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The Yucca Mountain nuclear waste site has always been a political football. Trump is the latest president to fumble

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The Yucca Mountain nuclear waste site has always been a political football. Trump is the latest president to fumble

By Allison Macfarlane, February 21, 2020

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The Energy Department dug this 25-foot-diameter tunnel under Yucca Mountain to explore its potential as a nuclear waste repository. Credit: US Department of Energy

As with much policy-setting in the Trump administration, a single tweet from the president on February 6 appeared to reverse a previous stance. The message about Yucca Mountain, the nation's proposed geologic repository for spent nuclear fuel and other high-level radioactive waste, set the media alight with speculation about new actions in US nuclear waste policy. But has anything changed, really?



Donald J. Trump
@realDonaldTrump

Nevada, I hear you on Yucca Mountain and my Administration will RESPECT you! Congress and previous Administrations have long failed to find lasting solutions – my Administration is

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107K 2:11 PM - Feb 6, 2020

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The new policy, if it is such a thing, is a little wobbly. It's unclear whether the administration is or is not supporting Yucca Mountain as a waste repository. The Energy Department's Undersecretary for Nuclear Energy and nominee for Deputy Secretary, Mark Menezes, **stated** six days later in a House Energy and Commerce subcommittee hearing that "what we're trying to do is to put together a process that will give us a path to permanent storage at Yucca." A White House official tried to square the circle of conflicting messages, **stating**: "There is zero daylight between the President and Undersecretary Menezes on the issue."

At the same time, Trump's fiscal year 2021 budget did not include funds for Yucca Mountain, unlike in previous years. In point of fact, though, Congress has not appropriated funding for Yucca Mountain in the past decade. The proposed repository site made it about halfway through the licensing process at the Nuclear Regulatory Commission and halted when the Obama administration's Energy Department tried to pull the license application. The state of Nevada still strongly opposes Yucca Mountain and hasn't changed its tune since passage of the Nuclear Waste Policy Act Amendments in 1987 (colloquially known in Nevada as the Screw Nevada Bill), which designated Yucca Mountain as the proposed repository site.

Trump's tweet acknowledges the fierce and long-standing opposition to Yucca Mountain in a swing state he lost by a slim margin in 2016. The Democratic presidential candidates are **unanimously opposed** to storing nuclear waste at Yucca Mountain.

A permanent impasse. Yucca Mountain has spent much of its existence as a **political football**. The original Nuclear Waste Policy Act of 1982 required detailed characterization of three potential repository sites for the disposal of the nation's spent commercial nuclear fuel and high-level radioactive waste from the nuclear weapons complex. By 1986 it was clear that work on three sites would be very costly, and Congress balked at the price tag. Political wrangling ensued, and it was no accident that among the three states under consideration—Nevada, Texas, and Washington—the one with the most-junior congressional delegation, including a newly elected Senator Harry Reid, was selected as the only site to be characterized by the Energy Department for

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A mining machine excavates alcoves and niches for exploratory scientific testing at Yucca Mountain. Credit: US Department of Energy

Thereafter, appropriation of funds for work on Yucca Mountain was continuously subject to political whims in Congress. Senator Reid, for instance, repeatedly blocked funding for Yucca Mountain after the House had approved it. And it's an old adage among US nuclear waste experts that nothing ever happens with nuclear waste during an election year.

At the moment, no one involved in the process has an incentive to make progress. An extremely partisan House and Senate are at a permanent impasse on an issue that bears little on re-election chances (except in Nevada). The nuclear industry has found they can build new reactors—the two Westinghouse AP1000 units under construction in Georgia—without a solution to their spent fuel problem. The Energy Department, originally tasked with solving the problem, has no legal authority (or appropriations) to move forward. The Nuclear Regulatory Commission, which passed a Continued Storage Rule in 2014, vacated its ability to force a solution. And many anti-nuclear interest groups that oppose waste transport and repositories have called for “bordered on site

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Pressure to do something is building, though, as more reactors shut down around the country. Since 2013, nine reactors have permanently closed, and by 2025 at least six more are slated to join them. These 15 will join the 12 reactors already shut down, for a total of 27 around the country. Eleven of them have been or are being completely decommissioned, so all that will remain on site will be the spent fuel, awaiting a solution. Leaving spent fuel in dry storage in perpetuity is *not* a solution: The casks won't last forever and will need to be changed out periodically (experts do not yet know how long they will last). Can the American public ensure that a benevolent government will exist 50, 100, or 1,000 years from now to carry out this task? We cannot.

