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A Safer Nuclear Crypt



Peter Wynn Thompson for The New York Times

Safeguarding Spent Nuclear Fuel: The Times's Matthew L. Wald looks at options for safely storing spent nuclear fuel as the American nuclear industry faces new scrutiny following the nuclear incident in Japan.

By **MATTHEW L. WALD**
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MARSEILLES, Ill. — Watching intently as a huge white steel container surfaced from a 42-foot-deep canal, workers set upon it with long-handled tools, like sailors wrestling a flailing whale to the deck of a ship.

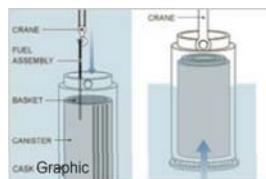
Yet this catch was far more menacing: 57,000 pounds of spent nuclear fuel at the [LaSalle nuclear plant here](#), stored for decades in a pool and, if unshielded, powerful enough to deliver a lethal dose of radiation within seconds.

The fuel had just been moved into a capsule the size of a small silo, called a dry cask. Welded shut after it came out of the water, the cask was pumped full of inert gas, placed in an outer cask and moved outdoors to a concrete pad where it will sit until a disposal site is found. Spent fuel must be isolated from the environment for hundreds of thousands of years before it loses its potency.

The [nuclear calamity](#) at Japan's Fukushima Daiichi plant has refocused attention on the vulnerability of [spent fuel pools](#) at the 104 operating American nuclear plants.

The pools are generally far more packed than the damaged ones at Fukushima. Some scientists argue that the crowding

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Peter Wynn Thompson for The New York Times

A spent fuel pool at a nuclear plant in LaSalle, Ill. Some scientists argue that risks are rising as fuel rods accumulate and the pools become more crowded.

raises the risk of a fire and makes the pools a tempting target for terrorists.

Several members of Congress are calling for the fuel to be moved from the pools into dry casks at a faster clip, noting that the casks are thought to be capable of withstanding an earthquake or a plane crash, they have no moving parts and they require no electricity.

“We should not wait for an American meltdown to beef up American nuclear safety measures,” [Representative Edward J. Markey](#) of Massachusetts, who advocates greater reliance on casks, said after the accident in March in Japan. “We must heed the lessons to be learned from the nuclear meltdown in Japan and ensure nuclear safety here.”

But transferring the fuel to dry casks involves risks of its own, some industry experts say. “It’s a very complex discussion,” said [Neil Wilmshurst](#), a nuclear power expert and a vice president of the Electric Power Research Institute, a nonprofit utility consortium. “Every time you move spent fuel, there’s always a risk of human error. How much of this do you want to do if you don’t need to do it?”

The discussion is unfolding amid a far broader and more divisive debate over nuclear waste disposal. A half-century after the American nuclear industry was born, the nation still lacks a dedicated repository for such waste because of maneuvering driven by not-in-my-backyard politics.

In 1987 Congress designated [Yucca Mountain](#), a desolate volcanic ridge in the Nevada desert, as a national disposal site, ruling out sites in Texas and Washington State. But the political landscape shifted, and the Obama administration canceled the project in 2009 under pressure from Senator Harry Reid of Nevada, leader of the Senate’s Democratic majority.

Then came the earthquake and tsunami at Fukushima, which cut off power to four reactors and caused three cores to melt. The melting fuel in the reactors released hydrogen gas that then exploded, throwing debris into the fuel pools, destroying a barrier that had prevented the release of radioactive materials to the outdoors and leaving the pools exposed to the rain.

Suddenly, the Nuclear Regulatory Commission was under pressure to explain whether crowded American pools faced parallel risks.

[Gregory B. Jaczko](#), chairman of the commission and a former aide to Senator Reid, contends that both fuel pools and dry cask storage are relatively safe, with any differences being fractional. “It’s like the difference between buying one ticket in the Powerball lottery and 10 tickets,” he said in an interview, referring to the odds that something will go wrong.

But Robert Alvarez, a former senior adviser to the secretary of energy and expert on nuclear power, points out that unlike the fuel pools, dry casks survived the tsunami at Fukushima unscathed. “They don’t get much attention because they didn’t fail,” he said.

In addition to the United States and Japan, plenty of other countries make extensive use of casks, usually storing them at reactor sites. Germany has gone a step further, placing them in installations designed to protect the casks from airplane crashes.

After Japan’s disaster, the Tennessee Valley Authority said it would study the possibility of moving more fuel to casks, but so far other American operators have not followed suit. Moving all of the nation’s fuel once it has cooled in the pools for at least five years could cost \$7 billion, Mr. Alvarez said.

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