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A Plan for Nuclear Waste

By John Deutch and Ernest J. Moniz

U.S. policy for managing radioactive spent fuel from commercial nuclear reactors was largely set by the decisions of Presidents Gerald Ford and Jimmy Carter 30 years ago. They decided to forgo spent-fuel reprocessing, a technology developed for separating high-purity plutonium for nuclear weapons. Their decision was based on the cost of reprocessing and on the proliferation risks that would be posed by large quantities of separated plutonium in civilian nuclear power programs across the globe.

This decision committed the United States to direct disposal of irradiated fuel in a geological repository for long-term isolation from the biosphere. Yucca Mountain in Nevada -- adjacent to the nuclear weapons test site -- was subsequently chosen by Congress for development as a repository. Because the spent fuel contains significant amounts of plutonium, and because management of spent nuclear fuel requires a very long time commitment, Congress decided that the government would take ownership of the irradiated fuel and assume responsibility for its transportation and long-term care.

Now, after decades of expensive false starts, and with an uncertain future for Yucca Mountain, Congress and the Bush administration, as reported last week in The Post, are indicating that they might abruptly change course. Such a change, despite good intentions, could further complicate disposal of radioactive waste and heighten rather than reduce public concerns about expanded nuclear power.

We agree that a policy change is called for. Why? First, the rising cost of natural gas and growing concern about global warming have rekindled interest in nuclear power. A prudent response to global warming should include new nuclear plants, based on evolution of current designs to incorporate enhanced safety and streamlined construction, if they have lower construction costs than was the case historically. But significant expansion of nuclear power, together with extension of licenses for current plants, will yield more spent fuel than Yucca Mountain can handle, even if the statutory limits on its capacity are doubled. This will eventually put before Congress one of its least popular chores: finding a site for another nuclear waste repository.

Second, it is unclear whether Yucca Mountain will ever receive a license from the Nuclear Regulatory Commission. After billions of dollars of development and study, the site has been found to have considerably more water than anticipated, and federal courts have ruled that the 10,000-year licensing standard for radiation leakage lacks justification. Yucca Mountain is not dead, but on its current path, it is close to it.

Third, because of schedule slippage at Yucca, the federal government failed in its statutory obligation to begin accepting spent fuel from reactor sites in 1998. This has resulted in ongoing litigation, with possibly substantial financial penalties to be levied on the government and substantial uncertainty for new plant licensing and construction.

Fourth, a new era of global nuclear fuel cycle expansion poses proliferation risks. Iran, which is suspected of using nuclear power development to disguise a weapons program, may be a harbinger of more such confrontations. Urgent concrete action is needed to build on the recent administration

initiative to improve the security of the global nuclear fuel supply.

What is certain is that a decision by the United States to recycle plutonium would upset these efforts. The link between management of spent fuel and the risk of proliferation is clear. If long-lived elements such as plutonium go with the spent fuel to a geological repository, they produce the long-term heating that will be, over many millennia, a threat to the integrity of the repository. If they are removed from the spent fuel by reprocessing, a proliferation risk is created.

What should be done? First, and most important, the government should take title to the spent fuel stored at commercial reactor sites across the country and consolidate it at one or more federal sites until a proper disposal pathway is created. This can be done safely and securely for an extended period and, indeed, such extended storage should be incorporated into a proper disposal strategy. It would take the pressure for a hasty disposal solution off both government and industry.

Second, the president should continue his broad diplomatic effort for supplier countries such as France, Britain, Russia and the United States to supply fresh fuel (and remove spent fuel) for countries with small nuclear power programs if they agree to forgo dangerous and costly fuel cycle facilities for a significant period.

Third, Yucca Mountain should not be abandoned. Rather, the Energy Department should take a fresh look at assessing its suitability under various conditions and adjust the project schedule accordingly.

Fourth, the administration is right to consider reestablishing a strong program to explore ideas for reducing the challenges of long-term waste management while not increasing proliferation risks. But much research is needed, and it will take decades before the viability of such approaches can be evaluated, and still more time before they can be deployed. Premature technology choices and arbitrary schedules for demonstration plants will repeat past mistakes.

Fifth, Congress and the administration should not push for reprocessing of the current spent-fuel inventory. Marginal benefits for disposal are more than offset by cost; by risks to the environment, health and safety; and by the proliferation threat. This last problem, by itself, would undoubtedly provoke considerable opposition in Congress and could undermine the reconsideration of nuclear power that is now gaining momentum.

A successful waste-disposal program has to survive many administrations; a program based on reprocessing will not.

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