

On the Road to Nowhere

States confront the challenges of what do with the growing amounts of nuclear waste.

BY SCOTT HENDRICK AND
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One thousand feet under a rocky ridge in southern Nevada lies a five-mile-long, 25-foot-wide U-shaped tunnel. Known as Yucca Mountain, the passageway was supposed to house the bulk of the nation's used nuclear fuel and hottest radioactive military waste.

Instead, it sits empty—a glaring reminder of how difficult it is to find a permanent resting place for some of the world's most dangerous materials.

Meanwhile, utilities (and indirectly their ratepayers) continue to pump money—\$27 billion since 1982—into a fund that has remained untouched since plans for Yucca Mountain were shelved in 2010.

And the waste piles up. More than 68,000 metric tons of spent nuclear fuel have been produced by the nuclear energy industry, the bulk of which sits at operating or shuttered nuclear power plants in 35 states. The military has generated about 13,000 metric tons of high-level waste. And an additional 2,000 metric tons are added each year.

Local Cooperation Crucial

The story of Yucca Mountain is a cautionary tale about what can happen when the federal government imposes its will on a state without its cooperation or consent. Despite objections by many in Nevada, Congress officially designated it a future nuclear waste repository in 1987 and began

to study and develop it—at a cost of more than \$15 billion.

Nevada claimed its sovereign rights were being violated and launched a series of legal attacks on the project, challenging the

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—REPRESENTATIVE JOHN RAGAN (R),
TENNESSEE

Scott Hendrick and Claire Lewis track radioactive waste management issues for NCSL.



NCSL's Working Group

NCSL's Nuclear Legislative Working Group consists of about 75 state legislators from around the country who discuss issues surrounding the cleanup of cold-war weapons production areas, the shipment of radioactive waste through the states, and nuclear energy. For more information on this bipartisan working group and other nuclear waste concerns, go to www.ncsl.org/magazine.

federal government's environmental, public health and safety standards.

But it was President Obama's decision to withdraw the site's operating license application—with support from U.S. Senate Majority Leader Harry Reid of Nevada—that ultimately derailed the project. Although the decision is being challenged in court, the prospects of Yucca Mountain ever receiving waste at this point are dim.

“What the demise of the Yucca Mountain project tells us is that the federal government needs to work with states and local communities during the entire process of siting, building and



High-Level Nuclear Waste 101

What is high-level radioactive waste?

Used fuel from nuclear power plants and certain military waste, such as nuclear fuel from submarines and byproducts from nuclear weapons research and production.

How much waste is out there?

More than 68,000 metric tons of used fuel from nuclear power plants and about 13,000 metric tons of military waste. About 2,000 metric tons are produced every year.

Is this waste dangerous?

It is very radioactive, and will remain so for thousands of years. Direct exposure can cause cancer and even death. When properly stored and managed, however, most believe it does not pose a risk to human health or the environment.

Where is all this waste?

In storage in 35 states. Most of the military's high-level radioactive waste is stored at the Hanford facility in Washington, the Idaho National Laboratory site, the Savannah River site near the border of South Carolina and Georgia, and the West Valley site near Buffalo, N.Y. In 31 states, commercial waste is stored at the operating nuclear power facility producing it; in four states, the waste remains onsite at closed power plants. The military waste could theoretically stay at the four major sites permanently. The safest place to store waste, however, is underground in a geologic repository.

How is the waste stored?

First in pools of water at least 20 feet deep. It cools there for five to 10 years. The water shields workers and the surrounding environment from the radiation. After the initial cooling period, the fuel can either stay in the pools or be moved to dry casks—leak-proof steel and concrete cylinders. The U.S. Nuclear Regulatory Commission has determined that the waste can be safely stored this way for at least 30 years after a plant stops operating.

How do other countries store high-level waste?

In wet pools and dry casks at nuclear power plants. No country has yet to open a permanent underground storage place, although significant progress toward opening sites is being made in several countries. Finland and Sweden are furthest along, having selected sites with local support and pursued approval to begin construction.

operating a nuclear waste repository," says Tennessee Representative John Ragan (R).

That's also the conclusion of The Blue Ribbon Commission on America's Nuclear Future, charged by President Obama to find a new way to manage nuclear waste. In 2012, the commission made eight major recommendations to Congress and federal agencies. The first was that the federal government establish a consent-based approach to finding places to store waste.



*Representative
John Ragan (R)
Tennessee*

Perception Problem

Finding communities that will take the nuclear waste is not the most difficult part of the problem. The jobs, federal money and other economic benefits that follow a nuclear waste site make it attractive to many.

The most significant hurdle can be convincing others in the state that the benefits of accepting nuclear waste outweigh the potential risks. "Finding a consenting community is merely a first step," wrote William Alley, the former chief of the Yucca Mountain waste storage site, in a recent opinion piece in *New Scientist*. "The harder part is getting everyone else to sign on."

