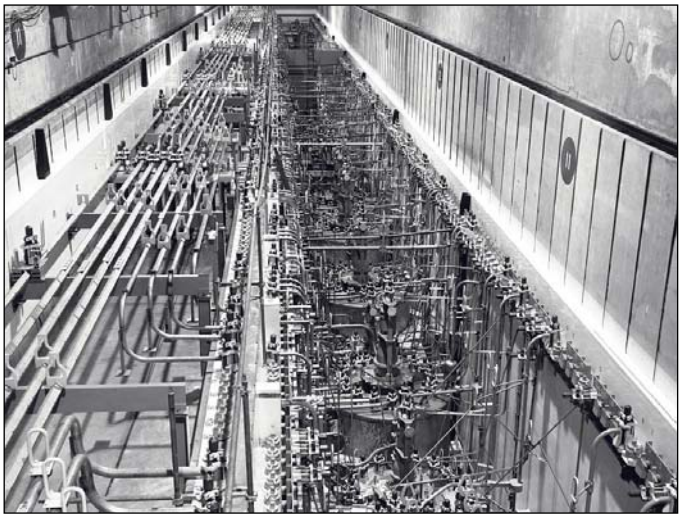
Nuclear Waste Reprocessing

Despite recent interest by the Bush administration and some members of Congress in reviving commercial reprocessing—the separation of uranium and plutonium from irradiated nuclear fuel—as a solution to the country's nuclear waste problem, reprocessing would in fact only exacerbate the problem.[1] Reprocessing—sometimes incorrectly called "recycling"—is simply the separation process. The separated plutonium may be used in fresh fuel for reactors, called mixed oxide (MOX) fuel. Currently, the U.S. has only a few reactors that are licensed to use MOX fuel.

Reprocessing is Extremely Expensive

Approximately $100 billion has been spent globally trying to commercialize plutonium, about $40 billion of which has been used to reprocess commercial and fast reactor irradiated fuel.[2] The only private commercial reprocessing facility in the United States, West Valley in New York State, was an economic and environmental disaster, reprocessing only one year's worth of fuel in six years.

France, England, Russia, India, and soon Japan are the only countries in the world that have commercial reprocessing facilities. China is in the design phase of a pilot facility. All of these programs are heavily subsidized by their governments. A July 2000 report commissioned by the French government concluded that reprocessing is uneconomical—costing about $25 billion more than a "once-through" fuel cycle[3]—and will do little to reduce the amount of long-lived radionuclides in the waste. In England, a recent leak of 20 tons of uranium and plutonium fuel from the government-owned THORP reprocessing plant has led to the plant's operator calling on the government to permanently close the facility,



Reprocessing facility at the Savannah River Site in South Carolina. Photo by U.S. Department of Energy

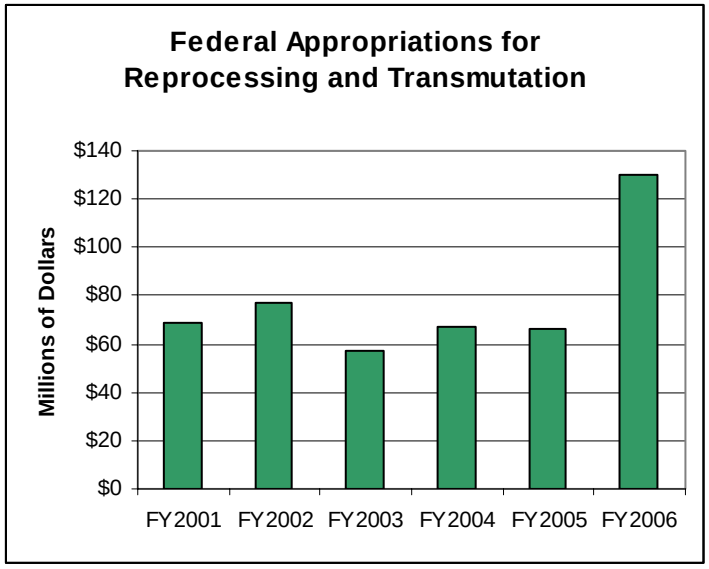
Contamination at the West Valley Reprocessing site in western New York. Photo by U.S. Department of Energy

which has been losing money even when operational. Meanwhile, the Japanese company, Japan Nuclear Fuel Ltd., is about to start up its Rokkasho reprocessing plant, which cost $20 billion (three times more costly than initially estimated) and has taken 12 years to build. MOX fuel produced from the separated plutonium and uranium for use in reactors will be at least 20 times more expensive than low enriched uranium fuel.[4]

Reprocessing is a Security Threat

Reprocessing weakens the global non-proliferation regime to stop the spread of nuclear weapons and weapons-useable materials. About 250 metric tons of plutonium from commercial reprocessing—equivalent to more than 30,000 nuclear bombs—has been separated globally, leaving it vulnerable to theft.[5]

Both the Ford and Carter administrations instituted a "no reprocessing" policy in the U.S. in order to convince other countries to forego this technology. Recommencing reprocessing in the U.S. would send a signal to the rest of the world that the U.S. intends to extract plutonium that



Reprocessing, once against U.S. policy, is getting increased federal funding.[6]

could be used in nuclear weapons, at a time when the United States is seeking to discourage other nations (such as North Korea and Iran) from acquiring such technologies.

