

Siting New Facilities for Storage and Disposal Of Spent Nuclear Fuel and High-Level Radioactive Wastes

DOE is designing a phased, adaptive, consent-based approach to siting new nuclear waste facilities as part of an integrated waste management system, for the safe management of spent fuel and high-level radioactive wastes.

Summary: The use of nuclear technology for commercial electricity production or for national defense activities results in the generation of radioactive wastes. Among the most radioactive of these wastes are used (or “spent”) nuclear fuel from nuclear power plants, naval nuclear vessels, and nuclear production or test reactors; and also the high-level radioactive wastes (HLW) left over from the processing of nuclear materials for nuclear weapons production.

Under the Nuclear Waste Policy Act (NWPA), DOE is responsible for providing for the safe and permanent disposal of spent nuclear fuel (SNF) and HLW. DOE has agreements with the states of Idaho, South Carolina, and Washington regarding the cleanup of HLW from former defense sites. And per the NWPA, DOE was to begin accepting commercial SNF and removing it from generator sites by 1998.

Following the 1982 passage of the NWPA, DOE studied several possible sites for a disposal facility (or “repository”) for SNF and HLW, until Congress passed the 1987 Amendments to NWPA, directing DOE to evaluate only Yucca Mountain¹ in Nevada. In 2009, DOE determined that siting a geologic repository at Yucca Mountain was an unworkable solution.

DOE is now starting to implement a new, phased, and adaptive integrated strategy for management and disposal of SNF and HLW. This strategy includes use of a consent-based process to site new facilities for storage and disposal of SNF and HLW. A long-term strategy for managing SNF and HLW is needed for many reasons: to safeguard public health and the environment; to mitigate security and proliferation risks; to protect taxpayers from ballooning financial liability as nuclear utilities seek compensation for the federal government’s failure to meet its waste acceptance obligations; and—not least—to avoid burdening future generations with nuclear waste they had no part in creating.

Issue

DOE is designing a consent-based siting process to establish an integrated waste management system (IWMS) to transport, store, and dispose of SNF and HLW. DOE has solicited input from communities, tribal governments, and states across the country to develop a process to site future nuclear consolidated interim storage facilities and geologic repositories. In practical terms, this means communities, states, and tribes can begin a dialogue with DOE to see if they would like to become a willing and informed host of a future nuclear management facility. This would likely be done in expectation of yet to be negotiated benefits and the economic activity that would result from the siting, construction, and operation of such a facility in their jurisdictions. The Department is doing what it can within existing authority to advance the consent-based siting initiative as Congress considers this together with other options for nuclear waste storage and

¹ The Office of Legacy Management (LM) assumed responsibility for the preservation of physical records and more than 20 information systems containing more than 96 terabytes of data that document the science and information accumulated during the active life of the Yucca Mountain Project.

disposal including the potential role of private spent nuclear fuel storage initiatives, Yucca Mountain, and a defense repository for high-level radioactive waste.

Status

In fiscal year (FY) 2016, the Department launched an effort to solicit input from the public and interested parties on what elements to consider when designing a fair and effective consent-based siting process. DOE issued an Invitation for Public Comment in December 2015 and held a series of public meetings across the country to solicit feedback from communities, states, Tribes, and other interested stakeholders on elements to consider in the design of a consent-based siting process. Comments received throughout the Invitation for Public Comment and public meetings were summarized in a draft report “Designing a Consent-Based Siting Process: Summary of Public Input” along with a preview of the next steps for consent-based siting. By the end of calendar year 2016, the Department will issue a number of documents for public comment and discussion including a draft consent-based siting process. DOE has requested FY 2017 appropriations from Congress for a grants program to help communities, states, and tribes engage in the consent-based siting process. Meeting materials and transcripts can be found at [energy.gov/consent based siting](http://energy.gov/consent-based-siting)

Milestones

- Issue Request for Information for Private Initiatives, Date: October 2016
- Issue Defense Waste Repository Plan for public comment, November 2016.
- Issue Final Draft of “Designing a Consent-Based Siting Process: Summary of Public Input” December 2016.
- Issue Draft Consent-based Siting Process, December 2016.
- Issue Funding Opportunity Announcement (FOA) to enable community involvement in consent-based siting, date TBD (pending Congressional support/appropriations).
- Conduct citizen forums to seek public perspectives on nuclear waste and consent-based siting, Winter/Spring 2017.

