP-7695-P-A (Proprietary) and WCAP-7958-A (Non-Proprietary), January 1975.	4.4	1/75
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60.	T. Q. Nguyen, et al, Qualification of the PHOENIX-P/ANC Nuclear Design System for Pressurized Water Reactor Cores, WCAP-11596-P-A (Proprietary),June 1988.	4.3, 15.1	11/87
61.	Y. S. Liu, et al, ANC: A Westinghouse Advanced Nodal Computer Code, WCAP-10965-P-A (Proprietary), September 1986 and WCAP-10966-A (Non-Proprietary), September 1986.	4.3, 15.1, 15.3	5/86
62.	S. M. Bajorek, et al, Code Qualification Document for Best Estimate LOCA Analysis, WCAP-12945-P-A, Volume I: Models and Correlations, Revision 2, March 1998. Volume II: Heat Transfer Model Validation, Revision 1, March 1998. Volume III: Hydrodynamics, Components, and Integral Validation, Revision 1, March 1998. Volume IV: Assessment of Uncertainty, Revision 1, March 1998. Volume V: Quantification of Uncertainty, Revision 1, March 1998.	15.1, 15.4	5/97
63.	N. Lee, et al, Westinghouse Small Break ECCS Evaluation Model Using the NOTRUMP Code, WCAP-10054-P-A (Proprietary) and WCAP-10081-A (Non-Proprietary), August 1985 and, Addendum to the Westinghouse Small Break ECCS Evaluation Model Using the NOTRUMP Code: Safety Injection Into the Broken Loop and COSI Condensation Model, WCAP-10054-P-A, Addendum 2, Revision 1, July 1997 (Westinghouse Proprietary).	15.1, 15.3	11/88

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65. J. C. Schmertz, et al, Technical Justification for Eliminating Large Primary Loop Rupture as the Structural Design Basis for the Diablo Canyon Units 1 and 2 Nuclear Power Plants, WCAP-13039 (Proprietary) and WCAP-13038 (Non-proprietary), November 1991.	3.6	3/92

1.6.2 MISCELLANEOUS TECHNICAL REPORTS

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2.	C. R. Dickson, et al, "Aerodynamic Effects of the EBR-II Containment Vessel Complex on Effluent Concentration," Proc. of the AEC Meteor. Inf. Meeting at Chalk River, Ontario, September 11-14, 1967, pp. 87-104.	2.3$^{(1)}$
3.	J. G. Edinger, "The Influence of Terrain and Thermal Stratification of Flow Across the California Coastline," AFCRL-TR-60-438, Final Report, Contract No. AF(604)-5212, University of California, Los Angeles, 1960	2.3$^{(1)}$
4.	P. A. Leighton, "Geographic Aspects of Air Pollution," Geographic Review, LVI, No. 2, 1966, pp. 153-174.	2.3$^{(1)}$
5.	J. C. Ulberg, "Meteorological Data for Predicting Inhalation Hazards from Space Unit Launch Operations at Point Arguello," USNRDL-TR-1112, U.S. Naval Radiological Defense Laboratory, San Francisco, Ca., 1966, pp. 83.	2.3$^{(1)}$
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11.	J. Weisman, et al, "Experimental Determination of the Departure from Nucleate Boiling in Large Rod Bundles at High Pressure," Chem, Eng., Prog. Sump. Ser., 64, No. 82, 1968, pp. 114-125.	4.4
12.	L. S. Tong, et al, "Critical Heat Flux (DNB) in Square and Triangular Array Rod Bundles," JSME, Semi-International Symposium, Paper No. 256, Tokyo, Japan 1967	4.4
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17.	W. F. Pasedag and J. L. Gallagher, "Drop Size Distribution and Spray Effectiveness," Nuclear Technology, 10, 1971, p. 412.	6.2
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19.	W. D. Fletcher, et al, "Post-LOCA Hydrogen Generation in PWR Containments," Journal of American Nuclear Society, June 1970.	6.2
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42.	L. S. Tong, "Prediction of Departure from Nucleate Boiling for an Axially Non-Uniform Heat Flux Distribution," J. Nuclear Energy, 21, 1967, pp. 241-248.	4.4
43.	F. W. Dittus and L. M. K. Boelter, University of California (Berkeley), Public Eng., 1930, 2,433.	4.4, 15.4
44.	W. H. Jens and P. A. Lottes, Analysis of Heat Transfer, Burnout, Pressure Drop, and Density Data for High Pressure Water, USAEC Report ANL-4627, 1951.	15.4
45.	T. G. Taxelius, ed. Annual Report - Spert Project, October 1968 September 1969. Idaho Nuclear Corporation, IN-1370, June 1970.	15.4
46.	R. C. Liimatainen and F. J. Testa, Studies in TREAT of Zircaloy-2-Clad, UO_2 Core Simulated Fuel Elements, ANL-7225, January-June 1966, November, 1966, p. 177.	15.4

	Title	Section Reference
47.	Regulatory Guide 1.109, Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I, Revision 1, October 1977.	11.2, 11.3, 11.6

Note 1. These technical reports were originally referenced in FSAR Amendment 85, Appendices 2.3A and 2.3B (refer to Section 2.3.3.1).

1.6.3 DRAWINGS INCORPORATED BY REFERENCE

Controlled engineering drawings were removed from the UFSAR at Revision 15. The drawings are considered incorporated by reference. Table 1.6-1 identifies the controlled engineering drawings that are incorporated by reference and also provides a cross-reference of the controlled engineering drawings to the respective UFSAR figure number. The contents of the drawings are controlled by DCPP procedures.

TABLE 1.3-1

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED.

DESIGN COMPARISON OF DIABLO CANYON POWER PLANT UNITS 1 & 2, ZION STATION, AND TROJAN NUCLEAR PLANT

(Historical-valid through March 1984)

Chapter Number	*System/Component*	*Section Reference*	*Discussion*
1	*Introduction*	*1.1*	*All are 4-loop plants* *Reactor power ratings (Core thermal output):* *Diablo Canyon Unit 1: 3338 MWt* *Diablo Canyon Unit 2 & Trojan: 3411 MWt* *Zion: 3250 MWt*
3	*Containment*	*3.8.2*	*All containments are steel-lined concrete structures. Diablo Canyon uses conventional reinforcing; Trojan and Zion are posttensioned. Comparative dimensions and designed pressures are:* *I.D., ft / Net Vol, cu ft / Design Press, psig* *Diablo Canyon 140 2,630,000 47* *Trojan 124 2,000,000 60* *Zion 140 2,860,000 47*
4	*Reactor*	*4.2.1*	*Generally similar to Zion and Trojan, but differences exist in design based on nuclear and thermal-hydraulic design parameters.*
	Reactor Vessel	*4.2.2*	*Diablo Canyon Unit 1: Design of thermal shields and upper and lower Internals support structures, etc., is similar to Zion.* *Diablo Canyon Unit 2: Design of neutron pads and upper and lower support structures, etc., is similar to Trojan.*
	Reactivity Control	*4.2.3*	*Similar to Zion and Trojan.*

TABLE 1.3-1
HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED.

Chapter Number	System/Component	Section Reference	Discussion
4 (Cont'd)	*Nuclear Design*	*4.3*	*Similar to Zion and Trojan except differences exist in fuel burnup rates, fuel enrichments,* k_{eff}*, and core kinetics characteristics.*
	Thermal-hydraulic Design	*4.4*	*Similar to Zion and Trojan except for rating differences.*
5	*Reactor Coolant System*	*5.1, 5.2, 5.3, 5.4, 5.5*	*All three plants are similar in design except Diablo Canyon will use codes that specifically apply. Zion has loop stop valves.*
	Reactor Vessel	*5.4*	*Diablo Canyon Units 1 and 2 each have 50-year design life while Trojan and Zion are designed for 40 years.*
			Diablo Canyon Unit 2, Trojan, and Zion have four of the inner CRDM housings moved into the outer rows as compared to Diablo Canyon Unit 1. All have the same number of CRDM housings.
			Diablo Canyon Unit 1 uses ASME Code, Section III, 1965 Edition and addenda through winter 1966. Zion uses ASME Code, Section III, 1965 Edition and addenda through summer 1966. Diablo Canyon Unit 2 and Trojan use ASME Code, Section III, 1968 Edition.
			Diablo Canyon Unit 1 and Zion have blowout collars on bottom tubes only. Diablo Canyon Unit 2 does not have blowout collars. Trojan has blowout collars on control rod drive mechanisms and bottom tubes.
	Reactor Coolant Pumps	*5.5.1*	*Diablo Canyon Units 1 and 2 and Trojan have spacer couplings. Zion does not.*

TABLE 1.3-1

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED.

Chapter Number	*System/Component*	*Section Reference*	*Discussion*
5 (Cont'd)	*Steam Generators*	*5.5.2*	*Diablo Canyon and Zion have 1,100 psia secondary side design pressure. Trojan uses 1,200 psia.*
	Reactor Coolant Piping	*5.5.3*	*Diablo Canyon Units 1 and 2 and Zion use seamless forged pipe sections and 90° elbows which are cast sections joined by electroslag welds. Trojan uses centrifugally cast pipe sections. Zion's design is modified to accommodate the loop stop valves. Diablo Canyon and Zion are designed to B31.1. Trojan is designed to B31.7.*
	Residual Heat Removal System	*5.5.6*	*All are similar in design.*
	Pressurizer	*5.5.10*	*Head material is cast for Diablo Canyon Unit 1 and Zion while it is fabricated plate for Diablo Canyon Unit 2 and Trojan. The shell material is fabricated plate for all four units.*
6	*Containment Spray System*	*6.2.3*	*All are similar in design.*
	Emergency Core Cooling System	*6.3*	*All are similar in design.*
7	*Reactor Trip System*	*7.2*	*Diablo Canyon Units 1 and 2 and Trojan have solid-state logic protection systems while Zion has relay protection. The logic on trips associated with the reactor coolant pump power supplies is similar at Diablo Canyon Units 1 and 2 and Trojan. Zion is different because it has four separate buses, one for each pump, while Diablo Canyon and Trojan have two reactor coolant pumps per bus.*
	Engineered Safety Features Actuation System	*7.3*	*All four units have extended engineered safety features testability. Diablo Canyon Units 1 and 2 and Trojan have 2/3 high*

TABLE 1.3-1

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED.

