



**JIM DESMOND**  
SUPERVISOR, FIFTH DISTRICT  
SAN DIEGO COUNTY BOARD OF SUPERVISORS

**AGENDA ITEM**

**DATE:** December 9, 2025

**01**

**TO:** Board of Supervisors

**SUBJECT**

**EXPLORE OPPORTUNITIES TO RELOCATE THE SPENT NUCLEAR FUEL AT THE DECOMMISSIONED SAN ONOFRE NUCLEAR GENERATING STATION (SONGS) TO AN OFF-SITE LOCATION FOR REPROCESSING RESEARCH AND DEVELOPMENT (DISTRICTS: ALL)**

**OVERVIEW**

Throughout the United States (U.S.) there are currently 95 licensed commercial nuclear power plants (reactors) in operation, generating roughly 20% of the nation's electricity. Additionally, close to 20 commercial nuclear reactors in the U.S. have been permanently shut down and are either undergoing or have completed the decommissioning process, which includes dismantling, site cleanup, and environmental restoration. The San Onofre Nuclear Generating Station (SONGS) located in the northwest corner of the County of San Diego (County), adjacent to San Onofre State Beach and approximately 10 miles south of the City of San Clemente, was operated from 1968 to 2013. It ceased all nuclear operations in June of 2013 due to excessive vibrations and other issues that degraded tubes in the steam generators. SONGS is currently in year five of an eight-year dismantling process of facilities and equipment at the site.

The fission process in which power is derived from a nuclear reactor (e.g., splitting uranium nuclei) produces radioactive waste, typically referred to as spent nuclear fuel (SNF). These are highly hazardous materials left over in the fuel assemblies from the fission reactions that took place in the core of the reactor. To protect the public and the environment from radiological contamination and minimize the risk of nuclear weapons proliferation, these materials must be stored extremely carefully and with the highest-level security. To ensure the proper and safe long-term storage of the nation's SNF it must ultimately be relocated to a deep geological repository (repository) several hundreds of meters below the Earth's surface. Such a facility would provide a stable, secure, and isolated environment that allows the SNF to undergo radioactive decay over time, safely separated from people and the biosphere.

The Nuclear Waste Policy Amendment Act of 1987 identified Yucca Mountain in Nevada as the nation's only site for a repository; however, due to opposition from the state's congressional leaders, local governments and residents, Yucca Mountain is no longer considered a realistic candidate. Due to the lack of a national repository, nuclear power plants throughout the country are left storing their SNF onsite in interim storage facilities. This includes SONGS, which

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continues to store roughly 1,400 metric tons in dry cask storage (combination of steel canisters and concrete barriers).

Because there is no solution in the foreseeable future for a permanent off-site repository, we must be open to alternative paths that could reduce and/or eliminate the amount of SNF currently being held at SONGS. One such path would be to reprocess the SNF in advanced nuclear reactors and/or other emerging technologies and methods at an off-site location. Reprocessing broadly refers to separating out the “unburned” fuel (uranium and plutonium) from the “spent” materials produced by the nuclear fission that took place in the reactor when it was operating and producing power. Nearly 95% of SNF consists of uranium and 1% is made up of plutonium that was produced during fission reactions within the uranium fuel. Both the leftover uranium and plutonium in SNF can be used for new fuel.

The conventional means for reprocessing SNF is the PUREX (plutonium-uranium extraction) method, which chemically separates the uranium and plutonium and converts each to a powder form that can be turned into new fuel “pellets.” These pellets are what make up the fuel in the assemblies used to sustain fission reactions in nuclear power plants. Though the PUREX method is effective, a longstanding issue with the process - and in large part why the U.S. abandoned commercial reprocessing decades ago - is that it produces a resource stream of fully separated *weapons-useable* plutonium. In the wrong hands this material could be used to produce a nuclear weapon, increasing proliferation risks. However, other emerging technologies and advanced methods may show promise in being able to reprocess SNF in a way that extracts uranium only without separating the plutonium. This includes methods like UREX (uranium extraction only), pyro processing (high-temperature electrochemical extraction) and electrometallurgical refining (molten salt/electrolysis extraction).

