

Recommendation 309

Consider Nuclear Waste Management Plan for Interim Storage of Defense Waste in Yucca Mountain, and Temporary Storage of Used Nuclear Fuel at Generation Sites

Background

The 1982 Nuclear Waste Policy Act (NWPA) declared the need for a national repository that would safely accommodate the defense waste and spent nuclear fuel that represents a deadly safety, health, and environmental threat to America and Americans. The NWPA was amended in 1985 to designate Yucca Mountain as the most appropriate site for the repository. The estimated cost for developing Yucca Mountain was \$58 billion, to be completed in 2035. Over a period of nearly 30 years, more than \$10 billion was spent to study and test Yucca Mountain and finally declare it scientifically viable as a national long term geologic repository for U.S. radioactive waste. President George W. Bush and Energy Secretary Spencer Abraham signed the final impact document in 2008, permitting the license application to be submitted to the Nuclear Regulatory Commission (NRC). The application sought to construct and open a high-level nuclear waste repository at Yucca Mountain by 2017.

However, as a result of daunting technical and institutional blockades, decades went by, and when President Barak Obama took office there were still no early prospects of completion. The license application was withdrawn in 2010 by the Department of Energy with no scientific data to explain why.

GAO assessed the site from October 2010 to September 2011¹. GAO reports that the site is located in a remote part of Nevada's Mojave Desert and partially includes lands of two adjacent highly-secured national security sites (the Air Force's Nevada Test and Training Range and DOE's Nevada National Security Site). The area is semiarid and has little surface water, with around six inches of possible rain each year. The groundwater beneath the site is several thousand feet below the surface in most locations. The mountain is composed of strong 6,000 feet thick volcanic rock which erupted between 14 million and 16 million years ago. The rock has very low permeability. According to the geologic record, the area has low levels of seismic activity.

The interior of the mountain was to be converted into a maze of tunnels which would entomb tens of thousands of glass-log canisters of high-level radioactive defense and commercial energy waste, along with other materials. Construction in the mountain over the past 30 some years has resulted in a 5-mile long u-shaped tunnel with both north and

¹The site assessment did not include an inspection of the tunnels because, following the President's proposal to eliminate federal funding for the Yucca Mountain Project, DOE terminated activities there in 2010. Steps to close the site included closing access to the tunnels and turning off the utilities, including electrical, water, and telecommunications infrastructure. Office equipment, computers and other equipment were transferred to other locations. As a result of the closure actions, DOE determined that reopening the tunnel for a day (i.e. to allow a GAO or other investigation) would cost some \$20,000-\$50,000.

south entrances as well as a 2-mile tunnel branching off of the 5-mile tunnel. Both are 25 feet in diameter and have rail tracks, lighting systems, ventilation systems, and computer networking lines. The rock surrounding the tunnels is so solid that the tunnels are self-supporting, unlike most tunnels which require additional supports such as post and lentsils or pillars. DOE estimates that construction of the main Yucca Mountain tunnel cost about \$400 million between fiscal years 1994 and 1997. It is, without a doubt, the most studied site in the world and certainly could be the most secured site on the planet.

Discussion

In May of 2012, the DOE Site Specific Advisory Board for the Savannah River Site (CAB) adopted a recommendation (#286) which advised DOE to follow the BRC's recommendation to establish one or more interim storage sites for receipt of U.S. high-level nuclear wastes, designate Yucca Mountain as a potential interim storage site, request funding for completion of that site as an interim storage site, and develop an action plan for opening Yucca Mountain to receive interim storage radioactive waste.

It can be argued that taking Yucca Mountain off the table as a permanent repository was practical policy. The site's design capacity was to be some 77,000 tons, with an additional future site to follow in a different geographical location. With an already existing 2012 backlog of 75,000 tons in spent nuclear fuel, and with an annual growth rate of more than 2,000 tons, one permanent repository was never the solution to the problem. There would also be inadequate room in Yucca Mountain for the millions of gallons and thousands of tons of legacy waste accumulated at the national laboratories. If nuclear waste management policy and planning depends on such permanent deep geologic repositories, numerous repositories will be required as the nation's inventory of spent nuclear fuel grows, especially if the projected "Nuclear Renaissance" comes to pass. Additionally, such repositories would only change the location of deadly defense waste and used nuclear fuel to change. The volume would not change until large expanses of time have passed, while the risk of the material remained high for the foreseeable future.

A better, more practical, policy should be a plan which leaves the nation's commercial used nuclear fuel where it is generated until separation technologies are developed that can destroy the bulk of it by reducing its volume, radioactivity, and half-life. Compensation should be provided to utility companies for accommodating the used nuclear fuel. Separation technologies are of crucial importance to the goal of significantly reducing the volume of high-level nuclear waste and used nuclear fuel, along with its long-term health risks to mankind.

In addition to compensating utility plants for the storage costs of used nuclear fuel, and the development of separation technologies, Yucca Mountain, the most proven candidate for high-level nuclear waste storage, should be prepared as an Interim Site for receipt of all defense waste requiring secure storage. Moving defense waste to Yucca Mountain will allow consolidation of the deadly material at one verified secure site and, simultaneously, promote the cleanup of polluted DOE nuclear complexes. Consolidation

would also allow some DOE sites to be decommissioned and closed following cleanup. Leaving used nuclear fuel at the generation sites and storing defense waste in Yucca Mountain while separation technologies are developed to substantially reduce the waste's volume, radioactivity, and half life will save significant taxpayer dollars in site closures, transportation costs, and court awards for failure to take possession of used nuclear fuel. The court awards have now cost several billion dollars. In addition to saving the expenditure of future tax dollars on nuclear waste management, the suggested plan would also recoup the tax dollars already spent on Yucca Mountain's development. If that site is not utilized, and there is no scientific data to indicate that it should not be, \$10 billion of tax dollars will have been wasted.

Recommendations

The Savannah River Site Citizens Advisory Board recommends that DOE:

1. Develop a national nuclear waste management plan which considers Yucca Mountain as an Interim Site.
2. Develop a plan to complete, at the earliest possible date, the development of Yucca Mountain as an engineered environment to be temporarily used as an Interim Site for the storage of high-level defense waste.
3. Based on viability of Yucca Mountain as an interim repository site, request congressional funding for Yucca Mountain's development as an Interim Site in accordance with the guidance of the BRC and DOE 2013 Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste.