

1 GENERAL DESCRIPTION

1.1 Conduct of Review

On December 21, 2001, the Pacific Gas and Electric (PG&E) Company submitted a license application in accordance with 10 CFR Part 72 to the U.S. Nuclear Regulatory Commission (NRC) to construct and operate an onsite independent spent fuel storage installation (ISFSI) at the Diablo Canyon Power Plant (DCPP). Included in the PG&E license application is the Safety Analysis Report (SAR). Chapter 1 of the SAR explains the need for the Diablo Canyon ISFSI and provides a general description of the site, the major components and operations of the ISFSI, and the co-located DCPP. The objective of this chapter of the SAR is to familiarize the reader with the pertinent features of the ISFSI.

1.1.1 Introduction to the Diablo Canyon ISFSI

The proposed Diablo Canyon ISFSI will use dry-cask, spent-fuel storage technology. In accordance with 10 CFR §72.42, the initial term for an ISFSI license is 20 years. Before the end of this license term, an applicant may submit an application to renew the license. Prior to license expiration, all spent nuclear fuel will be transferred offsite, and the ISFSI will be ready for decommissioning.

The Diablo Canyon ISFSI will be co-located with the DCPP on PG&E-owned property, located on the California coast approximately 10 km [6 mi] northwest of Avila Beach, California. The DCPP consists of two nuclear-generating units, each having a spent fuel pool to store spent nuclear fuel generated from reactor operation. The Diablo Canyon ISFSI will provide additional spent nuclear fuel storage capacity to DCPP beyond 2006, when the current wet pool storage will be near full capacity. Where applicable, the Diablo Canyon ISFSI SAR utilizes site-specific information previously presented in the DCPP Final Safety Analysis Report (FSAR). The DCPP FSAR was accepted by the NRC when it granted the operating licenses of the two DCPP units in accordance with 10 CFR Part 50. The DCPP FSAR is maintained through periodic revisions in accordance with 10 CFR §50.71(e). In support of its review of the ISFSI application, the staff reviewed selected portions of the DCPP FSAR, Revision 14 (Pacific Gas and Electric Company, 2001b).

The two reactor units of DCPP share a common fuel-handling building and auxiliary building as well as components of auxiliary systems. Each unit has a dedicated fuel-handling system and spent nuclear fuel pool. Both units share a single 125 ton-[113,398 kg]-capacity crane for fuel handling activities. Each reactor core contains 193 fuel assemblies, and both units are currently operating on 18 to 21 month refueling cycles. Typically, 76 to 96 spent nuclear fuel assemblies are permanently discharged from each unit during a refueling.

The Diablo Canyon ISFSI will consist of the dry-cask storage system, a Cask Transfer Facility (CTF), an onsite cask transporter, and the storage pads. The Diablo Canyon ISFSI will use the currently approved HI-STORM 100 System with a modified cask anchoring system to be approved as part of this site-specific license.

The Diablo Canyon ISFSI is designed to hold up to 140 storage casks. Based on the current fuel strategy and the principal use of the multi-purpose canister (MPC) that contains a

maximum of 32 pressurized water reactor fuel assemblies (MPC-32), the Diablo Canyon ISFSI will be capable of storing all of the spent nuclear fuel generated by the two DCPD reactors during the terms of their current operating licenses. In addition, to accommodate spent nuclear fuel generated during the ISFSI licensed period, as well as any damaged fuel assemblies, debris, and nonfuel hardware, PG&E may use three other MPC designs from the HI-STORM 100 System, including the MPC-24, MPC-24E, and MPC-24EF designs. All four MPC designs use the same storage overpack and are approved for use by general licensees under the Certificate of Compliance No. 1014, Amendment 1 (U.S. Nuclear Regulatory Commission, 2002), for the HI-STORM 100 System. The applicant proposes to begin construction of the Diablo Canyon ISFSI in 2004 and plans to begin operation in 2006.

