

Rancho Seco Nuclear Power Plant: Maintenance/Disposal of Radioactive Waste and Used Nuclear Fuel

Issue

Are all reasonably necessary steps being taken regarding the storage and disposal of radioactive waste and used nuclear fuel produced at the Sacramento Municipal Utility District (SMUD) decommissioned Rancho Seco Nuclear Power Plant (Rancho Seco)?

Reason for Investigation

The Grand Jury initiated this investigation to determine 1) the status of radioactive waste and used nuclear fuel storage/disposal at Rancho Seco, 2) if adequate steps are being taken to protect the public from release of radioactive materials, and 3) if all appropriate steps are being taken to ensure that used nuclear fuel is being removed and stored in a safe and timely manner.

Method of Investigation

The Grand Jury reviewed documents (e.g., SMUD policies and procedures relating to the decommissioning of Rancho Seco) acquired from SMUD, and conducted internet research. It also toured Rancho Seco, received a thorough briefing, and the Grand Jury's questions were responded to by the power plant staff.

Background and Facts

SMUD planned and constructed the Rancho Seco 913 megawatt nuclear power plant in the 1960s and 1970s at a site near Herald, California, in southern Sacramento County. The plant was operated from 1975 to 1989. In June 1989, the residents of Sacramento County voted in an advisory vote to close Rancho Seco, and SMUD complied.

During Rancho Seco's 14-year operating period, materials became contaminated with radioactivity and 493 nuclear fuel rods became used. Radiological decommissioning of the facility requires that radioactivity be reduced to meet Nuclear Regulatory Commission (NRC) criteria for safety.

Radioactive waste is classified as "A", "B", "C" and "GTCC" (Greater Than Class "C"), depending upon the level of radioactivity it emits. The least potent is "A" waste, consisting of clothing, some soils and materials, and is shipped to a landfill site in Utah authorized to store low level nuclear waste. "B" and "C" category wastes are being stored in a building designed to NRC standards until an off-site facility acceptable to SMUD becomes available. They will then be removed and stored at

that facility. The building at Rancho Seco has a life expectancy of 30 years and must be re-evaluated by 2028. Some items were decontaminated and sold to local recyclers or sent to landfill. All of these items were extensively screened for radioactivity before release.

“GTCC” waste is more potent and must be handled with greater diligence than radioactive waste classified as “A”, “B” or “C”. It will be stored on-site in the same type of container as used fuel and under the same security. There is currently no national facility or location to store “GTCC” waste.

Dealing with the 493 used nuclear fuel rods is an additional concern. They are currently being stored on-site in specially constructed containers in a specially constructed aboveground structure. They are under constant surveillance and their security has been upgraded since “9/11” in compliance with NRC regulations. SMUD maintains that the federal Department of Energy (DOE) is responsible for removing, transporting and providing for the long-term storage of used nuclear fuel. However, the proposed disposal site, Yucca Mountain, Nevada, is not ready to accept used nuclear fuel, and may not be for some time, if ever. In the meantime, SMUD is responsible for storing the used nuclear fuel rods.

The storage site is inspected by NRC periodically. To SMUD’s credit, it is trying to store the rods in the most cost effective and safe manner under NRC regulation, while seeking reimbursement for that cost from DOE, and urging the federal government to find a permanent solution to the disposal problem.

SMUD’s decommissioning trust funds radioactive waste removal and disposal (“A”, “B”, “C” and “GTCC” waste types) through 2028. SMUD’s decommissioning trust fund does not fund nuclear fuel storage at the site after 2008. It appears that the used fuel rods are not going to be removed from Rancho Seco to a permanent storage facility by 2008, and probably not for some time after that date. SMUD’s operation and maintenance expense for the used rods is approximately \$4.5 million per year, calling into question how that expense will be covered. The nuclear fuel used at Rancho Seco was acquired with the understanding that DOE would remove the used nuclear fuel rods from the site for permanent storage. For that purpose, SMUD provided to DOE funds collected from the sale of energy generated at Rancho Seco. Now there is controversy between DOE and SMUD regarding which is responsible for funding the continued care of the used nuclear fuel until it is removed from the site. SMUD has obtained a lower court ruling that it is the responsibility of DOE, but DOE is expected to appeal.

The radiological decontamination of Rancho Seco is scheduled to be completed in two phases. Phase I, to be completed in 2008, will remove almost all radioactive contaminated material or store it on-site. Phase II, planned for completion by 2030 will result in the removal of any remaining radioactive contaminated waste and all used nuclear fuel. However, because the Yucca Mountain disposal site for used fuel may never be opened, and there is no other facility for storing used nuclear fuel off-site, an alternative plan for the removal and storage may be required.

SMUD is in the process of reducing the site radiation level at Rancho Seco to 25 mRem¹ per year, or less, for persons working at the site. This is less than the 35 mRem from one chest X-ray, or the

¹ mRem is a measure of radiation exposure and can be related to potential health defects.

average exposure to United States residents from all sources of 360 mRem per year.

It should be noted that the Rancho Seco staff appeared highly motivated, dedicated and competent in dealing with these considerable challenges. Further, lessons learned by the staff in developing decommissioning procedures, a pioneering process, have served as examples nationwide.

Findings and Recommendations

Finding 1. While expenses for dealing with waste types “A”, “B”, “C” and “GTCC” are fully funded through 2028, the storage of used nuclear fuel, costing about \$4.5 million per year, is not funded beyond 2008.

Recommendation 1. SMUD should identify funding sources for appropriately dealing with storage of used nuclear fuel through at least 2028.

Finding 2. It is not certain which entity (SMUD or DOE) is responsible for the cost of storing “GTCC” waste and used nuclear fuel rods until they can be removed to a permanent storage facility. SMUD contends, but DOE disagrees, that it is the responsibility of DOE.

Recommendation 2. In the event that SMUD may ultimately be held responsible for storage of the used nuclear fuel rods, SMUD should develop contingency plans with sufficient funding to meet that obligation.

Finding 3. The Yucca Mountain, Nevada, nuclear waste storage facility may never be opened.

Recommendation 3. SMUD should develop a plan that includes possible funding sources which will provide for the permanent storage of the Rancho Seco used nuclear fuel.

Response Requirements

Penal Code sections 933 and 933.05 require that specific responses to both the findings and recommendations contained in this report be submitted to the Presiding Judge of the Sacramento Superior Court by October 1, 2007, from:

- **Sacramento Municipal Utility District**