

NUCLEAR WASTE IS PILING UP

Wrestling over what to do with the waste has lasted a generation.

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From the moment that the first commercial nuclear power facility began generating electricity in the United States, government and industry have been wrestling with the question of what to do with the used, or spent, nuclear fuel. During the 1960s, the conventional wisdom was that the spent nuclear fuel would be reprocessed and recycled and that the government would take control of the remaining high-level radioactive waste for disposal deep underground. During the late 1970s, however, President Jimmy Carter's nuclear proliferation concerns led to a policy shift: The reprocessing of spent fuel was banned in favor of a policy of storing spent fuel above ground or underground.

In 1982, Congress passed the Nuclear Waste Policy Act, 42 U.S.C. 10101 et seq., which stipulated that electric utilities that owned and operated nuclear power plants would have to enter into a contractual quid pro quo with the U.S. Department of Energy (DOE). Plant owners would pay the DOE one mill (or one-tenth of 1 cent) for every kilowatt hour of nuclear-generated electricity sold to their customers. In return, the DOE would develop a national repository for permanent disposal of the utilities' spent fuel. Power plants would store the spent fuel themselves until the DOE's

facility was ready in 1998, the date established by the act. That facility is the proposed Yucca Mountain Repository in Nevada.

As of this writing—more than a quarter-century after most of the contracts were signed and more than 11 years after the DOE was obligated to begin removing spent fuel from the utilities' plant sites—not a single spent-fuel assembly has been taken by the federal government, even though nuclear utilities have paid the DOE \$16 billion in fees. In fact, the DOE now hopes that Yucca Mountain will begin accepting spent fuel in 2020, even though the head of the program recently said that meeting that deadline is probably an "extreme stretch." Lisa Mascaro, "Director: Yucca nuke dump an 'extreme stretch,'" *Las Vegas Sun*, Dec. 4, 2008, at www.lasvegassun.com/blogs/early-line/2008/dec/04/director-yucca-nuke-dump-extreme-stretch.

Until recently, the United States had not considered building a new nuclear plant in almost 30 years—due to concerns raised by the accidents at Three Mile Island and Chernobyl and the costs and regulatory uncertainties for new nuclear power plants. Although 104 commercial nuclear plants operate in the United States (more than any other

country), only France, Japan, China and a few other countries have been building new nuclear power plants in recent decades.

Meanwhile, the case for pursuing nuclear power in the United States is gaining adherents every day. In addition to a much increased awareness of the security, political and other costs associated with the country's dependence on overseas energy sources, there exists a strong movement to reduce carbon emissions substantially in order to address climate concerns. Projected growth in energy demand in the United States during the next several decades, anticipated restrictions on the use of fossil fuels and advanced nuclear reactor designs also are making nuclear power appear a more attractive option—and, in turn, enhancing the salience and urgency of the spent-fuel issue.

Extensive litigation

Several years before the 1998 deadline, the DOE claimed that its nuclear waste program was behind schedule due to “unavoidable” delays. The nuclear utilities promptly filed lawsuits with the underlying goal of forcing the DOE to begin living up to its end of the bargain. The only remedy that has been obtained thus far—and by only a handful of nuclear plant owners at that—has been reimbursement from the DOE of a portion of the costs of building at-reactor spent-fuel storage capacity.

Needless to say, these costs are substantial. Of the billions of dollars incurred to date, the courts have awarded approximately \$750 million, and perhaps less than half

that amount has been recovered under settlement agreements. See, e.g., *Tennessee Valley Authority v. U.S.*, No. 01-249C (Fed. Cl.), Opinion and Order, Filed Jan. 31, 2006.