Chapter Number	System/Component	Section Reference	Discussion
			containment pressure logic for safety injection initiation, while Zion uses 2/4 high containment pressure.
7 (Cont'd)	*Systems Required for Safe Shutdown*	*7.4*	*System functions are similar on all four units.*
	Safety-related Display Instrumentation	*7.5*	*Parametric display is similar for all four units. The physical configuration may differ.*
	Other Safety Systems	*7.6*	*All four units have residual heat removal isolation valve interlocking and automatic closure devices.*
	Control Systems	*7.7*	*Diablo Canyon Units 1 and 2 and Trojan have digital rod position indication systems, while Zion has analog rod position indication.*
8	*Electric Power*	*Fig. 8.1-1*	*Diablo Canyon and Trojan auxiliary systems supply loads at 12 and 4.16 kV. Zion does not have 12-kV loads.*
	Standby Power	*8.3.2*	*Trojan has two 4.16-kV ESF buses with one standby diesel generator unit (two engines in line per unit) on each bus. Diablo Canyon and Zion have five standby diesel generators, two for each unit and one that can be transferred to either unit.*
9	*Chemical and Volume*	*9.3.4*	*Similar, except Diablo Units 1 and 2 and Zion have 12 percent boric acid concentration systems, while Trojan has a 4 percent system.*
10	*Steam and Power Conversion System*	*10.2*	*Turbines are similar with three double-flow low pressure elements and six stages of feedwater heating.*
11	*Radioactive Waste Management*	*Entire chapter*	*Systems and treatment provided are similar.*

TABLE 1.3-2 Sheet 1 of 4

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED

MAJOR DESIGN CHANGES SINCE THE PSAR
(Historical-valid through July 1974)

Item	*Changes in Design*	*Original FSAR Section References*
1.	*Reactor vessel internals changes (Unit 2) - Thermal shield replaced by neutron pads, and lower core support plate and upper internals support system redesigned.*	*4.2.2*
2.	*Tetra boron carbide control rod poison material changed to silver-indium-cadmium.*	*4.2.3*
3.	*Pellet density, fuel rod pressure, and burnable poison loading pattern have changed to reflect more detailed design calculations and latest operating experience.*	*4.3*
4.	*Reactor vessel top and bottom head penetration and control rod drive mechanisms have been redesigned and removable insulation has been provided on the closure head to enable inservice inspection.*	*4.3, 5.4, 5.4.2, 5.4.4*
5.	*Safety injection now provides cold leg injection with cold leg or hot leg recirculation.*	*6.3*
6.	*Rod withdrawal step from rod drop signal and automatic turbine load cutback initiated by rod drop have been replaced by the power range neutron flux rate trips.*	*7.2*
7.	*Relay logic for reactor protection and engineered safety features actuation system has been changed to solid-state logic.*	*7.2, 7.3*
8.	*On-line testing has been provided for engineered safety features actuation system.*	*7.3*
9.	*Analog rod position indication has been replaced by digital rod position indication.*	*7.7.1*
10.	*Deleted in Revision 15*	
11.	*Design criteria changes in the event of inleakage of contaminated water into component cooling water (CCW) system. This tends to minimize possible release of reactor coolant outside containment via the CCW system.*	*9.2.2*

TABLE 1.3-2 Sheet 2 of 4

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED

Item	*Changes in Design*	*Original FSAR Section References*
12.	*The compressed air system is revised to eliminate the emergency air system. This satisfies safety criteria while reducing potential leakage paths from containment.*	*9.3.1*
13.	*The stainless steel liner in the spent fuel pool and transfer canal is changed from Design Class I to Design Class II. The liners prevent minor leakage, and the pool and canal structures remain Design Class I and are relied upon to prevent major failure.*	*9.1.2*
14.	*The primary water storage tank is reclassified from Design Class I to Design Class II. This is no longer the primary source of makeup water to the CCW System. A backup source to a makeup supply to a Design Class I system itself need not be classified Design Class I.*	*9.2.4*
15.	*The detectors for the fire detection alarm system are relocated to give more specific identification of the location of the source. Instrument ac power is provided.*	*9.5.1*
16.	*In the containment structure, vertical joints are provided with a shear key, as required by ACI 301-66.*	*3.8.2*
17.	*The Chief Mechanical Engineer is no longer the designated Project Engineer. This change was made April 26, 1971.*	*17.0*
18.	*Those parts of the fire protection system that protect Design Class II and III equipment and structures are not required to be Design Class I.*	*9.5.1*
19.	*Inspection procedures for cable were modified to require tests on sample reels from each production run, rather than on each reel.*	*8.5.2*
20.	*The fuel assembly array is revised from 15 x 15 to 17 x 17. The change was initiated to maintain sufficient flexibility to fulfill the requirements of, or any changes to, 10 CFR 50.46: "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors."*	*4 and 15*
21.	*The steam generator blowdown treatment system is added to provide for treatment in the event that there is primary-to-secondary leakage.*	*11.2.2*

TABLE 1.3-2 Sheet 3 of 4

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED

Item	*Changes in Design*	*Original FSAR Section References*
22.	*An alarm system is added to indicate the rupture of a auxiliary seawater cooling header. The function of the alarm is to alert the operator in the event that the header breaks, so that the operator can route the cooling water to the redundant supply header and restore the cooling function to the CCW system.*	*9.2*
23.	*The turbine building is protected from floods due to pipe breaks by the addition of an 18-inch overflow drain from the sump system to the circulating water discharge canal.*	*9.2*
24	*Protection against flooding of the turbine building is provided by design changes to decrease the probability of rupturing the expansion joints at the water box. Also, the consequences of a rupture are minimized by the addition of expansion joint sleeves.*	*10.4*
25.	*A system is added and designed to detect and alarm in the event that there are loose parts in the reactor coolant system.*	*3.9*
26.	*A Design Class I supply of demineralized water is provided for makeup to the spent fuel pool.*	*9.1*
27.	*The ventilation system for the fuel handling area is modified and reclassified to Design Class I.*	*9.4*
28.	*A Design Class I containment hydrogen purge system is provided for reducing the containment atmosphere hydrogen concentration in the event of a LOCA. The system has redundant sets of supply and exhaust fans and filters. Each fan is on a separate vital bus.*	*6.2*
29.	*The heating, ventilating, and air conditioning system for the control room is modified and is reclassified as Design Class I. The system has four modes of operation designed to make the control room habitable: (a) during normal operation,(b) during long-term occupancy, (c) in the event that there is excessive airborne activity external to the control room, and (d) in the event that there is a fire in the control room.*	*9.4*

TABLE 1.3-2 Sheet 4 of 4

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED

Item	*Changes in Design*	*Original FSAR Section References*
30.	*Design changes add the capability of maintaining reactor coolant system temperature during hot shutdown operations; when the reactor is subcritical, the steam dumps to the main condenser. This is accomplished by a controller in the steam line, operating in the pressure control mode, which is set to maintain the steam generator steam pressure.*	*5.1*
31.	*Meteorological monitoring equipment will provide data to be recorded in the control room during plant operation.*	*16.4*

TABLE 1.4-1

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED

PRINCIPAL CONSULTANTS AND CONTRACT DESCRIPTION
(Historical-valid through March 1986)

Principal Consultant	*Contract (Over $100,000)*
Anco Engineers, Inc.	*Raceway system qualification; seismic testing of mechanical equipment*
Arremany & Associates	*Nondestructive examination services*
Associated Technical Training Services	*Operator training*
Babcock & Wilcox, Inc.	*Engineering support*
Bechtel Power Corporation	*Project management, engineering, construction procurement, startup, project cost and scheduling, quality assurance*
J. R. Benjamin and Associates, Inc.	*Seismic verification of auxiliary and turbine buildings; frequency of vessel impact on intake structure*
William K. Brunot	*Reliability and risk analysis*
Burns & Roe, Inc.	*Engineering quality control services*
California Department of Fish and Game	*Marine biology studies*
California Polytechnic State University	*Marine biology studies*
Chemrad Corporation	*Radiological and health physics support*
Cygna Energy Services, Inc.	*Piping support and HVAC equipment qualification*
Earth Sciences Associates	*Geological investigations*
Ecological Analysts, Inc.	*Marine biology studies*

TABLE 1.4-1 Sheet 2 of 3

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED

Principal Consultant	*Contract (Over $100,000)*
EDS Nuclear, Inc.	*Control room (HVAC) design, technical support center pressurization system design, piping anchors design review, radiation shielding design review, emergency core cooling system nozzle fatigue analysis*
Energy Training Corporation	*Operator training*
Geri Engineering, Inc.	*Reactor vessel inservice inspection tool modification*
Harding - Lawson Associates	*Soil investigations, geophysical surveys*
Hydro - Research Science	*Discharge structure model study*
Innova Corporation	*Pipe support design review and redesign engineering*
James Engineering Company	*Engineering support*
Kaiser Engineers, Inc.	*Program management and engineering services, independent assessment of alternative cooling water systems*
Lambert & Company	*Nondestructive examination services*
Nuclear Services Corporation	*Pipe break analysis*
Nucon, Inc.	*Engineering support for fuel load and startup*
NUS Corporation	*Engineering studies of spent fuel pool storage expansion*
Nutech Engineers, Inc.	*Seismic and environmental qualification engineering support*
Offshore Technology Corporation	*Intake structure hydraulic model studies*
Omar J. Lillevang	*Breakwater design, breakwater damage study*

TABLE 1.4-1 Sheet 3 of 3

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED

Principal Consultant	*Contract (Over $100,000)*
Pickard, Lowe, & Garrick, Inc.	*Probabilistic risk assessment*
Project Assistance Corporation	*Quality assurance program support*
Radiation Research Associates, Inc.	*Shielding design review*
Regents of the University of California	*Thermal physical modeling studies*
R. F. Reedy and Associates	*Quality assurance verification*
Robert L. Cloud Associates, Inc.	*Hosgri seismic reverification program*
Stone & Webster Engineering Corporation	*Independent design verification program - Phase II*
TERA Corporation	*Source modeling studies, general engineering, thermal discharge assessment, assessment of alternative cooling water systems*
Terra Technology Corporation	*Seismic recording system maintenance and records processing*
Teledyne Engineering Services	*Independent design verification program*
URS/John A. Blume and Associates	*Seismic structural criteria, electrical seismic testing criteria, seismic research program, seismic review and reverification, independent internal review, Hosgri seismic evaluation*
Waltek Services	*Technical support services*
Westinghouse Electric Corporation	*Long-term seismic research program, environmental qualification, piping redesign and qualification, seismic reverification technical support*
Woodward - Clyde and Associates	*Seismic surveys*
Wyle Laboratories	*Seismic test and engineering support*

TABLE 1.4-2 Sheet 1 of 3

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED

SUPPLIERS OF IMPORTANT EQUIPMENT AND MATERIALS
OTHER THAN NUCLEAR STEAM SUPPLY SYSTEM
(Historical-valid through March 1986)

Supplier	*Equipment/Materials*
Alco Engines Division, White Industrial Power, Inc.	*Diesel generator units*
American Bridge Co., Division of U.S. Steel Corp.	*Furnish structural steel*
AMF Cuno Division	*Radioactive waste filters*
Armco Steel Corp.	*Containment wall penetration flued heads*
Babcock & Wilcox	*Safety parameter display system*
Berkeley Steel Construction Co.	*Radioactive waste tanks*
Bingham-Willamette Pump Co.	*Component cooling water pumps, auxiliary saltwater pumps*
Byron Jackson Pump, Division of Borg-Warner Corp.	*Auxiliary feedwater pumps*
Capital Westward Inc.	*Radioactive waste tanks*
Chem-Nuclear Services Inc.	*Radioactive resin removal and transfer system*
Chemetron Corp.	*Carbon dioxide*
Combustion Engineering	*Subcooled margin monitor*
Contromatics Corp.	*Radioactive waste valves*
De Laval Turbine Inc.	*Diesel fuel transfer pumps*
Dresser Industries Inc.	*Steam generator safety valves*
Fairbanks-Morse Co.	*Fire pumps*

TABLE 1.4-2 Sheet 2 of 3

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED

Supplier	*Equipment/Materials*
Fenwall Inc.	*Halon 1301 system*
Fisher Controls Co.	*Class I pressure/level controllers, and control valves*
Fulton Shipyard	*Fuel handling area crane*
General Electric Co.	*Electrical penetrations of containment structure, 12 and 4.16-kV switchgear*
Grinnell Co.	*Radioactive waste valves*
Harnischfeger P&H	*Turbine building bridge cranes*
Ingersoll-Rand Co.	*Radioactive waste pumps, reactor coolant drain tank pump, makeup water system pumps*
J. E. Lonergan Co.	*Class I safety relief valves*
Mine Safety Appliances Co.	*Radwaste gas analyzers*
Murphy Pacific Corp.	*Furnish structural steel*
M. W. Kellogg Co. (Pullman Power Products)	*Main systems piping*
National Controls, Inc.	*Condensed waste drumming system*
Paul Monroe Hydraulics	*Dome service crane snubbers*
Pyrotronics, Inc.	*Fire detection and alarm system*
Quick Manufacturing Co.	*Dome service crane*
Schutte and Koerting Co.	*Main steam isolation and check valves*
Scott Company of California	*Ventilation and air filters, fire water and stand pipe system*

