

Date of Hearing: April 10, 2023

ASSEMBLY COMMITTEE ON NATURAL RESOURCES

Luz Rivas, Chair

AB 65 (Mathis) – As Amended February 14, 2023

**SUBJECT:** Energy: nuclear generation facilities

**SUMMARY:** Exempts “small modular reactors” (SMR, a nuclear reactor up to 300 megawatts per unit) from the conditional moratorium on permitting new nuclear fission powerplants in California. Requires the Public Utilities Commission to adopt a plan to increase the procurement of electricity generated from nuclear facilities and to phase out the procurement of electricity generated from natural gas facilities.

**EXISTING LAW** prohibits any new nuclear fission power plant until the California Energy Commission (CEC) has determined that technologies exist for the reprocessing of nuclear fuel rods and the disposal of high-level nuclear waste. (Public Resources Code 25524.1 and 25524.2)

**FISCAL EFFECT:** Unknown

**COMMENTS:**

- 1) **Background.** Since 2012, only one of the four nuclear power plants developed in California by electric utilities has continued to operate: PG&E’s Diablo Canyon powerplant. Two others, PG&E’s Humboldt Bay plant and SMUD’s Rancho Seco plant, have been decommissioned. Developed in the early 1960’s, Humboldt Bay was shut down in 1976 for refueling and never restarted due to seismic and cost issues. Developed in the early 1970’s, Rancho Seco was shut down in 1989 in response to voter referendum. The fourth, the San Onofre Nuclear Generating Station (SONGS) jointly owned by Southern California Edison and San Diego Gas and Electric, was closed in 2012 for repairs, permanently retired in 2013, and is in the process of decommissioning. High-level radioactive waste from these plants’ operation remains stored on site.

In 1976, the Legislature passed AB 2820 (Goggin) and AB 2822 (Nestande) to establish a moratorium on permitting new nuclear powerplants. Since that time, the CEC has not found that a high-level waste disposal technology has been demonstrated or approved. Likewise, the U.S. Nuclear Regulatory Commission (NRC), which regulates commercial nuclear power plants and other uses of nuclear materials, has never made a finding that a demonstrated technology exists for either nuclear fuel rod preprocessing plants or the disposal of high-level nuclear waste.

The moratorium was challenged by PG&E and ultimately reviewed by the U.S. Supreme Court. In *PG&E v. Energy Commission*, 461 U.S. 190 (1983), the Supreme Court upheld California's moratorium law. A key basis of the Court's decision was a division of authority to make safety determinations (federal) and economic determinations (state). The Court found that the absence of a permanent waste disposal site could lead to unknown negative economic consequences. So the moratorium has remained in effect and no new nuclear plant has been proposed in California since the Diablo Canyon and SONGS units that were in the permitting pipeline at the time the moratorium was enacted.

The federal government is responsible for providing for the permanent disposal of high-level radioactive waste and spent nuclear fuel and was required to begin accepting spent nuclear fuel from nuclear power plants by 1998. However, although Congress selected the Yucca Mountain site in Nevada for a permanent deep geologic repository for the disposal of spent nuclear fuel, the federal waste disposal program has been plagued with technical and legal challenges, managerial problems, licensing delays, persistent weaknesses in quality assurance for the program, and increasing costs.

No repository or reprocessing facility for spent nuclear fuel has been licensed in the U.S. The federal waste disposal program is paid for by the nuclear electricity generators and waste owners. Under the provisions of the federal Nuclear Waste Policy Act, utilities pay regular fees to the Nuclear Waste Fund to pay for siting, construction and operating a federal waste repository. California ratepayers have paid billions to fund a repository that has never been built. Reprocessing (the separation of spent fuel into high-level wastes and reusable fuel) remains substantially more expensive than waste storage and disposal and has adverse implications for the U.S. effort to halt the proliferation of nuclear weapons.

2) **Author's statement:**

AB 65 will allow the state to capitalize on and maximize the economic, energy security, and environmental benefits of SMRs whilst simultaneously phasing out a reliance on electricity generated from natural gas facilities.

3) **Is it safer or more economical to manage the spent fuel from SMRs?** Although the author has not offered a specific rationale for exempting SMRs, presumably the smaller size and/or more modern design might minimize concerns with the cost and safety of managing the nuclear waste.

However, writing in opposition, the Alliance for Nuclear Responsibility points to a research article, *Nuclear waste from small modular reactors*, published last May in the Proceedings of the National Academy of Sciences. Quoting from the abstract:

Small modular reactors (SMRs; i.e., nuclear reactors that produce <300 MW<sub>elec</sub> each) have garnered attention because of claims of inherent safety features and reduced cost. However, remarkably few studies have analyzed the management and disposal of their nuclear waste streams. Here, we compare three distinct SMR designs to an 1,100-MW<sub>elec</sub> pressurized water reactor in terms of the energy-equivalent volume, (radio-)chemistry, decay heat, and fissile isotope composition of (notional) high-, intermediate-, and low-level waste streams. Results reveal that water-, molten salt-, and sodium-cooled SMR designs will increase the volume of nuclear waste in need of management and disposal by factors of 2 to 30. The excess waste volume is attributed to the use of neutron reflectors and/or of chemically reactive fuels and coolants in SMR designs. That said, volume is not the most important evaluation metric; rather, geologic repository performance is driven by the decay heat power and the (radio-)chemistry of spent nuclear fuel, for which SMRs provide no benefit. SMRs will not reduce the generation of geochemically mobile <sup>129</sup>I, <sup>99</sup>Tc, and <sup>79</sup>Se fission products, which are important dose contributors for most repository designs. In addition, SMR spent fuel will contain relatively high concentrations of fissile nuclides, which will demand novel approaches to evaluating criticality during storage and disposal. Since waste stream properties are

influenced by neutron leakage, a basic physical process that is enhanced in small reactor cores, SMRs will exacerbate the challenges of nuclear waste management and disposal.  
<https://www.pnas.org/doi/full/10.1073/pnas.2111833119>

4) **Prior legislation.**

AB 1035 (DeVore) exempted from the CEC power plant certification laws the first nuclear power plant to obtain an early site permit from the NRC. Failed in this Committee on April 20, 2009.

AB 1776 (DeVore) repealed the moratorium on the construction of new nuclear fission power plants in California and established new conditions on siting new nuclear plants related to seismic hazard, cooling water outflow and waste storage. Failed in this Committee on April 7, 2008.

AB 2788 (DeVore) exempted from the CEC power plant certification laws the first nuclear power plant to obtain an early site permit from the NRC. Failed in this Committee on April 7, 2008.

AB 719 (DeVore) repealed the moratorium on the construction of new nuclear fission power plants in California. Failed in this Committee on April 16, 2007.

5) **Double referral.** This bill is double-referred to the Assembly Utilities and Energy Committee.

**REGISTERED SUPPORT / OPPOSITION:**

**Support**

Generation Atomic  
FissionTransition

**Opposition**

Alliance for Nuclear Responsibility  
California Coastal Protection Network  
Committee to Bridge the Gap  
Environmental Working Group

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