The scope of the problem that continues to confront nuclear plant owners is profound. First, there is the direct impact of having to spend billions of dollars to build longer-term, on-site spent-fuel storage capacity. This often begins with reconfiguring the spent-fuel pools located adjacent to the reactor within the plant. For most plants, these pools initially were designed to temporarily hold the spent fuel discharged from the reactor after each plant operating cycle, until it could be shipped off-site for reprocessing. After Carter prohibited this fuel recycling option, the utilities had to increase their on-site storage capacity pending DOE's performance. While often a short-term fix, the spent-fuel pools' storage racks that hold the spent fuel were replaced at many plants to allow for a tighter arrangement of spent-fuel assemblies and thus greater capacity.

After maximizing the storage capacity of the spent-fuel pools, the next step for plant owners has been to transfer sufficiently cooled spent fuel to large steel and concrete casks licensed for storage by the Nuclear Regulatory Commission. Spent fuel must be transferred to these “dry casks” from the spent-fuel pools in order to accommodate the next batch of spent fuel discharged from the reactor. These casks then are placed at an “independent spent-fuel storage installation” built by the utility at the plant site. Given the complexities involved, the costs of

continued at-reactor storage are projected to total several billion dollars, even if the DOE meets its updated 2020 readiness goal. Nuclear Energy Institute, “Safely Managing Used Nuclear Fuel,” at www.nei.org/keyissues/nuclearwastedisposal/factsheets/safelymanagingusednuclearfuel, accessed Jan. 15, 2009; Nuclear Energy Institute, “Status of Used Nuclear Fuel Storage at U.S. Commercial Nuclear Plants,” at www.nei.org/keyissues/nuclearwastedisposal/factsheets/statusofusednuclearfuelstorage, accessed Jan. 15, 2009.

In addition to the direct economic and logistical challenges mentioned above, there is another, perhaps larger, impact on the nuclear power industry and the United States as a whole. With delay after delay, the federal government has sent mixed signals regarding its ultimate plans for handling and storing spent fuel, leaving an entire industry in limbo on this critical issue. As an alternative to coal- and natural gas-fueled power plants, nuclear power could play an important role in American energy independence and reducing carbon emissions that may have a role in global warming. But the uncertainty created by the government's failure to act is a threat to movement in that direction.

Assessing damages

Litigation surrounding spent fuel has presented a number of interesting legal and economic damage issues. The 1982 Nuclear Waste Policy Act essentially forced all nuclear plant owners to sign spent-fuel contracts with the DOE. These contracts, virtually identical for all

nuclear plants, were not negotiated or voluntary, since the utilities were compelled to enter into the contracts in order to maintain the operating licenses for their plants.

Nevertheless, the courts have found the contracts to be enforceable and the federal government liable for its breach of those contracts. Utilities are now proceeding with breach of contract lawsuits before the U.S. Court of Federal Claims to recover the damages that they claim to have suffered as a result of the DOE's failure to perform.

Initially, the DOE attempted to argue that it was only obligated to perform if the repository it was charged with developing was in existence. The U.S. Circuit Court of Appeals for the District of Columbia rejected this argument, holding that the DOE's obligation to perform was unconditional. *Indiana Michigan Power Co. v. Department of Energy*, 88 F.3d 1272 (D.C. Cir. 1996). The DOE then argued that the delay in its performance had been "unavoidable." The DOE pointed to political, technical, legal and scientific hurdles that it claimed kept it from meeting the 1998 deadline established in the Nuclear Waste Policy Act.

More than 10 years ago, the D.C. Circuit, after reminding the DOE of its unconditional obligation to perform, ruled that the DOE was precluded from using its "unavoidable delay" argument as a defense. *Northern States Power Co. v. U.S. Dept. Energy*, 128 F.3d 754 (D.C. Cir. 1997). But just two years ago, that ruling was challenged on jurisdictional grounds by a Court of Federal Claims trial judge presiding over one of the breach of contract cases.

Nebraska Pub. Power Dist. v. U.S., 73 Fed. Cl. 650 (2006). While that argument has yet to be adopted in any of the other dozens of pending spent-fuel cases, the reincarnated "unavoidable delay" issue remains under appeal at the U.S. Court of Appeals for the Federal Circuit.