1.1.2 General Description of the Location

The Diablo Canyon ISFSI will be located within the PG&E owner-controlled area at the DCPD site, which consists of approximately 300 hectares [750 acres] of land located in San Luis Obispo County, California. The area is directly southeast of Montana de Oro State park and is approximately 19 km [12 mi] west-southwest of the city of San Luis Obispo, California, the county seat and nearest significant population center. Only a few individuals reside within 8 km [5 mi] of the DCPD site. The nearest residential community is Los Osos, approximately 13 km [8 mi] north of the plant site. A number of other cities, as well as some unincorporated residential areas, exist along the coast and inland. However, these population areas are more than 13 km [8 mi] from the DCPD site.

A security fence defines the Diablo Canyon ISFSI protected area within the DCPD owner-controlled area, which is surrounded by a separate fence. The DCPD site is located near the mouth of Diablo Creek, and a portion of the site is bounded by the Pacific Ocean. All coastal properties north of Diablo Creek, extending north to the southerly boundary of Montana de Oro State Park and reaching inland approximately 1 km [0.5 mi] are owned by PG&E. Coastal properties south of Diablo Creek and reaching inland approximately 1 km [0.5 mi] are owned by Eureka Energy Company, a wholly owned subsidiary of PG&E. PG&E has complete authority to control all activities within the site boundary, and this authority extends to the mean high water line along the ocean. The DCPD site is not traversed by any public highway or railroad. Normal access to the site is from the south by private road through the owner-controlled area, which is fenced and posted by PG&E.

The DCPD occupies a coastal terrace that ranges in elevation from 18 to 46 m [60 to 150 ft] above mean sea level and is approximately 300 m [1,000 ft] wide. The coastal areas surrounding the DCPD are well drained, primarily through Diablo Creek, and groundwater is at least 52 m [170 ft] below the surface of the ISFSI pad. Winter is the rainy season, more than 80 percent of the average annual rainfall of approximately 41 cm [16 in] occurs during the winter months. The average annual temperature of the site area is approximately 13°C [55°F], with a variation between approximately 0°C [32°F] minimum and 36°C [97°F] maximum.

The staff finds that the site and Diablo Canyon ISFSI descriptions have sufficient detail to allow familiarization with the site characteristics of the proposed ISFSI.

1.1.3 General Systems Description

The major structures, systems, and components (SSCs) of the Diablo Canyon ISFSI will include the dry-cask storage system, CTF, onsite transporter, and the storage pads. The dry-cask storage system that has been identified for use at the ISFSI is the HI-STORM 100 System (the cask system). The cask system is a canister-based storage system that stores spent nuclear fuel in a vertical orientation. It consists of three discrete components: the MPC, the HI-TRAC 125 Transfer Cask, and the HI-STORM 100 System Overpack (also referred to as the storage cask). The MPC is the confinement system for the stored fuel. The HI-TRAC 125 Transfer Cask provides radiation shielding and structural protection of the MPC during transfer operations, while the storage overpack provides radiation shielding and structural protection of the MPC during storage. The HI-STORM 100 System is passive and does not rely on any active cooling systems to remove spent nuclear fuel decay heat. As discussed in Section 1.1.1, the Diablo Canyon ISFSI will use the approved HI-STORM 100 System, through Amendment 1 of the Certificate of Compliance No. 1014 (U.S. Nuclear Regulatory Commission, 2002), with a modified cask anchoring system to be approved as part of this site-specific license.

The spent nuclear fuel will be loaded into an MPC in the transfer cask in one of the DCPD spent fuel pools. After the loaded MPC and transfer cask are removed from the pool, the canister lid will be welded in place, and the canister will be drained, dried, filled with an inert gas, sealed, and leak tested. The cask transporter will be used to move the HI-TRAC 125 Transfer Cask containing a loaded MPC from the DCPD fuel handling building/auxiliary building (FHB/AB) to the CTF, which will be adjacent to the ISFSI storage pads. The transfer cask will then be placed on top of the empty overpack in the CTF using the cask transporter. In the CTF, the MPC will be lowered from the HI-TRAC 125 Transfer Cask into the storage overpack positioned beneath it. The storage overpack, once loaded with the MPC, will then be closed and moved to the storage area again using the cask transporter. The loaded overpack will be placed in the ISFSI in a vertical orientation, where it will be anchored to the concrete storage pad.