TABLE 1.4-2 Sheet 3 of 3

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED

Supplier	*Equipment/Materials*
Velan Valve Corp.	*Radioactive waste valves*
Viking Automatic Sprinkler Co., Chemtron Corp. (Subcontractor)	*Water spray and* CO_2 *fire protection systems*
Westinghouse Electric Corp.	*Radioactive waste evaporators*
Yuba Manufacturing Co.	*Component cooling water heat exchanger, polar crane*

TABLE 1.4-3 Sheet 1 of 3

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED

CONSTRUCTION AND INSTALLATION CONTRACTORS

(Historical-valid through March 1986)

Contractor	*Units 1 and 2 In-progress Contracts Over $100,000*
Bechtel Construction Inc.	*Plant maintenance*
Plant Asbestos - Thorpe Insulation	*Furnish and install insulation*
Promatec	*Furnish and install insulation*
Pullman Power Products	*Erect plant and steam piping*
Westinghouse Electric Corporation	*Erect turbine-generator*
Contractor	*Units 1 and 2 Completed Contracts Over $100,000*
A. J. Diani Construction	*Paving of access roads*
American Bridge	*Complete structural steel*
Ames Associates	*Repair breakwater*
Arrowhead Industrial Water	*Furnish demineralizer*
Bigge Crane & Rigging Co.	*Heavy equipment handling*
Bigge Drayage Co.	*Material receiving/storage (Pismo Beach laydown and storage yard)*
Bostrom-Bergen	*Structural steel*
Bovee & Crail Construction	*Erect intake equipment & pipe*
Chemtrol Corporation	*Furnish and install penetration seals*
Continental Heller Corp.	*Construct security building*
E.H. Haskell Company	*Parking lot*

TABLE 1.4-3

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED

Contractor	*Units 1 and 2 Completed Contracts Over $100,000*
Endurance Metal Product Co.	*Erect miscellaneous steel*
Granite Constr. Co. and Gordon H. Ball, Inc.	*Construct breakwaters*
Guy F. Atkinson Company	*Construction of seismic modifications, construct buildings*
Healy - Tibbits	*Repair breakwater*
H&H Construction, Inc.	*Grading and paving (Pismo Beach laydown and storage yard)*
H. H. Robertson Co.	*Install siding and roofing*
H.P. Foley Company	*Install wiring, electrical equipment, and instrumentation. Construct seismic modifications of buildings.*
Morgan Equipment Co.	*Batch plant*
Murphy Pacific Corp.	*Furnish and install structural steel erect turbine building cranes*
Pinkerton's Inc.	*Security guard service*
Pittsburg-Des Moines Steel Co.	*Fabricate auxiliary building tanks, construct storage tanks*
Pullman Power Products	*Construct pipe rupture restraints*
Relocate Structures, Inc.	*Construct administration building*
Robert McMullan & Son, Inc.	*Finish painting*
Sanchez & Son, Inc.	*Grading and paving (Pismo Beach laydown and storage yard)*
San Luis Garbage	*Disposal of waste water*

TABLE 1.4-3 Sheet 3 of 3

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED

Contractor	*Units 1 and 2 Completed Contracts Over $100,000*
Scott Company of California	*Furnish and install air conditioning and ventilation*
System Steel Builders	*Construction offices, warehouse buildings (Pismo Beach laydown and storage yard)*
Tech-Sil, Inc.	*Furnish and install penetration seals*
Valley Trucking of Santa Maria, Inc.	*Disposal of waste water*
Viking Automatic Sprinkler Co.	*Furnish and install fire protection*
Walter Bros. Construction Co. and Milburn & Sansome Co.	*Plant roads and site preparation, construct Harford Drive-County Road construct access road*
Wismer & Becker Contracting Engineers	*Install electrical equipment switchyard, install mechanical equipment/erect NSSS*

TABLE 1.5-1

Sheet 1 of 3

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED

RESEARCH AND DEVELOPMENT PROGRAMS

(Historical-valid through November 1975)

PROGRAM	*TECHNICAL REPORTS*
Fuel development for operations at high power densities *Full-length emergency core cooling heat transfer tests (FLECHT)* *Reactor vessel thermal shock* *Verification test (17 x 17)* *Delayed departure from nucleate boiling (DDNB)*	*F. T. Eggleston, Safety-Related Research and Development for Westinghouse PWRs, Program Summaries. Winter 77 - Summer 78, WCAP-8768, Rev. 2, October 1978.*
Core stability evaluation *Blowdown forces program*	*C. J. Kubit, Safety-Related Research and Blowdown Development for Westinghouse PWRs, Program Summaries. Fall 1972, WCAP-8004, January 1973.*
Containment spray *Fuel rod burst* *Loss-of-coolant analysis* *ESADA DNB*	*R. M. Hunt, Safety-Related Research and Development for Westinghouse PWRs, Program Summaries. Fall 1970, WCAP-7614-L, November 1970.*
Burnable poison *Flashing heat transfer*	*R. M. Hunt, Safety-Related Research and Development for Westinghouse PWRs, Program Summaries. Spring 1970, WCAP-7498-L, May 1970.*
Fuel development for operation at high power densities	*M. D. Davis, Safety-Related Research and Development for Westinghouse PWRs, Program Summaries. Fall 1974, WCAP-8485, March 1975.*

TABLE 1.5-1

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED

PROGRAM	*TECHNICAL REPORTS*
Incore detector *Gross failed fuel detector*	*C. J. Kubit, Safety-Related Research and Development for Westinghouse PWRs, Program Summaries. Spring 1974, WCAP-8385, July 1974.*
Environmental testing of engineered safety features related equipment	*C. J. Kubit, Safety-Related Research and Development for Westinghouse PWRs, Program Summaries. Spring 1972, WCAP-7856, May 1972.*
In-pile fuel densification	*J. M. Hellman, Fuel Densification Experimental Results and Model for Reactor Operation, WCAP-8218-P-A March 1975 (Proprietary) and WCAP-8219-A, March, 1975 (Non-proprietary).*
Verification test (17 x 17)	*L. Geninski, et al, Safety Analysis of the 17 x 17 Fuel Assembly for Combined Seismic and Loss-of-Coolant Accident, WCAP-8288, December 1973.*
Verification test (17 x 17)	*E. E. DeMario and S. Makazato, Hydraulic Flow Test of the 17 x 17 Fuel Assembly, WCAP-8279, February 1974.*
Verification test (17 x 17)	*F. W. Cooper, Jr., 17 x 17 Drive Line Components Test - Phase IB, II, II, - Drop and Deflections, WCAP-8446, December 1974.*

TABLE 1.5-1

HISTORICAL INFORMATION IN ITALICS BELOW NOT REQUIRED TO BE REVISED

PROGRAM	*TECHNICAL REPORTS*
Departure from nucleate boiling (DNB)	*K. W. Hill, et al, Effect of 17 x 17 Fuel Assembler Geometry on DNB, WCAP-8396-P-A, February 1975 (Proprietary) and WCAP-8297-A, February 1975.*
Incore flow mixing	*F. E. Motley, et al, The Effect of 17 x 17 Fuel Assembly Geometry on Interchannel Thermal Mixing, (WCAP-8298-P-A) (Proprietary) and WCAP-8299-, January 1975.*
LOCA heat transfer tests	*A. J. Burnett and S. D. Kopelic, Westinghouse ECCS Evaluation Model October 1975 Version, WCAP-8622 (Proprietary) and WCAP-8623 (Non-Proprietary), November 1975.*
17 x 17 fuel surveillance program	*Irradiation of 17 x 17 Demonstration Assemblies in Surry Units No. 1 and 2, Cycle 2, WCAP-8262, July 1974.*

TABLE 1.6-1

CONTROLLED ENGINEERING DRAWINGS/FSAR UPDATE FIGURES CROSS REFERENCE

Figure	Sheet	Drawing	Description
1.2-3		500001-1	Area Location Plan
1.2-4		57727-1	Auxiliary, Containment, and Fuel Handling Buildings (Units 1 & 2), Plan at Elevation 140 ft
1.2-5		57726-1	Auxiliary, Containment, and Fuel Handling Buildings (Units 1 & 2), Plan at Elevation 115 ft
1.2-6		57725-1	Auxiliary, Containment, and Fuel Handling Buildings (Units 1 & 2), Plan at Elevations 91 and 100 ft
1.2-7		57724-1	Auxiliary and Containment Buildings (Units 1 & 2), Plan at Elevation 85 ft
1.2-8		57723-1	Auxiliary and Containment Buildings (Units 1 & 2), Plan at Elevation 73 ft
1.2-9		57722-1	Auxiliary and Containment Buildings (Unit 1 & 2), Plan at Elevations 60 and 64 ft
1.2-10		500977-1	Containment Building (Unit 2), Plan at Elevations 115 and 140 ft
1.2-11		500971-1	Containment & Fuel Handling Buildings (Unit 2), Plan at Elevations 85, 91, and 100 ft
1.2-12		500968-1	Containment Building (Unit 2), Plan at Elevations 60, 64, and 73 ft
1.2-13		57721-1	Turbine Building (Unit 1), Plan at Elevation 140 ft
1.2-14		57720-1	Turbine Building (Unit 1), Plan at Elevation 119 ft
1.2-15		57719-1	Turbine Building (Unit 1), Plan at Elevation 104 ft
1.2-16		57718-1	Turbine Building (Unit 1), Plan at Elevation 85 ft
1.2-17		500967-1	Turbine Building (Unit 2), Plan at Elevation 140 ft
1.2-18		500966-1	Turbine Building (Unit 2), Plan at Elevation 119 ft
1.2-19		500965-1	Turbine Building (Unit 2), Plan at Elevation 104 ft
1.2-20		500964-1	Turbine Building (Unit 2), Plan at Elevation 85 ft
1.2-21		57728-1	Auxiliary Building (Units 1 & 2), Section A-A
1.2-22		57729-1	Auxiliary and Containment Buildings (Unit 1 & 2), Section B-B
1.2-23		57730-1	Auxiliary and Fuel Handling Buildings (Unit 1 & 2), Section C-C

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Figure	Sheet	Drawing	Description
1.2-24		57731-1	Containment, Turbine, and Fuel Handling Buildings (Unit 1) Section D-D
1.2-25		57732-1	Auxiliary, Turbine, and Fuel Handling Buildings (Unit 1), Section E-E
1.2-26		57733-1	Auxiliary, Fuel Handling, and Turbine Buildings (Units 1 & 2), Section F-F
1.2-27		57734-1	Turbine Building (Unit 1), Section G-G
1.2-28		500969-1	Containment Building (Unit 2), Section A-A
1.2-29		500972-1	Vent & Fuel Handling Buildings (Unit 2), Section B-B
1.2-30		500973-1	Turbine, Containment, & Fuel Handling Buildings (Unit 2), Section C-C
1.2-31		500974-1	Turbine Building (Unit 2), Sections D-D and E-E
1.2-32		500976-1	Turbine Building (Unit 2), Section F-F
2.4-7		468999-1	Typical Sections for Tribar Armor Construction
2.4-8		469001-1	Restored Cross-sections and Embedment Plan
3.2-1	1 of 4	102001-3	Piping Schematic Legend
3.2-1	1A of 4	102023-2	Piping Schematic Legend
3.2-1	2 of 4	108001-3	Piping Schematic Legend
3.2-1	2A of 4	108023-2	Piping Schematic Legend
3.2-2	1 of 23	102002-4	Piping Schematic - Condensate System (23 Sheets)
3.2-2	2 of 23	108002-4	
3.2-2	3 of 23	102002-5	
3.2-2	3A of 23	102002-5A	
3.2-2	4 of 23	108002-5	
3.2-2	5 of 23	102002-6	
3.2-2	5A of 23	102002-6A	
3.2-2	6 of 23	108002-6	
3.2-2	7 of 23	102002-7	
3.2-2	8 of 23	108002-7	
3.2-2	9 of 23	102002-8	
3.2-2	9A of 23	102002-8A	
3.2-2	10 of 23	108002-8	
3.2-2	10A of 23	108002-8A	
3.2-2	11 of 23	102002-9	
3.2-2	11A of 23	102002-9A	