The technologies for "proliferation-resistant" reprocessing currently being researched by the U.S. Department of Energy (DOE) differ little from the reprocessing technology used during the Cold War, and thus are not sufficient to prevent theft. Furthermore, even if a proliferation-resistant technology were eventually developed, it would mean the spread of reprocessing expertise and equipment that could be easily converted into a nuclear weapons program.

Reprocessing Harms the Environment

Reprocessing creates high-level radioactive liquid and sludge that must be managed as high-level radioactive waste. During the Cold War, the U.S. reprocessed at nuclear weapons sites (Hanford, Idaho and Savannah River) to obtain plutonium for nuclear bombs. These sites how have over 100 million gallons of high level reprocessing waste sitting in leaking underground tanks that threaten important water resources. The Department of Energy estimates that it will cost over $100 billion to clean up the reprocessing waste at these three sites.[7] Reprocessing at West Valley resulted in high-level radioactive waste, transuranic waste and so-called "low-level" radioactive waste that is still threatening the groundwater and the Great Lakes watershed more than 30 years later. A 1996 estimate on the cost for cleaning up the part of the site that did reprocessing is $5.2 billion.[8]

Reprocessing Cannot Solve the Nuclear Waste Problem

Reprocessing does not eliminate the need for a repository, nor does it significantly reduce the radioactivity of the waste that must be stored in a repository. Proponents of reprocessing hold France and England up as models of how commercial reprocessing can solve our waste problem. But the reality is that these countries also have massive quantities of highly radioactive waste with nowhere to go. In fact, they are dumping some of the radioactive waste into the sea, much to the ire of other European nations. Moreover, no country in the world reprocesses irradiated MOX fuel, because it is too expensive—which ultimately results the problem of finding a disposal site for the highly radioactive irradiated MOX fuel.

REFERENCES:

[1] U.S. commercial nuclear power plants have produced 50,000 metric tons of irradiated nuclear fuel and will continue to produce more as long as nuclear reactors operate.

[2] Arjun Makhijani, *Plutonium End Game Managing Global Stocks of Separated Weapons-Usable Commercial and Surplus Nuclear Weapons Plutonium*, Institute for Energy and Environmental Research, January 2001, p. 27, http://www.ieer.org/reports/pu/index.html.

[3] Annie Makhijani, "French Report Doubts Merits of Reprocessing and MOX," *Science for Democratic Action Vol.9, No.2*, February 2001, http://www.ieer.org/sdafiles/vol_9/9-2/charpin.html. A "once-through" fuel cycle does not include reprocessing; the fuel is used in a reactor one time.

[4] Citizens' Nuclear Information Center and the Institute for Energy and Environmental Research, "Japanese Government Should Halt Construction of Plutonium Extraction and Fuel Fabrication Plant, Say Two Independent Groups in Japan and the U.S.," *Joint Press Release*, http://www.ieer.org/comments/rokk-pr.html.

[5] Steve Fetter and Frank N. von Hippel, "Is U.S. Reprocessing Worth the Risk?" *Arms Control Today*, September 2005, p. 6-12. Irradiated fuel is extremely radioactive, which acts as a protective barrier to theft of plutonium. Separated commercial plutonium can be used to make nuclear weapons and so-called "dirty bombs."

[6] FY2001-2002: Advanced Accelerator Applications (AAA) Program; FY2003: Spent Fuel Pyroprocessing and Transmutation Program; FY2004-2006: Advanced Fuel Cycle Initiative (AFCI). Total spending fiscal years 2001-2006: $466,415,000.

[7] United States General Accounting Office, Report to the Chairman, Subcommittee on Oversight and Investigations, Committee on Energy and Commerce, House of Representatives, *Nuclear Waste: Challenges to Achieving Potential Savings in DOE's High-Level Waste Cleanup Program*, GAO-03-593, June 2003.

[8] Department of Energy, *West Valley Demonstration Project Draft Waste Management Environmental Impact Statement*, May 2003.

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