With respect to determining and quantifying damages, basic guidelines largely have been decided and affirmed on appeal (although the government has not abandoned its attempt for further review of those decisions). Utilities with trial decisions have been awarded the vast majority of their incurred costs to date and are permitted to return to the Court of Federal Claims periodically to recover their costs of spent-fuel storage as they are incurred in the future. See, e.g., *Southern Nuclear Operating Co. Inc. v. U.S.*, No. 08-237 C, *Complaint Filed April 3, 2008 (Fed. Cl.)*.

There is one significant exception to the general success that nuclear plants have had in court. Except under narrow circumstances, the courts typically have been reluctant to allow those seeking breach of contract damages from the government to recover the significant and very real costs of financing the steps necessary to mitigate those damages. Therefore, the nuclear plant owners have been forced to finance their own damages, in many cases for more than a dozen years. These financing costs run as much as \$200 million to \$300 million a year for the industry. (Based on \$2 billion to \$3 billion in damages incurred as of 2008 industry-wide; assumes annual financing costs of approximately 9% (cost of capital).) When forced to

sink millions of dollars into spent-fuel storage expansion because of the DOE's nonperformance, the nuclear utilities must raise more money, curtail investment or, in states where electricity generation is regulated, obtain permission to pass the costs through to consumers. Of course, as long as the utilities are required to finance their damages, the federal government, bearing no costs for any of its delays, has less incentive to resolve these lawsuits.

Of course, although courtroom wins by the utilities continue to affirm the federal government's failure to meet its obligations and to make the government bear a portion of the costs for that failure, those wins by no means represent a solution to the problem of what to do with America's spent nuclear fuel.

President Barack Obama has expressed concern over Yucca Mountain, and for that matter, the nation's overall nuclear waste strategy. The U.S. Senate majority leader, Harry Reid, D-Nev., has made opposition to the project a central focus of his political career. His most recent pronouncement is that all funding for Yucca Mountain soon will be terminated. Some authorities have discussed the possibility of a change in direction—one that focuses (once again) on reprocessing and continued at-reactor storage in the interim.

As the debate as to whether to pursue permanent disposal, long-term storage or recycling continues, the volume of commercial spent fuel sitting at nuclear power plants continues to grow. And the government's own spent fuel and high-level

radioactive waste (for example, from the Navy nuclear program) ultimately must be sent to a permanent disposal site as well.

Nuclear power plants cost billions of dollars and take more than a decade to site, design, license and build. If the country is to continue, and indeed increase, its reliance on nuclear power as a major source of electricity generation, stakeholders including utilities, state regulators, manufacturers, financial institutions and the public need a reliable plan for spent fuel. If that plan is to continue pursuing the development of a single repository at Yucca Mountain, Obama and Congress should work together to open the facility. Additional delay and uncertainty will only cost more. If Reid has his way, Congress should adopt a new strategy for safe and cost-effective long-term storage of spent fuel.

In addition to bringing clarity and a heightened sense of urgency to a national nuclear waste policy, the Obama administration could work to resolve the ongoing litigation involving nuclear utilities that are simply seeking reimbursement for costs they are incurring. While the DOE has settled with a few of the utilities whose contracts it has breached, the process was time-consuming and expensive. Furthermore, for the large majority of plant owners, the DOE's required terms for settlement demand that the utilities give up a large portion of their damages, given the size of the awards that the courts have established.

In October 2007, the U.S. Department of Justice testified before Congress that it had already spent nearly \$100 million defending against spent-fuel claims, even though liability was established long ago. Statement of Michael F. Hertz, Deputy Assistant Attorney General, Civil Division, U.S. Department of Justice, before the House Budget Committee, Oct. 4, 2007. If Obama directed his attorney general and his energy secretary to establish a reasonable framework for settling existing lawsuits, nuclear utilities and the federal government would avoid substantial and ongoing legal costs. Far more important, industry decision-makers and government regulators could move beyond this adversarial posture and begin to work together toward a long-term solution.