For example, Oklo, Inc. (Oklo), a California-based company in the business of building advanced fission reactors, is actively working in close coordination with the U.S. Department of Energy (DOE) and Argonne National Laboratory to build the first privately funded reprocessing facility in Oak Ridge, TN. Oklo is pursuing advanced reprocessing methods that would not create pure streams of plutonium, producing a fuel profile suited for advanced (fast) fission reactors. They plan to produce new fuel from SNF at a commercial scale by the late 2020s to early 2030s. Furthermore, the Idaho National Laboratory, hosting some of the nation’s most cutting-edge facilities for nuclear energy research and development, is actively pursuing research into advanced nuclear fuels, advanced nuclear reactors, microreactors, molten salt reactors, and much more. Partnering with one or both National Laboratories may provide significant benefits and ultimately expedite the removal and relocation of the SNF at SONGS to an off-site location for research and development. It’s in this spirit of innovation and problem solving that a renewed interest is taking hold in some federal lawmakers and industry stakeholders. As a County, we should position ourselves to participate this “nuclear renaissance” and join in the growing demand to finally do something with the SNF sitting in perpetual limbo at sites throughout the country.

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Today's item directs the Chief Administrative Officer (CAO) to explore opportunities to relocate the SNF currently being held in interim storage at SONGS to an off-site location for reprocessing research and development.

**RECOMMENDATION(S)**

**SUPERVISOR JIM DESMOND**

1. Direct the Chief Administrative Officer (CAO) to explore opportunities to support initiatives that advance efforts toward reprocessing the spent nuclear fuel currently being held in interim storage at the decommissioned San Onofre Nuclear Generating Station (SONGS), and report back to the Board in 90 days with results, including any costs and potential funding source(s) associated with potential future actions. The report should include policy, legislative and/or technological options that may include, but not be limited to:
  - a. Establishing or expanding upon existing Board of Supervisors (Board) policies to support advancements in reprocessing spent nuclear fuel to help reduce the footprint and/or expedite the relocation of spent nuclear fuel at SONGS to an off-site location for reprocessing research and development. This may include adding language to the County's legislative program to support state and federal legislation that would advance efforts to reprocess spent nuclear fuel. Broadly speaking, policy language should emphasize safety and best practices, applying the latest in technological innovations, and reducing nuclear weapons proliferation risks.
  - b. Explore potential partnerships with an established national laboratory for research and development focused on reprocessing the spent nuclear fuel (SNF) currently stored at SONGS. The objective would be to move the SNF to an off-site facility for research on advanced reprocessing techniques and its use in powering next generation / advanced reactors. This will take close coordination and engagement with multiple stakeholders including but not limited to Southern California Edison, San Diego Gas & Electric (SDGE), City of Riverside, County of Orange, Spent Fuel Solutions coalition, the U.S. Nuclear Regulatory Commission (NRC) and other relevant state and federal agencies, industry leaders in advanced nuclear technologies, community members, and a national laboratory under the U.S. Department of Energy (DOE), such as the Idaho National Laboratory and/or the Argonne National Laboratory.

**EQUITY IMPACT STATEMENT**

Storing spent nuclear fuel (SNF) in interim facilities at SONGS may be perceived as posing a health and safety concern for surrounding communities. By advocating for the relocation of the SNF currently held at SONGS for reprocessing research and development, we can take a concrete step in the direction of reducing or eliminating the amount currently being held within our region, providing benefits to surrounding communities that are most immediately concerned with perceived health and safety impacts.

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### **SUSTAINABILITY IMPACT STATEMENT**

As a County government we must be committed to responsible resource management to reduce impacts on the environment, existing communities and future generations. Storing spent nuclear fuel (SNF) at SONGS without a solution for a permanent off-site repository increases the environmental risks associated with nuclear energy, specifically at the local community level. Pursuing efforts to reduce - and ultimately eliminate - the amount of SNF currently held in interim storage at SONGS demonstrates a thoughtful and responsible consideration for managing hazardous waste located in the County.

### **FISCAL IMPACT**

Funds for this request are included in the Fiscal Year 2025-26 Operational Plan based on existing staff time in the Chief Administrative Office, Office of Economic Development and Government Affairs, the Office of County Counsel, and the Office of Emergency Services funded by existing General Purpose Revenue. There may be future costs associated with related policy development and implementation, and potential contract changes, for which County staff would return to the Board for consideration and approval. There will be no change in net General Fund costs and no additional staff years.

### **BUSINESS IMPACT STATEMENT**

N/A

### **ADVISORY BOARD STATEMENT**

N/A

### **BACKGROUND**

Nuclear power offers several advantages over both fossil fuels and renewables such as solar and wind. It produces virtually zero carbon dioxide (CO<sub>2</sub>) emissions while in operation, generates incredibly high amounts of energy within a relatively small development footprint, and provides continuous, 24 hours/7 days-a-week electricity generation. Additionally, nuclear power plants can improve air quality by avoiding emissions commonly associated with the combustion of fossil fuels, including sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), and particulate matter. However, the fission process in which power is derived from a nuclear reactor (e.g. splitting uranium nuclei) produces radioactive waste, typically referred to as spent nuclear fuel (SNF). These are highly hazardous materials left over from the fission reactions that took place in the core of the reactor, and they must be stored properly to safeguard the public from radiological contamination and reduce proliferation risks.