Figure	Sheet	Drawing	Description
3.2-2	11B of 23	102002-9B	
3.2-2	12 of 23	108002-9	
3.2-2	12A of 23	108002-9A	
3.2-2	13 of 23	102002-10	
3.2-2	14 of 23	108002-10	
3.2-2	15 of 23	102002-11	
3.2-2	16 of 23	108002-11	
3.2-3	1 of 11	102003-3	Piping Schematic - Feedwater System (11 Sheets)
3.2-3	1A of 11	102003-3A	
3.2-3	2 of 11	108003-3	
3.2-3	3 of 11	102003-4	
3.2-3	4 of 11	108003-4	
3.2-3	5 of 11	102003-4A	
3.2-3	6 of 11	108003-4A	
3.2-3	7 of 11	102003-5	
3.2-3	8 of 11	108003-5	
3.2-3	9 of 11	102003-6	
3.2-3	10 of 11	108003-6	
3.2-4	1 of 16	102004-3	Piping Schematic - Turbine Steam Supply System (16 Sheets)
3.2-4	2 of 16	108004-3	
3.2-4	3 of 16	102004-4	
3.2-4	4 of 16	108004-4	
3.2-4	5 of 16	102004-5	
3.2-4	6 of 16	108004-5	
3.2-4	7 of 16	102004-6	
3.2-4	8 of 16	108004-6	
3.2-4	9 of 16	102004-7	
3.2-4	10 of 16	108004-7	
3.2-4	11 of 16	102004-8	
3.2-4	12 of 16	108004-8	
3.2-4	13 of 16	102004-9	
3.2-4	14 of 16	102004-10	
3.2-4	15 of 16	108004-9	
3.2-4	16 of 16	108004-10	

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Figure	Sheet	Drawing	Description
3.2-5	1 of 12	102005-2	Piping Schematic - Extraction Steam and Heater Drip System (12 Sheets)
3.2-5	2 of 12	108005-2	
3.2-5	3 of 12	102005-3	
3.2-5	4 of 12	108005-3	
3.2-5	5 of 12	102005-4	
3.2-5	6 of 12	108005-4	
3.2-5	7 of 12	102005-5	
3.2-5	8 of 12	108005-5	
3.2-5	9 of 12	102005-6	
3.2-5	10 of 12	108005-6	
3.2-5	11 of 12	102005-7	
3.2-5	12 of 12	108005-7	
3.2-6	1 of 10	102006-3	Piping Schematic - Auxiliary Steam System (10 Sheets)
3.2-6	1A of 10	102006-3A	
3.2-6	2A of 10	102006-3B	
3.2-6	2 of 10	108006-3	
3.2-6	3 of 10	102006-4	
3.2-6	4 of 10	108006-4	
3.2-6	5 of 10	102006-4A	
3.2-6	6 of 10	108006-4A	
3.2-6	7 of 10	102006-5	
3.2-6	8 of 10	108006-5	
3.2-7	1 of 9	102007-3	Piping Schematic - Reactor Coolant System (9 Sheets)
3.2-7	2 of 9	108007-3	
3.2-7	3 of 9	102007-4	
3.2-7	4 of 9	108007-4	
3.2-7	5 of 9	102007-5	
3.2-7	6 of 9	108007-5	
3.2-7	7 of 9	102007-5A	
3.2-7	7A of 9	102007-5B	
3.2-7	8 of 9	108007-5A	
3.2-8	1 of 34	102008-3	Piping Schematic - Chemical and Volume Control System (34 Sheets)

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Figure	Sheet	Drawing	Description
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3.2-8	1B of 34	102008-3B	
3.2-8	1C of 34	102008-3C	
3.2-8	2 of 34	108008-3	
3.2-8	3 of 34	102008-4A	
3.2-8	4 of 34	108008-4A	
3.2-8	5 of 34	102008-4	
3.2-8	6 of 34	108008-4	
3.2-8	7 of 34	102008-4B	
3.2-8	7A of 34	102008-4C	
3.2-8	7B of 34	102008-4D	
3.2-8	7C of 34	102008-4E	
3.2-8	8 of 34	108008-4B	
3.2-8	8A of 34	108008-4C	
3.2-8	9 of 34	102008-5	
3.2-8	10 of 34	108008-5	
3.2-8	11 of 34	102008-5A	
3.2-8	12 of 34	108008-5A	
3.2-8	13 of 34	102008-5B	
3.2-8	14 of 34	108008-5B	
3.2-8	15 of 34	102008-5C	
3.2-8	16 of 34	108008-5C	
3.2-8	16A of 34	102008-5D	
3.2-8	17 of 34	102008-6	
3.2-8	17A of 34	102008-6A	
3.2-8	18 of 34	108008-6	
3.2-8	19 of 34	102008-7	
3.2-8	20 of 34	108008-7	
3.2-8	21 of 34	102008-8	
3.2-8	21A of 34	102008-8A	
3.2-8	22 of 34	108008-8	
3.2-8	23 of 34	102008-9	
3.2-8	24 of 34	108008-9	
3.2-9	1 of 12	102009-3	Piping Schematic - Safety Injection System (12 Sheets)
3.2-9	2 of 12	108009-3	

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Figure	Sheet	Drawing	Description
3.2-9	3 of 12	102009-4	
3.2-9	4 of 12	108009-4	
3.2-9	5 of 12	102009-5	
3.2-9	5A of 12	102009-5A	
3.2-9	6 of 12	108009-5	
3.2-9	6A of 12	108009-5A	
3.2-9	7 of 12	102009-6	
3.2-9	8 of 12	108009-6	
3.2-9	9 of 12	102009-7	
3.2-9	10 of 12	108009-7	
3.2-10	1 of 6	102010-3	Piping Schematic - Residual Heat Removal System (6 Sheets)
3.2-10	2 of 6	108010-3	
3.2-10	3 of 6	102010-4	
3.2-10	4 of 6	108010-4	
3.2-10	5 of 6	102010-5	
3.2-10	6 of 6	108010-5	
3.2-11	1 of 11	102011-2	Piping Schematic - Nuclear Steam Supply Sampling System (11 Sheets)
3.2-11	1A of 11	102011-2A	
3.2-11	2 of 11	108011-2	
3.2-11	3 of 11	102011-3	
3.2-11	4 of 11	108011-3	
3.2-11	5 of 11	102011-4	
3.2-11	6 of 11	108011-4	
3.2-11	7 of 11	102011-5	
3.2-11	8 of 11	108011-5	
3.2-11	9 of 11	102011-6	
3.2-11	10 of 11	108011-6	
3.2-12	1 of 2	102012-3	Piping Schematic - Containment Spray System (2 Sheets)
3.2-12	2 of 2	108012-3	
3.2-13	1 of 3	102013-2	Piping Schematic - Spent Fuel Pool Cooling System (3 Sheets)
3.2-13	1A of 3	102013-2A	
3.2-13	2 of 3	108013-2	

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Figure	Sheet	Drawing	Description
3.2-14	1 of 17	102014-5	Piping Schematic - Component Cooling Water System (17 Sheets)
3.2-14	2 of 17	108014-5	
3.2-14	3 of 17	102014-5A	
3.2-14	3A of 17	102014-5B	
3.2-14	4 of 17	108014-5A	
3.2-14	5 of 17	102014-6	
3.2-14	6 of 17	108014-6	
3.2-14	7 of 17	102014-6A	
3.2-14	8 of 17	108014-6A	
3.2-14	9 of 17	102014-7	
3.2-14	10 of 17	108014-7	
3.2-14	11 of 17	102014-8	
3.2-14	12 of 17	108014-8	
3.2-14	13 of 17	102014-9	
3.2-14	14 of 17	108014-9	
3.2-14	15 of 17	102014-10	
3.2-14	16 of 17	108014-10	
3.2-15	1 of 14	102015-3	Piping Schematic - Service Cooling Water System (14 Sheets)
3.2-15	1A of 14	102015-3A	
3.2-15	2 of 14	108015-3	
3.2-15	2A of 14	108015-3A	
3.2-15	2B of 14	108015-3B	
3.2-15	3 of 14	102015-4	
3.2-15	3A of 14	102015-4A	
3.2-15	4 of 14	108015-4	
3.2-15	5 of 14	102015-5	
3.2-15	6 of 14	108015-5	
3.2-15	7 of 14	102015-6	
3.2-15	8 of 14	108015-6	
3.2-15	9 of 14	102015-7	
3.2-15	10 of 14	108015-7	
3.2-16	1 of 21	102016-1	Piping Schematic - Makeup Water System (21 Sheets)
3.2-16	1A of 21	108016-1	

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Figure	Sheet	Drawing	Description
3.2-16	2 of 21	108016-3	
3.2-16	3 of 21	102016-4	
3.2-16	4 of 21	108016-5	
3.2-16	5 of 21	102016-6	
3.2-16	6 of 21	102016-7	
3.2-16	7 of 21	102016-8	
3.2-16	8 of 21	102016-9	
3.2-16	9 of 21	102016-9A	
3.2-16	10 of 21	102016-10	
3.2-16	11 of 21	102016-11	
3.2-16	12 of 21	102016-13	
3.2-16	13 of 21	102016-14	
3.2-16	14 of 21	102016-16	
3.2-16	15 of 21	108016-17	
3.2-16	16 of 21	102016-18	
3.2-16	17 of 21	108016-19	
3.2-16	18 of 21	102016-20	
3.2-16	19 of 21	102016-21	
3.2-16	19A of 21	102016-21A	
3.2-17	1 of 18	102017-3	Piping Schematic - Saltwater Systems (18 Sheets)
3.2-17	1A of 18	102017-3A	
3.2-17	1B of 18	102017-3B	
3.2-17	2 of 18	108017-3	
3.2-17	2A of 18	108017-3A	
3.2-17	2B of 18	108017-3B	
3.2-17	3 of 18	102017-4	
3.2-17	4 of 18	108017-4	
3.2-17	5 of 18	102017-5	
3.2-17	5A of 18	102017-5A	
3.2-17	6 of 18	108017-5	
3.2-17	7 of 18	102017-6	
3.2-17	7A of 18	102017-6A	
3.2-17	7B of 18	102017-6B	
3.2-17	8 of 18	108017-6	
3.2-17	8A of 18	108017-6A	