Major Decisions/Events

The next phase of this effort, pending Congressional approval, would entail the award of grants to communities, states, and tribal governments, and potentially others, for them to learn more about what it would take to possibly host a future nuclear waste facility and what benefits could result from their playing a role in solving this national challenge. Understanding that the Department is seeking a willing and informed host, the Department would like to place resources in the hands of communities for them investigate the topic further and to see if they would like to consider hosting a future nuclear waste management facility.

Background

In 2009, the Administration concluded that the Yucca Mountain project was unworkable, due to the lack of support from the host state Nevada, and in 2010 formed the Blue Ribbon Commission on America’s Nuclear Future to recommend a new strategy for nuclear waste management. The 2012 report of the Blue Ribbon Commission recommended a new approach to siting that differs in fundamental respects from the prescribed, “top-down” approach that has characterized the

U.S. repository program since the NWPA Amendments Act of 1987 limited DOE's consideration of potential repository sites to a single location, at Yucca Mountain in Nevada. Based on a review of past experience with siting nuclear waste facilities in the United States and overseas, the Blue Ribbon Commission concluded that success would be more likely with an approach to siting that was consent-based – in the sense that affected communities have an opportunity to decide whether to accept facility siting decisions.

In 2013, the Administration released its Strategy for the Management and Disposal of Used Nuclear Fuel and High-Level Radioactive Waste. This Strategy envisions an integrated waste management system consisting of a set of nuclear waste facilities, each serving a specific purpose, to address the challenges of safely managing both SNF and HLW. These nuclear waste facilities could include:

- A pilot interim storage facility with limited capacity capable of accepting SNF and HLW and initially focused on serving shutdown reactor sites;
- A larger, consolidated interim storage facility, potentially co-located with the pilot facility and/or with a geologic repository, that provides needed flexibility in the waste management system and allows for important near-term progress in implementing the federal commitment;
- Deep borehole disposal, which could be an option for disposal of smaller and more compact waste forms currently stored at Department of Energy sites;
- A permanent geologic repository for the disposal of defense HLW and, potentially, some DOE-managed SNF, which would be generally less radioactive, cooler, and easier to handle, enabling a simpler design and earlier availability; and
- A permanent geologic repository for the disposal of commercial SNF.

DOE is working to design a consent-based siting process for nuclear waste management facilities as part of an IWMS.

- Nuclear technology has been used in the United States for national defense, research and development, and electric power generation. These activities produced a large quantity of SNF and HLW.
- The largest inventory of SNF comes from commercial electricity generation: approximately 75,000 metric tons of uranium (MTU) at the end of 2015 with potential growth to 140,000 MTU with the current reactor fleet. Nearly all the existing commercial SNF is being stored at the reactor sites where it was generated. Of the 74 commercial reactor sites, 13 sites no longer have an operating reactor.
- DOE also manages roughly 90 million gallons of liquids, sludges, and solids, all being managed as HLW, most of which were generated for defense related nuclear activities. These wastes are mainly stored at DOE's Hanford, Savannah River, and Idaho sites.
- SNF and HLW pose a disposal challenge because these materials remain radioactive and therefore require isolation from the public for long periods of time. The expert consensus is that disposal in a deep geological repository offers the best practical solution for achieving long-term isolation. Many locations around the country offer potentially suitable conditions for a disposal repository. However, the challenge to date has been

siting facilities. State (and sometimes local) opposition has thus far stymied all historical efforts to move forward with either a repository or consolidated storage site.

- The Nuclear Waste Policy Act, originally enacted in 1982, was amended in 1987 to limit the continued evaluations of three sites down to one (the Yucca Mountain site in Nevada). Nevada viewed this as an unfair decision that took advantage of its small electorate, and this view fueled a determined effort to fight the project. The failure to win public support led to the 2009 conclusion that Yucca Mountain is not a workable solution to the nation's nuclear waste challenges.
- Building on the recommendations of the Blue Ribbon Commission for America's Nuclear Future and the Administration's Strategy (2013), DOE is working to design and implement a phased, adaptive, consent-based approach to siting nuclear waste management facilities (subject to appropriate authorizations from Congress).

Congress has supported the Administration's position on Yucca Mountain since 2011 and has not appropriated any new funding to continue the project. However, there are members of Congress who believe the Yucca Mountain NRC repository licensing process should be resumed and, at a minimum, completed to demonstrate that a disposal facility could successfully demonstrate its safety and obtain an authorization from NRC to begin construction (even if it is never constructed).