In addition to Nye County, Nev., where local officials were strongly in favor of the Yucca Mountain project, Oak Ridge, Tenn., and the Skull Valley Band of the Goshute Nation in Utah, also saw local efforts to open nuclear waste sites scuttled by statewide opposition.

But not all attempts to site nuclear waste disposal facilities have failed. The Waste Isolation Pilot Plant (WIPP) outside Carlsbad, N.M., has stored protective gear, tools and other long-lived radioactive debris (known as transuranic or TRU waste) from the military's nuclear weapons research and production facilities since 1999. The waste is kept 2,150 feet below ground

America's High-Level Waste By the Numbers

81,000 metric tons
Amount of waste with nowhere to go

2,000 metric tons
Amount of waste produced each year

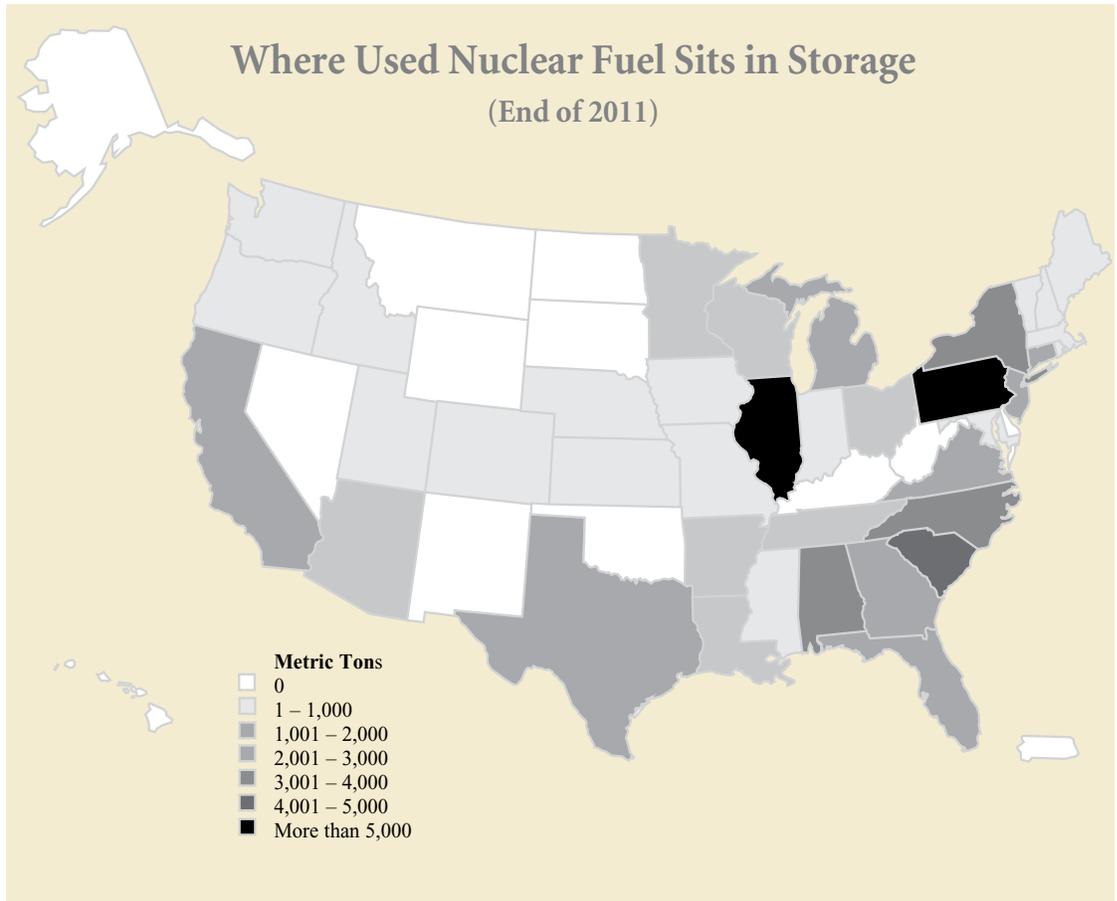
104
Number of nuclear power plants in the country

20%
Amount of our electricity needs produced by nuclear power

\$27 billion
Amount sitting in the Nuclear Waste Fund

19
Number of new reactors in the planning stage in 15 states

Source: Nuclear Energy Institute, U.S. Nuclear Regulatory Commission, U.S. Department of Energy



in the Salado Formation, a giant salt deposit that stretches from northern Mexico through southeastern New Mexico and into west Texas. Salt beds keep the waste dry and seal it away from groundwater that could eventually move the waste to the surface.

When local officials first suggested the idea in the 1970s, it was met with skepticism by many. Some didn't want their highways used for shipments of other states' radioactive waste. Others raised concerns about the design of the transportation casks and the environmental and public health standards that would govern the site. New Mexico twice filed lawsuits to stop development and agreed to the site only after Congress passed a law in 1992 that gave the state authority to regulate the wastes and permit the site.

That law also gave New Mexico money for highway safety and emergency preparedness, and required the U.S. Department of Energy to prepare plans for eventually extracting the waste and shutting down the site. It also guaranteed that highly radioactive nuclear fuel and military waste would not be stored at the site, eliminating the possibility of using WIPP to fulfill the role of Yucca Mountain without changes to federal law.

Nonetheless, WIPP may provide a model for how local, state and federal officials can work together to open a permanent repository for high-level radioactive waste.

A Fresh Start

With the appropriate authorization from Congress, the U.S. Department of Energy plans to kick-start a new process to locate nuclear waste sites that incorporates the Blue Ribbon Commission's recommendations and includes all affected parties. The department's goal: to open temporary storage sites by 2021 and 2025 to house waste until a permanent repository is opened by 2048.

In the meantime, states with nowhere to store their radioactive waste are losing patience with the federal government. It was supposed to begin collecting used nuclear fuel by 1998, and continues to collect fees from nuclear utilities and their customers for the Nuclear Waste Fund.

"Continuing to pay millions of dollars each year to the Nuclear Waste Fund is beyond frustrating," says Minnesota Representative Joe Atkins (D). "The Nuclear Waste Fund is like a garbage service we hired 30 years ago, which has never once shown up to collect the trash, yet we keep paying for it. It makes no sense."



Representative Joe Atkins (D) Minnesota

The Pressure Mounts

Representative Atkins and lawmakers in five other states have proposed legislation over the years to stop



Recommendations of the Blue Ribbon Commission

1. Use a consent-based approach to siting future nuclear waste-management facilities.
2. Dedicate a new organization solely to implementing the waste-management program with the authority and resources to succeed.
3. Allow funds nuclear utility ratepayers have been paying to be used for nuclear waste management without having to compete with other federal spending priorities.
4. Develop one or more permanent geologic repositories and temporary consolidated storage facilities promptly.
5. Prepare for eventually transporting large-scale spent nuclear fuel and high-level waste to these facilities when they become available.
6. Support research and innovation in nuclear energy technology.
7. Offer appropriate training to prepare workers.
8. Provide leadership in international efforts to address safety, waste management, proliferation and security concerns.

announced it will not issue final approval of any new plants until it determines the safety and environmental implications of storing fuel at nuclear power plants for more than the 30 years originally intended after a plant closes.

The “Waste Confidence Decision,” which will evaluate on-site fuel storage for an additional 30 years, is expected sometime in 2014 and is part of the required environmental analysis for all new reactor licenses and license renewals. If the decision is that fuel can be stored safely at plants for 60 years after they close, the Nuclear Regulatory Commission will continue to issue new reactor licenses and license renewals. But if the

final decision is that safety could be compromised after 30 years, further environmental analysis will have to be done. This could have a chilling effect on plans to open new plants or continue operating existing plants as their licenses come up for renewal.

Much is left to be done to lay the foundation for a successful waste management system. Congress needs to authorize new interim storage and permanent disposal sites and consider how they should be managed and paid for. And a process for locating these facilities needs to incorporate the interests and concerns of all parties, from city hall to the statehouse.

“State policymakers are ready and willing to play a meaningful role in creating a timely, cost-effective solution to this important public policy challenge,” says Maryland Delegate Sally Jameson (D), chair of NCSL’s Nuclear Legislative Working Group. “We can help to break the logjam on this issue.”

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—REPRESENTATIVE JOE ATKINS (D)
MINNESOTA

or reduce payments to the fund to force some federal action. Although none have yet passed, until the federal government upholds its side of the bargain, radioactive waste will continue piling up at nuclear facilities around the country.

State legislatures are working to ensure the continued safety of the nuclear power industry and its stockpiles of used fuel. State agencies routinely check for the presence of radioactive materials in areas surrounding the power plants. States can also conduct independent safety inspections of power plants to ensure operations comply with state laws.

Many states also have established accounts funded by power plant operators or the state to pay for emergency response and cleanup efforts if an accident occurs at a nuclear power plant.

In addition, faced with the uncertainty of what will happen with the growing amount of high-level waste, some states are reluctant to include nuclear power in future energy planning decisions. Thirteen state legislatures have passed laws prohibiting construction of new nuclear facilities until a permanent disposal site is opened.

Meanwhile, the U.S. Nuclear Regulatory Commission has



Delegate
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