

Published: Jan 15, 2006 12:30 AM
Modified: Jan 15, 2006 02:50 AM

What about reprocessing?

JOHN MURAWSKI, Staff Writer

Why not just recycle nuclear waste and reuse it forever like scrap metal?

If only it were that simple. Only in science fiction would reprocessing eliminate nuclear waste.

Reprocessing extracts viable nuclear fuel from the waste -- but it doesn't reduce the amount of waste. By removing usable fuel, reprocessing leaves about 25 percent less material for disposal. But eventually, the reprocessed fuel is turned into radioactive waste, too, and must be dealt with.

"From the perspective of waste reduction, it doesn't really give us any benefit," said Felix Killar, senior director of nuclear insurance and fuel supply for the Nuclear Energy Institute, an industry trade group in Washington.

Of the 33 nations that use nuclear power, 12 reprocess nuclear fuel, according to the NEI. Some countries reprocess the fuel as a national policy to reduce the need for importing uranium. Reprocessing nations include France, Japan and the United Kingdom.

The United States attempted nuclear fuel reprocessing in the 1970s but stopped the practice under President Carter out of concern about nuclear proliferation. Reprocessing creates leftover plutonium that, in the wrong hands, could be used to manufacture a crude nuclear weapon. Because mining new uranium is much cheaper, reprocessing never gained traction in this country.

Nuclear reprocessing is no simple task. The process requires the construction of costly chemical plants that require oversight from the Nuclear Regulatory Commission.

The appeal of reprocessing has not faded. Last year, Congress allocated \$80 million to pay for research into developing new reprocessing technologies. Some advanced technologies would deplete waste to safe radioactivity levels within a few hundred years. But futuristic reprocessing would also require construction of a new class of nuclear reactors to use the recycled fuel.

No current reprocessing technology can neutralize the radioactivity of the waste. In our age, turning nuclear waste into a harmless byproduct is comparable to other far-fetched proposals for eliminating nuclear waste, such as launching the toxic material into outer space.

STORING RADIOACTIVE WASTE CAN BE RISKY

Here are examples of problems utilities have encountered in storing and moving nuclear waste:

OCONEE NUCLEAR STATION IN SENECA, S.C.

Date: 1996

What happened: Duke Power workers failed to properly place spent fuel rods in the cooling pool's storage racks, about 24 feet under water.

Instead, after fuel inspection, the engineers left the rods for more than three weeks on the spent fuel bridge mast, less than 10 feet under water.

The Nuclear Regulatory Commission fined Duke Power \$50,000, concluding the company had created a risk of extremely high radiation release had the tank accidentally drained and exposed the bridge mast, leaving the forgotten rods unprotected.

The NRC concluded: "Had an accident scenario involving the standby shutdown facility occurred,

Story Tools

 [Printer Friendly](#)  [Email to a Friend](#)
 [Enlarge Font](#)  [Decrease Font](#)

More A Front

- [Campaign law challenged](#)
- [Shiite Islam's holiest city, Najaf, is embracing tourism](#)
- [Distrust divides Duke, patients](#)
- [What about reprocessing?](#)
- [Chile's new president will be a leader unlike any other](#)
- [Buckle up! Seat belt turns 50](#)

requiring water to be supplied from the spent fuel pool, the irradiated fuel assembly could have been uncovered."

POINT BEACH NUCLEAR PLANT, WIS.

Date: 1996

What happened: When a container full of nuclear waste was being welded shut, a spontaneous explosion blew back the 6,400-pound container lid.

The accident caused no injuries or damage but raised questions about build-up of combustible gases that could create hazardous conditions during storage.

The NRC concluded: The seriousness of the problem merited doubling the penalty and fined Wisconsin Electric Co. \$25,000.

EDWIN I. HATCH NUCLEAR PLANT, GA.

Date: 1986

What happened: The plant's spent fuel pool leaked more than 141,000 gallons of water through a wall into an grassy area outdoors.

The leak went unnoticed for several hours. The soil was contaminated with radioactive waste and had to be placed in drums and shipped to a low-level waste site in Barnwell, S.C.

The NRC concluded: "If water had been completely lost from the transfer canal, radiation fields would be high enough that remedial measures may be difficult."

Fine: \$50,000.

HADDAM NECK NUCLEAR PLANT, CONN.

Date: 1984

What happened: When nuclear waste is removed from the reactor and placed in storage, the spent fuel rods are submerged in water at all times to prevent meltdown.

But in this instance, a seal failed in the water canal connecting the spent fuel pool and the nuclear reactor, allowing 200,000 gallons of water from the refueling area to drain out within 20 minutes.

Luckily, the nuclear waste hadn't yet been taken out of the reactor and placed into the refueling area when the water level dropped.

Had workers begun removing fuel during the accident, the NRC concluded that the nuclear waste "could have been partially or completely uncovered with possible high radiation levels, fuel cladding failure and release of radioactivity."

Connecticut Yankee Atomic Power Company paid an \$80,000 fine.

PERMANENT STORAGE OF NUCLEAR WASTE

Finding a permanent solution for radioactive waste has eluded every country that relies on nuclear energy.

The answer for the United States was supposed to be Yucca Mountain in Nevada, a 1,000-foot-deep vault originally scheduled to open in 1998 but now delayed indefinitely. At the site, 63,000 metric tons of nuclear waste from commercial reactors were to be lodged until the end of time.

Congress originally envisioned two geologic vaults. The East Coast candidates included two potential sites in North Carolina: the Rolesville Pluton, a geological formation in Wake County, and the Elk River Massif, a formation near Asheville. In 2002, Congress selected Yucca Mountain as the nation's sole resting place for nuclear waste.

Nevada officials have fought the federal government's plan fiercely for two decades.

They contend that the stainless steel casks would deteriorate and leak radioactivity into a subterranean aquifer 90 miles from downtown Las Vegas.

"The whole thing is about when will the [containers] fail," said Joe Egan, Nevada's lead lawyer in the fight against Yucca Mountain. "We believe they'll fail in 200 years."

With permanent storage at an impasse, a private organization has stepped in with a proposal to round up some of the nuclear waste for temporary safekeeping in one location. The company has signed a land lease with the Goshute Indian tribe in Skull Valley, Utah. But the proposal is tied up in legal and political resistance from the state of Utah.

Last year, Nevada won a critical court ruling on the federal plan to design the Yucca Mountain vault to last 10,000 years. The court ruled that wasn't long enough; it cited scientific evidence that it takes 100 centuries for nuclear waste to decay to the point that it won't contaminate water and plants that could be ingested by animals and people.

Now the Environmental Protection Agency is drafting standards for the desert crypt to remain intact until the nuclear fuel decays to its original radioactivity levels -- about 1 million years.

Meanwhile, the country's nuclear plants have already accumulated about 53,000 metric tons of waste, fast approaching Yucca Mountain's legal limit.

Within the next five years, the Department of Energy was to advise Congress on the need for opening a second repository for nuclear waste, before Yucca Mountain is likely to accept its first ounce of spent nuclear fuel.

Environmentalists in North Carolina fear that with Duke Power and Progress Energy pushing to build new reactors, the two sites originally proposed in North Carolina could be reconsidered.

All rights reserved. This copyrighted material may not be published, broadcast or redistributed in any manner.

© Copyright 2006, The News & Observer Publishing Company

A subsidiary of [The McClatchy Company](#) 