

## The plutonium question

For decades, the question about what to do with America's nuclear waste has had basically one answer: Yucca Mountain. Hold the waste at power plants until it can be shipped to that carved-out mountain lair in remote Nevada, where it can slowly and harmlessly decay for thousands of millenniums. But lawsuits and other political challenges make it doubtful that the facility will open in the next several years. Or maybe ever.

So now the Bush administration and some congressional leaders are proposing a new way to reduce the radioactive risks of Yucca Mountain and possibly avoid building more repositories: recycling.

What if, they ask, you could take the fuel that comes out of a nuclear reactor and instead of burying it in huge casks that must be guarded for centuries, you could recycle some of it and run it through a nuclear reactor again? Maybe even more than twice? What if that means less nuclear waste would be created and the stuff that is left over would be less radioactive?

In theory, it's a powerful and elegant solution. This country has embraced recycling of other commodities. Why not nuclear fuel?

First, a bit of rudimentary nuclear physics. Nuclear power plants operate with uranium fuel rods. When the rods are depleted, they contain small amounts of plutonium. If that plutonium is

separated out, it can be used to make new fuel rods for power plants. Even though plutonium accounts for a tiny fraction of the weight of spent fuel, once separated and made into new fuel it can provide substantial amounts of energy.

It also can be used to build a bomb. A dozen pounds is plenty. The challenge: extract the plutonium in a way that it can be reused in nuclear power plants as fuel-but that would make it difficult to use to make bombs. And do that economically, so you don't spend more in the process than if you simply use new fuel rods made of uranium, a far cheaper option at the moment.

Scientists at Argonne National Laboratory and elsewhere are working on new technology to meet this challenge. Right now, this new recycling technology has only been demonstrated in small experiments. But the Bush administration is set to unveil a \$250 million initiative to speed development of these processes, according to U.S. Energy Department officials.

If the technology works, it could help expand the construction of nuclear plants in America at a time when energy prices are soaring and worries over global warming loom.

Opponents worry that the U.S. is charging ahead at breakneck speed. They note that Congress has ordered the Energy Department to deliver a strategy on recycling by next month, with the hopes of settling on a viable technology by next year. They say that's far too hasty and may

involve an unacceptable risk: nuclear proliferation. The U.S. stopped reprocessing plutonium for civilian fuel in the 1970s over fears it would increase the chance that nuclear weapons would spread. Plutonium, unlike the lethally radioactive spent fuel, is vulnerable to loss or theft.

What's more, there's a global abundance of fresh plutonium ready and waiting to fuel reactors. Thus there's no clamor yet from nuclear utilities for reprocessed plutonium because, remember, for now it would cost more.

Still, there's good reason to continue this research. Argonne's Phillip J. Finck testified last year before a House committee that the nation's need for more nuclear waste storage could be reduced by "a factor of more than 100" if it works.

In World War II, the U.S. rushed to build the first atom bomb in the 1940s, through the crash program known as the Manhattan Project. The urgency was to win the war against the Nazis. There's urgency now, too, but on a different scale. Today America is in a different war. Terrorists prowl the world for nuclear material.

This new technology may be promising in solving a pernicious nuclear waste storage problem. But scientists must first prove that it won't make a dangerous world even more so.

— — *Chicago Tribune editorial*, Published February 4, 2006.

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