

DECOMMISSIONING SAN ONOFRE NUCLEAR GENERATING STATION

Southern California Edison (SCE) announced June 7, 2013 that it will permanently retire Units 2 and 3 of its San Onofre nuclear plant. SCE concluded that continuing uncertainty about when or if San Onofre Unit 2 might return to service was not good for customers, investors or the need to plan for the region's long-term electricity needs.

KEY FACTS

- Units 2 and 3 of the San Onofre nuclear plant, located near San Clemente, Calif., were capable of generating 2,200 megawatts of electricity, enough power to serve 1.4 million average homes at any point in time.
- San Onofre Unit 2 began commercial operation in 1983 and Unit 3 in 1984. Unit 1 went into service Jan. 1, 1968 and was retired in 1992.
- San Onofre is jointly owned by SCE (78.21 percent), San Diego Gas & Electric (20 percent) and the city of Riverside (1.79 percent).

CURRENT STATUS

SCE formally notified the Nuclear Regulatory Commission (NRC) on June 12, 2013, that it had permanently ceased operation of Units 2 and 3 on June 7, 2013. The notification, called a Certification of Permanent Cessation of Power Operations, sets the stage for SCE to begin preparations for decommissioning. Decommissioning is a well-defined NRC process that involves transferring the used fuel into storage containers, followed by the removal and disposal of radioactive components and materials. Longer term, this process calls for reducing residual radioactivity to a level that supports termination of the NRC license. The NRC requires that decommissioning be completed within 60 years. SCE will provide updates at www.songscommunity.com.

DECOMMISSIONING FUNDING

Nuclear power plants are required by the NRC to put aside funds for decommissioning while the plant is operating. The California Public Utilities Commission (CPUC) regulates utilities that own nuclear plants in the state and has allowed SCE to collect those funds during San Onofre's operating years. The money is collected from customers and invested in dedicated trusts. The cost to decommission San Onofre Units 2 and 3 is estimated to be \$4.1 billion. SCE's share is \$3 billion, of which \$2.7 billion had been collected through March 31. Other co-owners collected more than \$927 million through December 2012. SCE submitted an updated decommissioning estimate to the utilities commission in July 2013 to reflect the plant's permanent shutdown.

DECOMMISSIONING PROCESS

Since 1960, more than 70 test, demonstration and power reactors have been retired throughout the United States. SCE formally notified the NRC on June 12, 2013 that operations at San Onofre have permanently ceased. On July 23, 2013, SCE notified the NRC it had transferred fuel from the Unit 2 reactor to the spent fuel pool. The company had previously defueled Unit 3. Once fuel was removed from both reactors, San Onofre transitioned from an operating to a "possession" license. Within two years of shutdown, SCE must submit to the NRC and state officials a detailed plan that spells out specific decommissioning activities and schedules, cost estimates and potential environmental impacts. Public review and comment is an important part of this process, and NRC oversight of decommissioning continues. The NRC addresses frequently asked questions at <http://www.nrc.gov/about-nrc/regulatory/decommissioning/faq.html>.

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Q&A

How does San Onofre manage used nuclear fuel?

San Onofre currently stores used nuclear fuel safely and securely using a combination of technologies: enclosed, steel-lined concrete pools filled with water (spent fuel pools) and in sealed stainless steel canisters that are housed in reinforced concrete structures (dry cask storage). The NRC has determined that used fuel could be stored safely for at least 60 years after the unit has ceased commercial operation.

Large stainless steel canisters hold used fuel assemblies that are made of sealed fuel rods that contain the uranium pellets that have been used to generate power. San Onofre currently has about 2,776 fuel assemblies in spent fuel pools in Units 2 and 3 and about 800 Unit 2 and 3 fuel assemblies in dry cask storage. In addition, there are about 400 Unit 1 used fuel assemblies in dry cask storage on site. The Nuclear Energy Institute reports that 78 percent of spent fuel from U.S. commercial nuclear plants is stored in spent fuel pools and 22 percent in dry storage.

What is an independent spent fuel storage installation (ISFSI)?

An independent spent fuel storage installation or ISFSI is a facility designed and constructed for the interim storage of spent nuclear fuel and related radioactive materials. The dry cask storage system must meet strict NRC design and performance specifications before the NRC certifies it. San Onofre's ISFSI currently has 51 dry storage canisters containing used fuel from Units 1, 2 and 3.

How does dry cask storage work?

Dry storage involves sealing used or spent fuel in airtight steel (or in steel and concrete) containers or casks that provide both structural strength and shielding. Used fuel cannot be transferred to a canister until it has cooled in a spent fuel pool for at least five years. Dry cask storage systems are designed to withstand various natural phenomena such as floods, projectiles from a tornado, seismic events, temperature extremes and lightning strikes. Interim storage is necessary because the federal government failed to fulfill its contractual obligation to open a permanent nuclear spent fuel facility that would permit off-site storage of San Onofre spent fuel. SCE, like other nuclear generator operators, has successfully sued the federal government for this failure. SCE has received \$112 million as its share from the federal government, and has proposed to the CPUC that the bulk of this amount be refunded to customers.

What would happen to a spent fuel pool during an earthquake?

All spent fuel pools are designed to seismic standards consistent with other important safety-related structures on the site. The pool and its supporting systems, including thick walls and floors, provide structural integrity and further protection of the fuel from natural phenomena and debris. In addition, the deep water above the stored fuel (typically more than 23 feet above the top of the spent fuel rods) is recirculated to ensure that cooling is continuously provided to remove residual heat from the fuel. The racks that support the fuel are designed to keep the fuel in its designed configuration after a seismic event.

PRELIMINARY MILESTONES

June 7, 2013	June 12, 2013	July 2013	2013-2015
SCE announces it will permanently retire San Onofre Units 2 and 3.	SCE notifies the NRC it has permanently ceased operation of Units 2 and 3.	SCE transfers fuel from San Onofre Unit 2 reactor to the spent fuel pool, triggering a federal license change to an NRC possession license from an NRC operating license.	Within two years of permanently ceasing operation, SCE will submit to the NRC a detailed decommissioning plan and schedule known as a Post-Shutdown Decommissioning Activities Report.