“Solutions” that aren’t. Both President Trump and Undersecretary Menezes referenced “innovative approaches” to dealing with spent nuclear fuel. Are there actual alternatives to a repository at Yucca Mountain? There might be alternatives to the Yucca Mountain site, but there is no escaping the need for a deep geologic repository to dispose of spent nuclear fuel. Numerous studies have come to this conclusion, including the [US National Research Council](#), the [Blue Ribbon Commission on America’s Nuclear Future](#) established by the Obama administration to consider alternative strategies of nuclear waste disposal (I served on the commission), and [a recent report](#) out of Stanford and George Washington Universities (I was on the steering committee for the report).

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Specialized trucks vibrate the ground to test for seismic activity at Yucca Mountain. Credit: US Department of Energy

Ideas such as “advanced” reactors that use waste as fuel, deep borehole disposal, and the perpetually-proposed reprocessing of spent nuclear fuel have all been presented as solutions to our current dilemma. None are. **Studies that my colleagues and I have done**, and the National Research Council **consensus report**, show that all reactors and reprocessing schemes produce wastes that are highly active and long-lived and therefore still require disposal.

The Trump administration **appears interested** in reviving reprocessing as a “solution” for spent nuclear fuel. It’s not a solution, simply a costly management strategy. The few countries that still reprocess spent fuel, such as France, plan to use a geologic repository for the high-level waste produced. France, in fact, has already selected a site for its repository. Even if somehow, as some claim, reprocessing reduced wastes to those dominated by 30-year half-lives, a repository would still be required as, again, institutions cannot be guaranteed to last 300 years, the amount of time needed for the waste to fully decay. With impending climate-change effects such as significant sea level rise by 2100, who knows what the world will look like in 300 years, both physically

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Deep boreholes, though perhaps appropriate for some radioactive wastes, would be hard-pressed to handle spent fuel due in part to the narrow borehole diameter, limited to thin-walled canisters that can only hold one spent fuel assembly each. The thin walls and significantly more numerous canisters would increase worker doses and reduce the canisters' strength to resist the overlying rock burden. The depth of the boreholes—up to 5 kilometers—and the limited ability to access them without disturbing the natural environment would result in a limited capability to adequately characterize the geologic environment at depth. Even more challenging would be to ensure that radioactivity **cannot escape** up the backfilled borehole.

Political innovations needed. All countries with commercial nuclear energy programs agree that geologic repositories are the only solution to the problem of spent nuclear fuel and high-level radioactive waste. The problems facing repositories are not primarily technical (though these exist), but political. Political innovations are truly needed to **successfully site** these facilities.

Such innovations already exist: Finland is currently constructing its deep geologic repository, and Sweden isn't far behind. Switzerland, France, and Canada have all made significant progress in the last few years. The United States, in fact, is the only country with an operating deep geologic repository—the Waste Isolation Pilot Project that houses transuranic waste from the nuclear weapons complex in southeastern New Mexico—proving that it can be done here.

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The Waste Isolation Pilot Plant received its 12,500th shipment of transuranic waste last year.

There are important lessons to learn from the mistakes and successes of these other programs: The host community must accept the site by a large majority; the host community must be compensated; it must be allowed to veto the site, up to a predefined point in the process; the process works best when the host community is allowed to participate in site development and conduct its own independent research; the nuclear waste management organization and the nuclear regulator must be trusted institutions; and the waste management organization must have the ability to manage its own budget and plan for the long term.

None of this is rocket science, and these lessons have been spelled out numerous times in the United States. The real question is whether anyone with political power is listening.

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charles fitzpatrick

Ms. Macfarlane.....I would disagree with your estimate regarding the licensing proceeding....it was suspended before discovery even began.....you say 50%; I'd suggest 25% max.

-2

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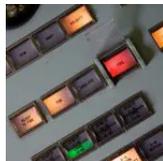
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