The Nuclear Waste Policy Amendment Act of 1987 identified Yucca Mountain in Nevada as the nation's only site for a repository; however, due to opposition from the state's congressional leaders, local governments and residents, Yucca Mountain is no longer considered a realistic candidate. Due to the lack of a national repository, nuclear power plants throughout the county are left storing their SNF onsite in interim storage facilities. This includes SONGS, which continues to store roughly 1,400 metric tons in dry cask storage (combination of steel canisters and concrete barriers). Altogether, at nuclear reactor sites throughout the U.S., there is approximately 91,000

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metric tons of SNF currently held in interim storage, perpetually awaiting a permanent off-site deep geological repository.

While the U.S. has historically struggled with nuclear reprocessing due to high costs and concerns about nuclear weapons proliferation, it's worth considering whether reprocessing could still be a viable option in 2025 and beyond. There are reasons to believe it might be, especially with renewed federal interest and the development of new technologies and methods emerging from both industry and U.S. national laboratories. Moreover, looking to other countries for insight, France continues to stand out as a leader in this area. Currently, about 17% of France's total energy comes from reprocessing SNF. France has been operating a commercial reprocessing facility at La Hague since 1966, and in recent years, the cost of generating electricity (per megawatt-hour) has significantly decreased. The U.S. reprocessed SNF during World War II to produce plutonium for nuclear weapons, but only a single commercial reprocessing facility ever operated in the country. For roughly 6 years (1966-72) a facility in West Valley, NY produced “fresh” uranium and plutonium from SNF to be recirculated back into the nuclear energy system as new fuel for commercial reactors. However, reprocessing eventually lost its appeal in the U.S. due to the high costs involved and significant concerns related to nuclear weapons proliferation.

Emerging technologies and methods show promise in being able to reprocess SNF in a way that significantly reduces the risks of nuclear proliferation and that can fuel the advanced fission reactors of the near future. Examples include methods like UREX (uranium extraction only), pyro processing (high-temperature electrochemical extraction) and electrometallurgical refining (molten salt / electrolysis extraction). Two key benefits of these advanced methods are gaining attention from some U.S. lawmakers and nuclear industry leaders. First, reprocessing could reduce the volume of SNF stored in interim facilities; both the amount of radioactive waste and the physical space needed for the eventual long-term storage in a national repository could be significantly minimized. Second, advanced reprocessing allows for the recovery of about 95% of the remaining uranium, which could be reused as new reactor fuel, reducing the need for new uranium mining.

Recent actions in the U.S. are underway to push innovations in reprocessing forward. For example, Oklo, Inc. (Oklo), a California-based company in the business of building advanced fission reactors, is actively working in close coordination with the U.S. Department of Energy (DOE) and Argonne National Laboratory to build the first privately funded reprocessing facility in Oak Ridge, TN. Oklo is pursuing advanced reprocessing methods that do not create pure streams of plutonium, producing a fuel profile suited for advanced (fast) fission reactors. They plan to produce new fuel from SNF at a commercial scale by the late 2020s to early 2030s. Furthermore, the Idaho National Laboratory, arguably hosting the nation’s most cutting-edge facilities for nuclear energy research and development, is actively pursuing research into advanced nuclear fuels, advanced nuclear reactors, microreactors, molten salt reactors, and much more. Partnering with one or both National Laboratories may provide significant benefits and ultimately expedite the removal and relocation of the SNF at SONGS to an off-site location for research and development. It’s in this spirit of innovation and problem solving that a renewed interest is taking hold in some federal lawmakers and industry stakeholders. As a County, we should position ourselves to participate this “nuclear

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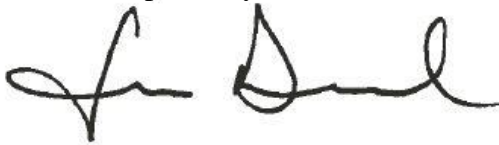
renaissance” and join in the growing demand to finally do something with the SNF sitting in perpetual limbo at sites throughout the country.

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**LINKAGE TO THE COUNTY OF SAN DIEGO STRATEGIC PLAN**

Today’s proposed actions advocating for the continued removal and relocation of spent nuclear fuel in the San Diego region support Sustainability Goals in the County of San Diego’s 2025-2030 Strategic Plan, by taking steps to cultivate a safe natural environment for residents, visitors and future residents to enjoy.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Jim Desmond', written in a cursive style.

JIM DESMOND  
Supervisor, Fifth District

**ATTACHMENT(S)**

N/A