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Figure	Sheet	Drawing	Description
3.2-17	8B of 18	108017-6B	
3.2-17	8C of 18	108017-6C	
3.2-18	1 of 27	102018	Piping Schematic - Fire Protection Systems (27 Sheets)
3.2-18	1A of 27	102018-2A	
3.2-18	1B of 27	102018-2B	
3.2-18	2 of 27	108018-2	
3.2-18	3 of 27	102018-3	
3.2-18	4 of 27	108018-3	
3.2-18	4A of 27	108018-3A	
3.2-18	5 of 27	102018-4	
3.2-18	6 of 27	108018-4	
3.2-18	7 of 27	102018-4A	
3.2-18	8 of 27	108018-4A	
3.2-18	9 of 27	102018-5	
3.2-18	9A of 27	102018-5A	
3.2-18	10 of 27	108018-5	
3.2-18	10A of 27	108018-5A	
3.2-18	11 of 27	102018-6	
3.2-18	11A of 27	102018-6A	
3.2-18	12 of 27	108018-6	
3.2-18	12A of 27	108018-6A	
3.2-18	13 of 27	102018-7	
3.2-18	14 of 27	108018-7	
3.2-18	15 of 27	102018-8	
3.2-18	16 of 27	108018-8	
3.2-18	17 of 27	102018-9	
3.2-18	18 of 27	108018-9	
3.2-18	19 of 27	102018-19	
3.2-18	20 of 27	102018-20	
3.2-19	1 of 26	102019-3	Piping Schematic - Liquid Radwaste System (26 Sheets)
3.2-19	2 of 26	108019-3	
3.2-19	3 of 26	102019-3A	
3.2-19	3A of 26	102019-3B	
3.2-19	4 of 26	108019-3A	

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Figure	Sheet	Drawing	Description
3.2-19	4A of 26	108019-3B	
3.2-19	5 of 26	102019-4	
3.2-19	6 of 26	108019-4	
3.2-19	7 of 26	102019-5	
3.2-19	7A of 26	102019-5A	
3.2-19	7B of 26	102019-5B	
3.2-19	7C of 26	102019-5C	
3.2-19	8 of 26	108019-5	
3.2-19	8A of 26	108019-5A	
3.2-19	8B of 26	108019-5B	
3.2-19	9 of 26	102019-6	
3.2-19	10 of 26	108019-6	
3.2-19	11 of 26	102019-6A	
3.2-19	11A of 26	102019-6B	
3.2-19	12 of 26	108019-6A	
3.2-19	12A of 26	108019-6B	
3.2-19	13 of 26	102019-7	
3.2-19	14 of 26	108019-7	
3.2-19	15 of 26	102019-8	
3.2-19	15A of 26	102019-8A	
3.2-19	16 of 26	108019-8	
3.2-20	1 of 26	102020-3	Piping Schematic - Lube Oil Distribution and Purification System (26 Sheets)
3.2-20	1A of 26	102020-3A	
3.2-20	1B of 26	102020-3B	
3.2-20	2 of 26	108020-3	
3.2-20	2A of 26	108020-3A	
3.2-20	2B of 26	108020-3B	
3.2-20	3 of 26	102020-4	
3.2-20	4 of 26	108020-4	
3.2-20	5 of 26	102020-5	
3.2-20	6 of 26	108020-5	
3.2-20	7 of 26	102020-6	
3.2-20	7A of 26	102020-6A	
3.2-20	7B of 26	102020-6B	
3.2-20	8 of 26	108020-6	

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Figure	Sheet	Drawing	Description
3.2-20	8A of 26	108020-6A	
3.2-20	8B of 26	108020-6B	
3.2-20	9 of 26	102020-7	
3.2-20	10 of 26	108020-7	
3.2-20	11 of 26	102020-8	
3.2-20	12 of 26	108020-8	
3.2-20	13 of 26	102020-9	
3.2-20	14 of 26	108020-9	
3.2-20	15 of 26	102020-10	
3.2-20	16 of 26	108020-10	
3.2-20	17 of 26	102020-11	
3.2-20	18 of 26	108020-11	
3.2-21	1 of 35	102021-2	Piping Schematic - Diesel Engine-Generator Systems (35 Sheets)
3.2-21	2 of 35	108021-2	
3.2-21	3 of 35	102021-3	
3.2-21	3A of 35	102021-3A	
3.2-21	4 of 35	108021-3	
3.2-21	4A of 35	108021-3A	
3.2-21	4B of 35	108021-3B	
3.2-21	5 of 35	102021-4	
3.2-21	5A of 35	102021-4A	
3.2-21	6 of 35	108021-4	
3.2-21	6A of 35	108021-4A	
3.2-21	6B of 35	108021-4B	
3.2-21	7 of 35	102021-5	
3.2-21	8 of 35	108021-5	
3.2-21	8A of 35	108021-5A	
3.2-21	8B of 35	108021-5B	
3.2-21	9 of 35	102021-6	
3.2-21	9A of 35	102021-6A	
3.2-21	10 of 35	108021-6	
3.2-21	10A of 35	108021-6A	
3.2-21	10B of 35	108021-6B	
3.2-21	11 of 35	102021-7	
3.2-21	11A of 35	102021-7A	

Figure	Sheet	Drawing	Description
3.2-21	11B of 35	102021-7B	
3.2-21	12 of 35	108021-7	
3.2-21	12A of 35	108021-7A	
3.2-21	12B of 35	108021-7B	
3.2-21	13 of 35	102021-8	
3.2-21	14 of 35	108021-8	
3.2-21	14A of 35	108021-8A	
3.2-21	14B of 35	108021-8B	
3.2-21	15 of 35	102021-9	
3.2-21	16 of 35	108021-9	
3.2-21	16A of 35	108021-9A	
3.2-21	16B of 35	108021-9B	
3.2-22	1 of 16	102022-2	Piping Schematic - Turbine and Generator-Associated Systems (16 Sheets)
3.2-22	2 of 16	108022-2	
3.2-22	3 of 16	102022-3	
3.2-22	4 of 16	108022-3	
3.2-22	5 of 16	102022-4	
3.2-22	6 of 16	108022-4	
3.2-22	7 of 16	102022-5	
3.2-22	7A of 16	102022-5A	
3.2-22	8 of 16	108022-5	
3.2-22	8A of 16	108022-5A	
3.2-22	9 of 16	102022-6	
3.2-22	9A of 16	102022-6A	
3.2-22	10 of 16	108022-6	
3.2-22	10A of 16	108022-6A	
3.2-22	11 of 16	102022-7	
3.2-22	12 of 16	108022-7	
3.2-23	1 of 53	102023-3	Piping Schematic - Ventilation and Air Conditioning Systems (53 Sheets)
3.2-23	2 of 53	108023-3	
3.2-23	3 of 53	102023-4	
3.2-23	4 of 53	108023-4	
3.2-23	5 of 53	102023-5	
3.2-23	6 of 53	108023-5	

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Figure	Sheet	Drawing	Description
3.2-23	7 of 53	102023-6	
3.2-23	7A of 53	102023-6A	
3.2-23	7B of 53	102023-6B	
3.2-23	8 of 53	108023-6	
3.2-23	8A of 53	108023-6A	
3.2-23	9 of 53	102023-7	
3.2-23	10 of 53	108023-7	
3.2-23	11 of 53	102023-8	
3.2-23	12 of 53	108023-8	
3.2-23	13 of 53	102023-9	
3.2-23	13A of 53	102023-9A	
3.2-23	14 of 53	108023-9	
3.2-23	15 of 53	102023-10	
3.2-23	16 of 53	108023-10	
3.2-23	17 of 53	102023-11	
3.2-23	18 of 53	108023-11	
3.2-23	19 of 53	102023-12	
3.2-23	20 of 53	108023-12	
3.2-23	21 of 53	102023-13	
3.2-23	21A of 53	102023-13A	
3.2-23	22 of 53	108023-13	
3.2-23	23 of 53	102023-14	
3.2-23	24 of 53	108023-14	
3.2-23	24A of 53	108023-15	
3.2-23	25 of 53	102023-16	
3.2-23	25A of 53	108023-16	
3.2-23	26A of 53	102023-17A	
3.2-23	26B of 53	102023-17B	
3.2-23	26C of 53	102023-17C	
3.2-23	26 of 53	102023-17	
3.2-23	26D of 53	108023-17	
3.2-23	27 of 53	102023-15	
3.2-23	28 of 53	102023-19	
3.2-23	29 of 53	102023-18	
3.2-23	29A of 53	102023-18A	

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Figure	Sheet	Drawing	Description
3.2-23	29B of 53	102023-18B	
3.2-23	29C of 53	102023-18C	
3.2-23	29D of 53	102023-18D	
3.2-23	29E of 53	102023-18E	
3.2-23	29F of 53	102023-18F	
3.2-23	30 of 53	108023-18	
3.2-23	30A of 53	108023-18A	
3.2-23	30B of 53	108023-18B	
3.2-23	30C of 53	108023-18C	
3.2-23	30D of 53	108023-19	
3.2-23	31 of 53	102023-20	
3.2-23	32 of 53	108023-20	
3.2-24	1 of 2	102024-3	Piping Schematic - Gaseous Radwaste System (2 Sheets)
3.2-24	2 of 2	108024-3	
3.2-25	1 of 13	102025-3	Piping Schematic - Compressed Air System (13 Sheets)
3.2-25	1A of 13	102025-3A	
3.2-25	1B of 13	102025-3B	
3.2-25	2 of 13	108025-3	
3.2-25	3 of 13	102025-4	
3.2-25	3A of 13	102025-4A	
3.2-25	4 of 13	108025-4	
3.2-25	5 of 13	102025-5	
3.2-25	6 of 13	108025-5	
3.2-25	7 of 13	102025-6	
3.2-25	8 of 13	108025-6	
3.2-25	8A of 13	102025-8	
3.2-25	9 of 13	108025-8	
3.2-26	1 of 5	102026-3	Piping Schematic - Nitrogen and Hydrogen System (5 Sheets)
3.2-26	1A of 5	102026-3A	
3.2-26	2 of 5	108026-3	
3.2-26	3 of 5	102026-4	
3.2-26	4 of 5	108026-4	

Figure	Sheet	Drawing	Description
3.2-27	1 of 2	102027-3	Piping Schematic - Oily Water Separator and Turbine Building Sump System (2 Sheets)
3.2-27	2 of 2	108027-3	
3.5-6		505481-1	Auxiliary Feedwater Pump Turbine Missile Shield
3.6-2	1 of 2	438288-1	Containment Structure Pipe Rupture Restraints (2 sheets)
3.6-2	2 of 2	443359-1	
3.6-5		515939-1	HELB Compartment Pressurization Study El. 85 ft Turbine Building
3.6-6		515940-1	HELB Compartment Pressurization Study El. 104 ft Turbine Building
3.6-7		515941-1	HELB Compartment Pressurization Study El. 119 ft Turbine Building
3.6-8		515942-1	HELB Compartment Pressurization Study El. 140 ft Turbine Building
3.6-9		515943-1	HELB Compartment Pressurization Study El. 60 ft Auxiliary and Containment Building
3.6-10		515944-1	HELB Compartment Pressurization Study El. 73 ft Auxiliary and Containment Building
3.6-11		515945-1	HELB Compartment Pressurization Study El. 85 ft Auxiliary and Containment Building
3.6-12		515946-1	HELB Compartment Pressurization Study El. 91 and 100 ft Auxiliary, Containment and Fuel Handling Bldg
3.6-13		515947-1	HELB Compartment Pressurization Study El. 115 ft Auxiliary, Containment and Fuel Handling Bldg
3.6-14		515948-1	HELB Compartment Pressurization Study El. 140 ft Auxiliary, Containment and Fuel Handling Bldg
3.6-15		515949-1	HELB Compartment Pressurization Study Section A-A Auxiliary Bldg
3.8-16	1 of 2	443252-1	Interior Concrete Outline – Plan at El. 119 ft and 140 ft, Containment Structure Areas G and F (2 sheets)
3.8-16	2 of 2	438233-1	
3.8-17	1 of 2	443254-1	Interior Concrete Outline Main Sections Containment Structure (2 sheets)
3.8-17	2 of 2	438234-1	

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Figure	Sheet	Drawing	Description
3.8-18	1 of 2	443276-1	Interior Concrete Reinforcing Typical Details and Drawing List Containment Structure (2 sheets)
3.8-18	2 of 2	438231-1	
3.8-19	1 of 4	443277-1	Interior Concrete Reinforcing Sections and Details Containment Structure (4 sheets)
3.8-19	2 of 4	438239-1	
3.8-19	3 of 4	438240-1	
3.8-19	4 of 4	438242-1	
3.8-20	1 of 2	443370-1	Concrete Outline and Reinforcing Annulus Platform at El. 140 ft, Containment Structure Areas F and G (2 sheets)
3.8-20	2 of 2	447254-1	
3.8-23		438267-1	Containment Structure, Polar Crane
3.8-45		438431-1	Auxiliary Building, Concrete Outline - Plan at El. 100 ft Areas H and K
3.8-46	1 of 2	438432-1	Auxiliary Building, Concrete Outline - Plan at El. 115 ft Areas J, GE, and GW (2 sheets)
3.8-46	2 of 2	439533-1	
3.8-47	1 of 3	438449-1	Auxiliary Building, Concrete Outline - Plans at El. 85, 100, 115, and 140 ft - Area L (3 sheets)
3.8-47	2 of 3	443204-1	
3.8-47	3 of 3	443205-1	
3.8-48		438445-1	Auxiliary Building, Concrete Outline - Section Areas J and K
3.8-49		438441-1	Auxiliary Building, Concrete Outline - Section Areas H and K
3.8-50	1 of 2	438457-1	Auxiliary Building, Concrete Reinforcing - Plan at El. 115 ft - Areas J, GE, and GW (2 sheets)
3.8-50	2 of 2	443227-1	
3.8-51		438458-1	Auxiliary Building, Concrete Reinforcing - Plan at El. 115 ft - Areas H and K
3.8-52		443216-1	Auxiliary Building, Concrete Reinforcing - Plans at El. 115 and 140 ft - Area L
3.8-53		443460-1	Auxiliary Building, Concrete Reinforcing - Miscellaneous Sections - Area K
3.8-54		438471-1	Auxiliary Building, Concrete Reinforcing – Section Areas H, K, and GE
3.8-55		438465-1	Auxiliary Building, Control Room - Sections

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Figure	Sheet	Drawing	Description
3.8-56		438474-1	Auxiliary Building, Spent Fuel Pool - Concrete Reinforcing
3.8-57		439506-1	Auxiliary Building, Crane Support Structure - Elevations and Details
3.8-58		439507-1	Auxiliary Building, Crane Support Structure - Section and Details
3.8-59		439509-1	Auxiliary Building, Refueling Areas Overhead Crane
3.8-65	1 of 2	438034-1	Design Class I Tanks Concrete Foundations (2 Sheets)
3.8-65	2 of 2	463987-1	
3.8-72	1 of 2	59459-1	Concrete Outline Plan – Top Deck Area 1 Intake Structure
3.8-72	2 of 2	59460-1	Concrete Outline Plan – Top Deck Area 2 Intake Structure
3.8-73	1 of 2	59461-1	Concrete Outline Plan – Pump Deck Area 1 Intake Structure
3.8-73	2 of 2	59462-1	Concrete Outline Plan – Pump Deck Area 2 Intake Structure
3.8-74	1 of 2	59463-1	Concrete Outline Plan – Invert Area 1 Intake Structure
3.8-74	2 of 2	59464-1	Concrete Outline Plan – Invert Area 2 Intake Structure
3.8-83		515213-1	Safety Related Masonry Walls, Turbine Bldg - Unit 1
3.8-84		515214-1	Safety Related Masonry Walls, Turbine Bldg - Unit 2
3.8-85		515215-1	Safety Related Masonry Walls, Auxiliary Bldg
5.5-13		500825-1	U1: Function Diagram, Reactor-Turbine Generator Protection
5.5-17		500800-1	U2: Function Diagram, Reactor-Turbine Generator Protection
6.3-6		6023231-1	DCPP1 Strainer Installation
6.3-7		6023231-20	DCPP2 Strainer Installation
6.5-1		107031-4	Auxiliary Feedwater System
6.5-2		107031-1A	Long Term Cooling Water System
7.2-1	1 of 36	495841-1	Instrumentation and Control System Logic Diagrams (36 Sheets)
7.2-1	2 of 36	495871-1	
7.2-1	3 of 36	495842-1	

Figure	Sheet	Drawing	Description
7.2-1	4 of 36	495872-1	
7.2-1	5 of 36	495843-1	
7.2-1	6 of 36	495873-1	
7.2-1	7 of 36	495844-1	
7.2-1	8 of 36	495874-1	
7.2-1	9 of 36	495845-1	
7.2-1	10 of 36	495875-1	
7.2-1	11 of 36	495846-1	
7.2-1	12 of 36	495876-1	
7.2-1	13 of 36	495847-1	
7.2-1	14 of 36	495877-1	
7.2-1	15 of 36	495848-1	
7.2-1	16 of 36	495878-1	
7.2-1	17 of 36	495849-1	
7.2-1	18 of 36	495879-1	
7.2-1	19 of 36	495850-1	
7.2-1	20 of 36	495880-1	
7.2-1	21 of 36	495851-1	
7.2-1	22 of 36	495881-1	
7.2-1	23 of 36	495852-1	
7.2-1	24 of 36	495882-1	
7.2-1	25 of 36	495853-1	
7.2-1	26 of 36	495883-1	
7.2-1	27 of 36	495854-1	
7.2-1	28 of 36	495884-1	
7.2-1	29 of 36	495855-1	
7.2-1	30 of 36	495885-1	
7.2-1	31 of 36	495856-1	
7.2-1	32 of 36	495886-1	
7.2-1	33 of 36	495857-1	
7.2-1	34 of 36	495887-1	
7.2-1	35 of 36	495858-1	
7.2-1	36 of 36	495888-1	
7.3-1		19425-1	Logic Diagram Symbols

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Figure	Sheet	Drawing	Description
7.3-2	1 of 2	338070-1	Logic Diagram - Reactor Coolant Pump (2 sheets)
7.3-2	2 of 2	102787-1	
7.3-3	1 of 2	19404-1	Logic Diagram – Centrifugal Charging Pump (CCP3) (2 sheets)
7.3-3	2 of 2	102788-1	
7.3-4	1 of 2	19405-1	Logic Diagram - Centrifugal Charging Pumps (CCP1 and CCP2) (2 sheets)
7.3-4	2 of 2	102789-1	
7.3-5	1 of 2	19406-1	Logic Diagram - Auxiliary Saltwater Pumps (2 sheets)
7.3-5	2 of 2	102790-1	
7.3-6	1 of 2	19407-1	Logic Diagram - Containment Fan Coolers (2 sheets)
7.3-6	2 of 2	102791-1	
7.3-7	1 of 2	19408-1	Logic Diagram - Component Cooling Water Pumps (2 sheets)
7.3-7	2 of 2	102792-1	
7.3-8	1 of 2	19409-1	Logic Diagram - Auxiliary Feedwater Pumps (2 sheets)
7.3-8	2 of 2	102800-1	
7.3-9		19410-1	Logic Diagram - Residual Heat Removal Pumps (2 sheets)
7.3-9	2 of 2	102793-1	
7.3-10	1 of 2	19411-1	Logic Diagram - Safety Injection Pumps (2 sheets)
7.3-10	2 of 2	102794-1	
7.3-11	1 of 2	19412-1	Logic Diagram - Containment Spray Pumps (2 sheets)
7.3-11	2 of 2	102795-1	
7.3-12	1 of 2	19413-1	Logic Diagram - Primary Makeup Water Pumps (2 sheets)
7.3-12	2 of 2	102796-1	
7.3-13	1 of 2	19414-1	Logic Diagram - Boric Acid Transfer Pumps (2 sheets)
7.3-13	2 of 2	102797-1	

Figure	Sheet	Drawing	Description
7.3-14	1 of 2	437507-1	Schematic Diagram - Auxiliary Feedwater Motor-Operated Valves (2 sheets)
7.3-14	2 of 2	441301-1	
7.3-15	1 of 2	437551-1	Schematic Diagram - Turbine Control (2 sheets)
7.3-15	2 of 2	441253-1	
7.3-16	1 of 2	437567-1	Schematic Diagram - Feedwater Pump Turbine Control (2 sheets)
7.3-16	2 of 2	441270-1	
7.3-17	1 of 2	437583-1	Schematic Diagram - Motor-Driven Auxiliary Feedwater Pumps (2 sheets)
7.3-17	2 of 2	441302-1	
7.3-18	1 of 4	437584-1	Schematic Diagram - Auxiliary Feedwater Pumps Turbine Control (4 Sheets)
7.3-18	2 of 4	455060-1	
7.3-18	3 of 4	441303-1	
7.3-18	4 of 4	455097-1	
7.3-19	1 of 2	437585-1	Schematic Diagram - Feedwater Motor-Operated Isolation Valves (2 sheets)
7.3-19	2 of 2	441304-1	
7.3-20	1 of 2	477846-1	Schematic Diagram - Reactor Coolant Pump (2 sheets)
7.3-20	2 of 2	441305-1	
7.3-21	1 of 4	437587-1	Schematic Diagram - Reactor Coolant Motor-Operated Valves and Reactor Coolant System Solenoid Valves (4 Sheets)
7.3-21	2 of 4	437609-1	
7.3-21	3 of 4	441306-1	
7.3-21	4 of 4	441328-1	
7.3-22	1 of 2	437588-1	Schematic Diagram - Safety Injection System Solenoid Valves (2 sheets)
7.3-22	2 of 2	441316-1	
7.3-23	1 of 2	437589-1	Schematic Diagram - Safety Injection Pumps (2 sheets)
7.3-23	2 of 2	441315-1	
7.3-24	1 of 2	437590-1	Schematic Diagram - Containment Spray Pumps (2 sheets)
7.3-24	2 of 2	441307-1	

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Figure	Sheet	Drawing	Description
7.3-25	1 of 2	437591-1	Schematic Diagram - Residual Heat Removal Pumps (2 sheets)
7.3-25	2 of 2	441309-1	
7.3-26	1 of 2	437592-1	Schematic Diagram - Residual Heat Removal Flow Control Valves (2 sheets)
7.3-26	2 of 2	441310-1	
7.3-27	1 of 2	437593-1	Schematic Diagram - Component Cooling Water Pumps (2 sheets)
7.3-27	2 of 2	441311-1	
7.3-28	1 of 2	437594-1	Schematic Diagram - Auxiliary Saltwater Pumps (2 sheets)
7.3-28	2 of 2	441287-1	
7.3-29	1 of 2	437595-1	Schematic Diagram - Charging Pumps (2 sheets)
7.3-29	2 of 2	441312-1	
7.3-30	1 of 8	437596-1	Schematic Diagram - Chemical and Volume Control System (8 Sheets)
7.3-30	2 of 8	437597-1	
7.3-30	3 of 8	437598-1	
7.3-30	4 of 8	437599-1	
7.3-30	5 of 8	441320-1	
7.3-30	6 of 8	441321-1	
7.3-30	7 of 8	441322-1	
7.3-30	8 of 8	477316-1	
7.3-31	1 of 4	437600-1	Schematic Diagram - Containment Fan Coolers (4 sheets)
7.3-31	2 of 4	437600-2	
7.3-31	3 of 4	441313-1	
7.3-31	4 of 4	441313-2	
7.3-32	1 of 2	437604-1	Schematic Diagram - Containment Spray System Motor-Operated Valves (2 sheets)
7.3-32	2 of 2	441308-1	
7.3-33	1 of 5 (U1)	437605-1	Schematic Diagram - Safety Injection System Motor-Operated Valves (5 Sheets)
7.3-33	2 of 5 (U1)	437606-1	
7.3-33	3 of 5 (U2)	441317-1	
7.3-33	4 of 5 (U2)	441318-1	
7.3-33	5 of 5 (U2)	441318-2	