A general description of the cask system and its operation is provided in the Diablo Canyon ISFSI SAR. A detailed description of the cask system is given in the FSAR for the HI-STORM 100 System (Holtec International, 2000) and in Holtec HI-STORM 100 System License Amendment Request (LAR) 1014-1 (Holtec International, 2001). The staff finds that the description of the storage cask system to be used at the ISFSI is sufficiently detailed to allow familiarization with its design.

1.1.4 Identification of Agents and Contractors

Section 1.4 of the SAR identifies the organizations responsible for providing the licensed spent nuclear fuel storage and transfer systems and engineering, design, licensing, and operation of the ISFSI. Holtec International is responsible for the design of the HI-STORM 100 System and the cask transporter, and design criteria for the storage pads and CTF. PG&E has overall responsibility for engineering, site preparation, and construction of the ISFSI storage pads and CTF, using specialty contractors as necessary. The applicant is also responsible for operating the ISFSI and providing quality assurance services.

The staff finds that the agents and contractors responsible for the design and operation of the installation have been adequately identified.

1.1.5 Material Incorporated by Reference

Many chapters of the ISFSI SAR, through Amendment 2 (Pacific Gas and Electric Company, 2003), include a reference section that identifies documents referred to in those chapters. The primary documents referenced in the Diablo Canyon ISFSI SAR include the DCPD FSAR (Pacific Gas and Electric Company, 2001b) and the Holtec HI-STORM 100 SAR, through Amendment 1 (Holtec International, 2001). Other primary documents relied on by PG&E are listed in Table 1 in the Executive Summary of this SER.

The staff finds that material incorporated by reference, including topical reports and docketed material, has been appropriately identified in the SAR.

1.2 Evaluation Findings

The staff finds that the site and Diablo Canyon ISFSI descriptions presented in Chapter 1 of the SAR have sufficient detail to allow familiarization with the pertinent site-related features of the proposed Diablo Canyon ISFSI.

1.3 References

Holtec International. *Final Safety Analysis Report for the Holtec International Storage and Transfer Operation Reinforced Module Cask System (HI-STORM 100 Cask System)*. Volumes I and II. HI-2002444. Docket No. 72-1014. Marlton, NJ: Holtec International. 2000.

Holtec International. *License Amendment Request 1014-1, Revision 2*, July 2001, including Supplements 1 through 4 dated August 17, 2001; October 5, 2001; October 12, 2001; and October 19, 2001. Marlton, NJ: Holtec International. 2001.

Pacific Gas and Electric Company. *Diablo Canyon ISFSI Safety Analysis Report*. Docket No. 72-26. Avila Beach, CA: Pacific Gas and Electric Company. December 2001a.

Pacific Gas and Electric Company. *Diablo Canyon Power Plant Units 1 & 2 Final Safety Analysis Report Update*. Revision 14. Avila Beach, CA: Pacific Gas and Electric Company. November 2001b.

Pacific Gas and Electric Company (PG&E). *Diablo Canyon ISFSI Safety Analysis Report*. Amendment 1. Docket No. 72-26. Avila Beach, CA: Pacific Gas and Electric Company. October 2002.

Pacific Gas and Electric Company (PG&E). *Diablo Canyon ISFSI Safety Analysis Report*. Amendment 2. Docket No. 72-26. Avila Beach, CA: Pacific Gas and Electric Company. October 2003.

U.S. Nuclear Regulatory Commission. *10 CFR Part 72 Certificate of Compliance No. 1014, Amendment 1, for the HI-STORM 100 Cask System*. Docket No. 72-1014. Washington, DC: U.S. Nuclear Regulatory Commission. July 15, 2002.