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Figure	Sheet	Drawing	Description
7.3-34	1 of 3 (U1)	437607-1	Schematic Diagram - Chemical and Volume Control System Motor-Operated Valves. (2 sheets)
7.3-34	2 of 3 (U2)	441324-1	
7.3-34	3 of 3 (U2)	441324-2	
7.3-35	1 of 2	437608-1	Schematic Diagram - Component Cooling Water System Motor-Operated Valves (2 sheets)
7.3-35	2 of 2	441325-1	
7.3-36	1 of 2	437610-1	Schematic Diagram - Reactor Trip Breakers (2 sheets)
7.3-36	2 of 2	441489-1	
7.3-37		437630-1	Schematic Diagram - Fire Pumps
7.3-38	1 of 2	437631-1	Schematic Diagram - Containment Purge System (2 sheets)
7.3-38	2 of 2	441490-1	
7.3-39		437632-1	Schematic Diagram - Plant Air Compressors
7.3-40	1 of 4	437634-1	Schematic Diagram - Control Rod Drive Motor Generator Set (4 Sheets)
7.3-40	2 of 4	437603-1	
7.3-40	3 of 4	441488-1	
7.3-40	4 of 4	441487-1	
7.3-41		437657-1	Schematic Diagram - Diesel Fuel Transfer Pumps
7.3-42	1 of 2	437679-1	Schematic Diagram - Main Steam Isolation Valves (2 sheets)
7.3-42	2 of 2	441296-1	
7.3-43	1 of 2	437680-1	Schematic Diagram - Sampling System Solenoid Valves (2 sheets)
7.3-43	2 of 2	441329-1	
7.3-44	1 of 2	437681-1	Schematic Diagram - Component Cooling Water Solenoid Valves (2 sheets)
7.3-44	2 of 2	441330-1	
7.3-45	1 of 4	437682-1	Schematic Diagram - Chemical and Volume Control System Solenoid Valves (4 Sheets)
7.3-45	2 of 4	437683-1	
7.3-45	3 of 4	441326-1	
7.3-45	4 of 4	441327-1	

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Figure	Sheet	Drawing	Description
7.3-46	1 of 2	437684-1	Schematic Diagram - Liquid Radwaste Solenoid Valves (2 sheets)
7.3-46	2 of 2	441319-1	
7.3-47	1 of 2	437685-1	Schematic Diagram - Steam Generator Blowdown Solenoid Valves (2 sheets)
7.3-47	2 of 2	441461-1	
7.3-48	1 of 4	437557-1	Schematic Diagram - Generator Control (4 Sheets)
7.3-48	2 of 4	437558-1	
7.3-48	3 of 4	441245-1	
7.3-48	4 of 4	441246-1	
7.3-49	1 of 2	437701-1	Schematic Diagram - Permissive and Bypass Lights (2 sheets)
7.3-49	2 of 2	441369-1	
7.3-50	1 of 3	445650-1	Separation and Color Code Instrumentation and Control - Engineered Safety Features (3 Sheets)
7.3-50	2A of 3	442561-1	
7.3-50	2 of 3	445651-1	
7.3-52	1 of 4	057673-1	Containment Electrical Penetrations, Cable Trays, and Supports (4 Sheets)
7.3-52	2 of 4	501445-1	
7.3-52	3 of 4	500603-1	
7.3-52	4 of 4	500793-1	
7.6-1	1 of 6	437547-1	Instrumentation and Control Power Supply (6 Sheets)
7.6-1	2 of 6	445290-1	
7.6-1	3 of 6	445291-1	
7.6-1	4 of 6	441241-1	
7.6-1	5 of 6	445390-1	
7.6-1	6 of 6	445391-1	
7.7-6		495860-1	Unit 1: Functional Logic Diagram, Digital Feedwater Control System, FW Flow Controller & Cv Demand
7.7-6		495890-1	Unit 2: Functional Logic Diagram, Digital Feedwater Control System, FW Flow Controller & Cv Demand

Figure	Sheet	Drawing	Description
7.7-7		495853-1	Unit 1: Functional Logic Diagram, Digital Feedwater Control System, Feedwater Control & Isolation
7.7-7		495883-1	Unit 2: Functional Logic Diagram, Digital Feedwater Control System, Feedwater Control & Isolation
7.7-16		507613-1	Arrangement of Control Room
7.7-17		504479-1	Location of Control Console and Main Control Board
7.7-18		521120-1	Arrangement of Control Console Nuclear Instrumentation System (CC1), Primary Plant Control (CC2), and Secondary Plant Control (CC3) - Unit 1
7.7-19		521130-1	Arrangement of Control Console Nuclear Instrumentation System (CC1), Primary Plant Control (CC2), and Secondary Plant Control (CC3) - Unit 2
7.7-20		521121-1	Arrangement of Main Control Board - Engineered Safety Systems (VB1) - Unit 1
7.7-21		521131-1	Arrangement of Main Control Board - Engineered Safety Systems (VB1) - Unit 2
7.7-22		521122-1	Arrangement of Main Control Board - Primary Plant Systems (VB2) - Unit 1
7.7-23		521132-1	Arrangement of Main Control Board - Primary Plant Systems (VB2) - Unit 2
7.7-24		521123-1	Arrangement of Main Control Board - Steam and Turbine (VB3) - Unit 1
7.7-25		521133-1	Arrangement of Main Control Board - Steam and Turbine (VB3) - Unit 2
7.7-26		521124-1	Arrangement of Main Control Board - Auxiliary Equipment and Diesel VB4) - Unit 1
7.7-27		521134-1	Arrangement of Main Control Board - Auxiliary Equipment and Diesel VB4) - Unit 2
7.7-28		521125-1	Arrangement of Main Control Board - Station Electric (VB5) - Unit 1
7.7-29		521135-1	Arrangement of Main Control Board - Station Electric (VB5) - Unit 2
7.7-30	1 of 3 (U2)	480237-1	Arrangement of Hot Shutdown Remote Control Panel (3 sheets)
7.7-30	2 of 3 (U1)	491716-1	
7.7-30	3 of 3 (U2)	494122-1	

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Figure	Sheet	Drawing	Description
7.7-31		330557-1	Arrangement of Auxiliary Building Control Panel
8.1-1		502110-1	Plant Single Line Diagram
8.2-3		57483-1	General Arrangement 230-kV and 500-kV Switchyard
8.2-6		500804-1	Arrangement of 12-kV Startup Transformers
8.3-1	1 of 2	437529-1	Single Line Meter and Relay Diagram - Generator, Main, and Auxiliary Transformers, and Excitation (2 sheets)
8.3-1	2 of 2	441226-1	
8.3-2	1 of 2	437531-1	Single Line Meter and Relay Diagram - 12-kV System (2 sheets)
8.3-2	2 of 2	441227-1	
8.3-3	1 of 2	437532-1	Single Line Meter and Relay Diagram - 4-kV System (2 sheets)
8.3-3	2 of 2	441228-1	
8.3-4	1 of 3	437533-1	Single Line Meter and Relay Diagram - 4-kV System (Vital Bus) (3 sheets)
8.3-4	2 of 3	441229-1	
8.3-4	3 of 3	441230-1	
8.3-5		437530-1	Single Line Meter and Relay Diagram - 12-kV Startup System
8.3-6	1 of 2	437916-1	Single Line Meter and Relay Diagram - 480-V System Bus Section F (Vital Bus) (2 sheets)
8.3-6	2 of 2	441237-1	
8.3-7	1 of 2	437542-1	Single Line Meter and Relay Diagram - 480-V System Bus Section G (Vital Bus) (2 sheets)
8.3-7	2 of 2	441238-1	
8.3-8	1 of 2	437543-1	Single Line Meter and Relay Diagram - 480-V System Bus Section H (Vital Bus) (2 sheets)
8.3-8	2 of 2	441239-1	
8.3-9	1 of 2	437625-1	Schematic Diagram - 4-kV Bus Section F Automatic Transfer (2 sheets)
8.3-9	2 of 2	441352-1	
8.3-10	1 of 2	437626-1	Schematic Diagram - 4-kV Bus Section G Automatic Transfer (2 sheets)
8.3-10	2 of 2	441353-1	
8.3-11	1 of 2	437627-1	Schematic Diagram - 4-kV Bus Section H Automatic Transfer (2 sheets)
8.3-11	2 of 2	441354-1	

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Figure	Sheet	Drawing	Description
8.3-12	1 of 11	437579-1	Schematic Diagram - 4-kV Diesel Generators Controls (11 Sheets)
8.3-12	2 of 11	437580-1	
8.3-12	3 of 11	437667-1	
8.3-12	4 of 11	437668-1	
8.3-12	5 of 11	441357-1	
8.3-12	6 of 11	441358-1	
8.3-12	7 of 11	496277-1	
8.3-12	8 of 11	496278-1	
8.3-12	9 of 11	496279-1	
8.3-12	10 of11	496280-1	
8.3-12	11 of 11	496281-1	
8.3-13	1 of 7	437665-1	Schematic Diagram - 4-kV Diesel Generators and Associated Circuit Breakers (7 Sheets)
8.3-13	2 of 7	437676-1	
8.3-13	3 of 7	437666-1	
8.3-13	4 of 7	441355-1	
8.3-13	5 of 7	441356-1	
8.3-13	6 of 7	496275-1	
8.3-13	7 of 7	496276-1	
8.3-14	1 of 3	437674-1	Schematic Diagram - 4-kV Diesel Generators Auxiliary Motors (3 sheets)
8.3-14	2 of 3	441359-1	
8.3-14	3 of 3	496282-1	
8.3-16	1 of 6	458863-1	Logic Diagram - Automatic Transfer 4-kV buses F, G, and H (6 Sheets)
8.3-16	2 of 6	458864-1	
8.3-16	3 of 6	458865-1	
8.3-16	4 of 6	441286-1	
8.3-16	5 of 6	441297-1	
8.3-16	6 of 6	441337-1	
8.3-17	1 of 4	437546-1	Class 1E 125-Vdc System (4 Sheets)
8.3-17	2 of 4	445076-1	
8.3-17	3 of 4	445075-1	
8.3-17	4 of 4	441240-1	
8.3-18	1 of 2	455065-1	Normal (Non-Class 1E) 125-V and 250-Vdc System (2 sheets)

Figure	Sheet	Drawing	Description
8.3-18	2 of 2	445295-1	
8.3-19	1 of 2	437545-1	Pressurizer Heaters, Single Line Diagram (2 sheets)
8.3-19	2 of 2	441218-1	
8.3-20	1 of 2	437614-1	Schematic Diagram Potential and Synchronizing 4160-Volt System (Vital Bus) (2 sheets)
8.3-20	2 of 2	441340-1	
9.4-1		511157-1	Air Conditioning, Heating, Cooling, and Ventilation Systems - Control Room
9.4-2	1 of 2	59316-1	Air Conditioning, Cooling, and Ventilation Systems - Auxiliary Building (2 sheets)
9.4-2	2 of 2	501365-1	
9.4-3		59317-1	Ventilation Flow Diagram Containment Fuel Handling Fan Rooms (Unit 1)
9.4-3A		501366-1	Ventilation Flow Diagram Containment Fuel Handling Fan Rooms (Unit 2)
9.4-8		516103-1	Ventilation System - Inverter Rooms and 480 V Switchgear Room in Auxiliary Building
9.4-10		512904-1	Ventilation Systems - Technical Support Center and Post-Accident Sampling Room
9.5-8		508845-1	Diesel Fuel Oil Transfer Pump Vaults
9.5-9		438165-1	Diesel Generator Fuel Oil Piping
9.5-10	1 of 4	500002-1	Diesel Generator Arrangement Plan (4 sheets)
9.5-10	2 of 4	500852-1	
9.5-10	3 of 4	498992-1	
9.5-10	4 of 4	498993-1	
9.5-11	1 of 2	500003-1	Diesel Generator Arrangement Sections (2 sheets)
9.5-11	2 of 2	500853-1	
9.5-12		663082-2	Diesel Engine Generator (Typical)
9.5F-1		515562-1	Fire Areas, Turbine Building Elevation 85 ft
9.5F-2		515563-1	Fire Areas, Turbine Building Elevation 104 ft
9.5F-3		515564-1	Fire Areas, Turbine Building Elevation 119 ft
9.5F-4		515565-1	Fire Areas, Turbine Building Elevation 140 ft

TABLE 1.6-1

Figure	Sheet	Drawing	Description
9.5F-5		515566-1	Fire Areas, Auxiliary Building Elevation 54 ft and 64 ft
9.5F-6		515567-1	Fire Areas, Auxiliary Building Elevation 75 ft
9.5F-7		515568-1	Fire Areas, Auxiliary Building + Containment, Elevation 85 ft
9.5F-8		515569-1	Fire Areas, Auxiliary Building + Containment + Fuel Handling Elevation 100 ft
9.5F-9		515570-1	Fire Areas, Auxiliary Building + Containment + Fuel Handling Elevation 115 ft
9.5F-10		515571-1	Fire Areas, Auxiliary Building + Containment + Fuel Handling Elevation 140 ft
9.5F-11		515572-1	Fire Areas, Auxiliary Building Elevation 125'-8", 127'-4" and 163'-4"
9.5F-12		515573-1	Fire Areas, Turbine Building Elevation 85 ft
9.5F-13		515574-1	Fire Areas, Turbine Building Elevation 104 ft
9.5F-14		515575-1	Fire Areas, Turbine Building Elevation 119 ft
9.5F-15		515576-1	Fire Areas, Turbine Building Elevation 140 ft
9.5F-16		515577-1	Fire Areas, Auxiliary Building + Containment + Fuel Handling Elevation 85 ft and 100 ft
9.5F-17		515578-1	Fire Areas, Auxiliary Building + Containment + Fuel Handling Elevation 115 ft and 140 ft
9.5F-18		515580-1	Fire Areas, Intake Structure
9.5F-19		515579-1	Fire Areas, Buttress Area
10.1-1		6021770-30	Unit 2: Heat Balance Diagram - Maximum Calculated – Post LP Retrofit
10.1-2		6021770-22	Unit 2: Heat Balance Diagram – 100% RTO – Post LP Retrofit
10.1-5		6021770-19	Unit 1: Heat Balance Diagram - Maximum Calculated – Post LP Retrofit
10.1-6		6021770-5	Unit 1: Heat Balance Diagram - 100% RTO – Post LP Retrofit
11.5-5		502699-1	Solid Radwaste Storage Building

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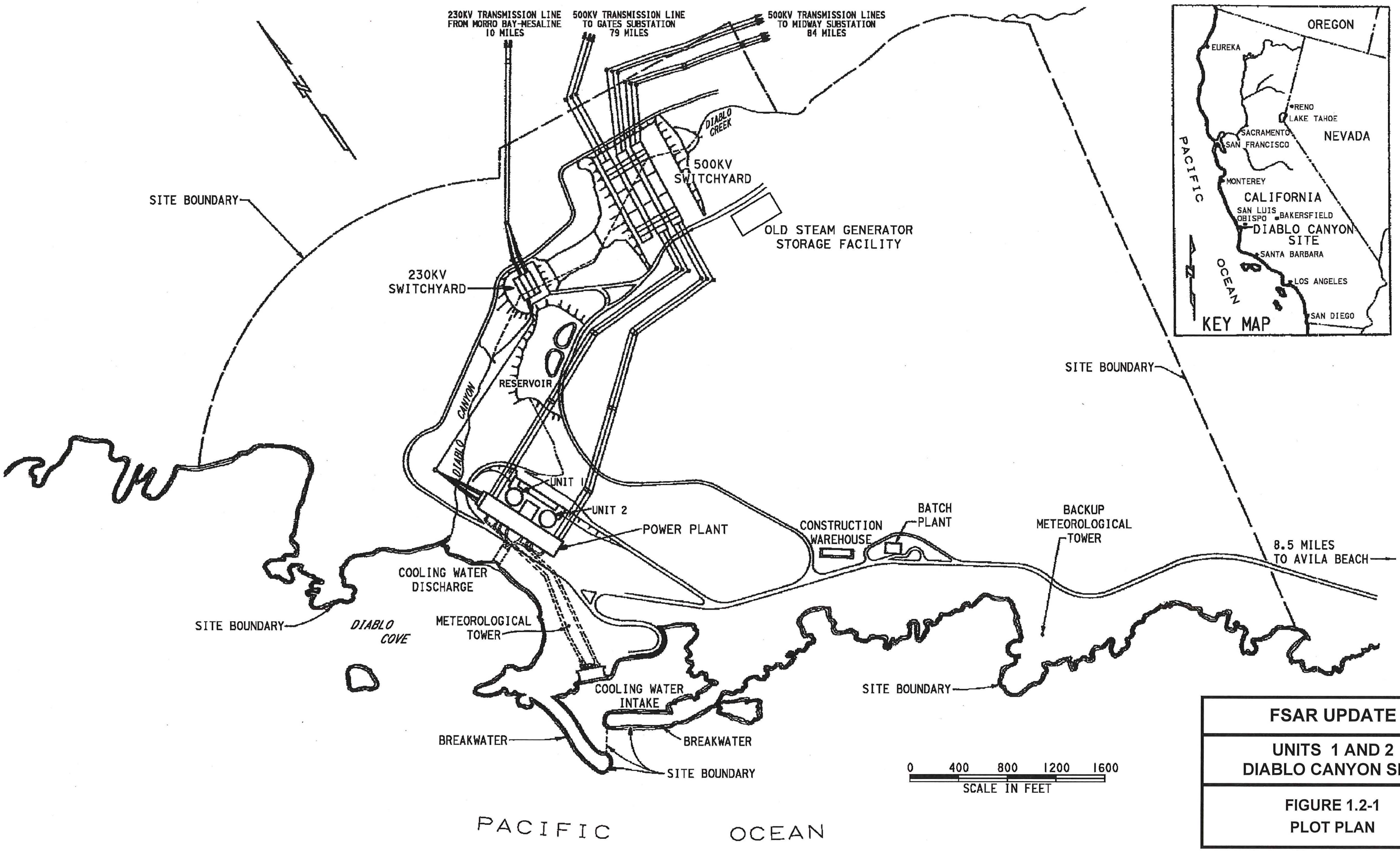
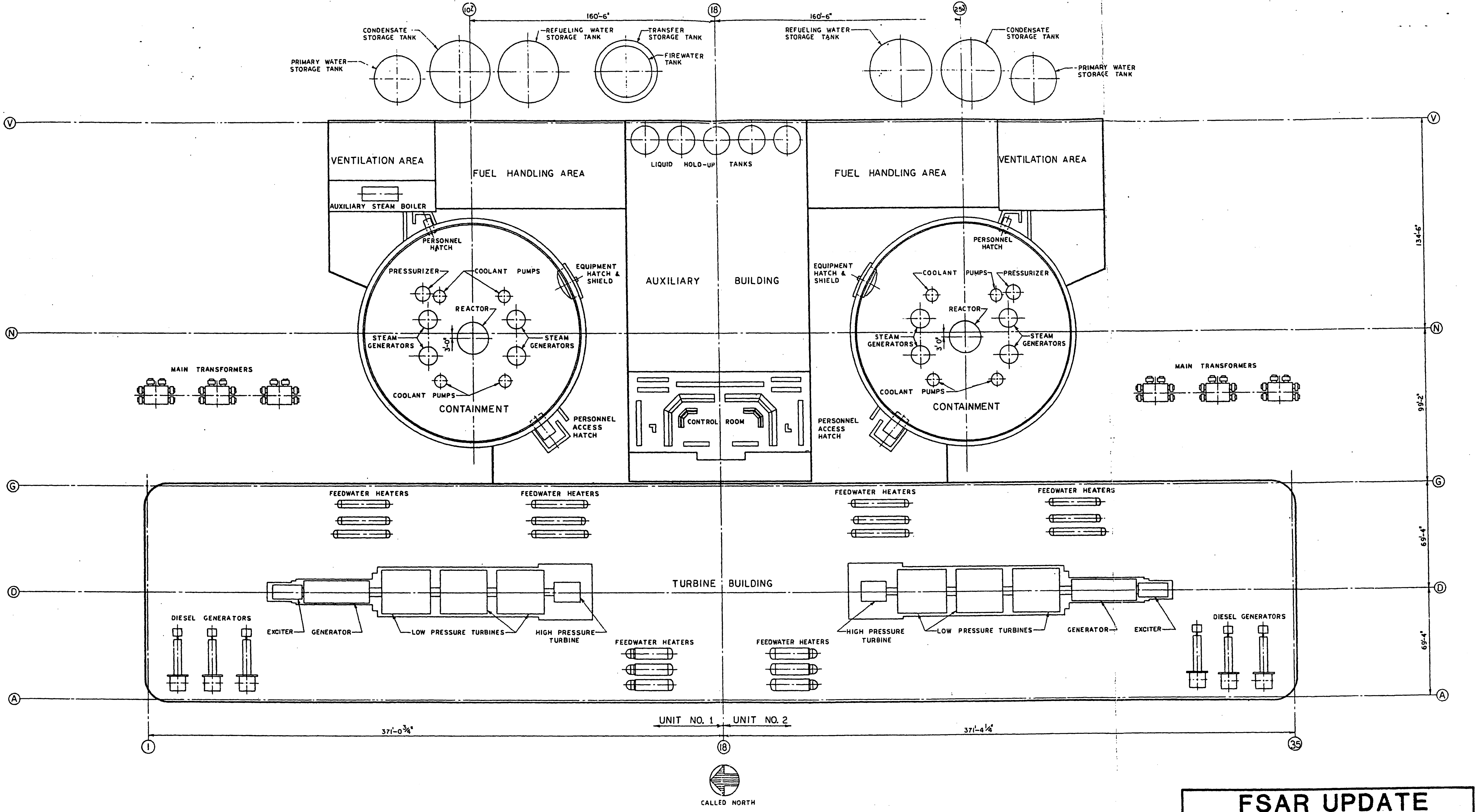


FSAR UPDATE

UNITS 1 AND 2
DIABLO CANYON SITE

FIGURE 1.2-1
PLOT PLAN

Revision 18 October 2008



FSAR UPDATE

UNITS 1 AND 2
DIABLO CANYON SITE

FIGURE 1.2-2
PLANT LAYOUT

Revision 11A April 1997