

A PERSPECTIVE ON U.S. NUCLEAR WASTE POLICIES FOR THE LAST 40 YEARS
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On January 29, 2010, Department of Energy (DOE) Secretary Steven Chu named a 15-member Blue Ribbon Commission on America's Nuclear Future, as part of the Obama administration's commitment "to promoting nuclear power in the United States and developing a safe, long-term solution for the management of used nuclear fuel and nuclear waste."² The Commission is needed because Yucca Mountain, which has been deemed the "long-term waste solution" since 1987, is being terminated by the administration.

The Commission is an opportunity for a significant national discussion about major nuclear waste issues for the first time in 23 years. Or it could be yet another commission that issues a report that sits on shelves and makes little real impact. Or it could be a one-sided, nuclear industry dominated effort that repackages the failed policies of the past.

During the next two years of the Commission's work, nuclear industry groups will be actively involved. But the last forty years have shown that there is very substantial public interest and concern about nuclear waste, which must be taken into account in policy discussions, as well as site-specific plans. Very significant amounts of nuclear waste are present in dozens of places around the nation at Department of Energy (DOE) nuclear weapons sites and at commercial reactors. Transporting large amounts of waste also would impact millions of people along shipping routes. How well affected communities can effectively participate and how their input is incorporated into the Commission's recommendations will significantly effect public perspectives about the credibility of the Commission and what should happen in the next phase of U.S. nuclear waste policy. All would be well-served by learning from the past, not repeating practices and procedures that have proven inadequate to the task of implementing publicly acceptable, scientifically sound nuclear waste policies.

From the perspective of the past 40 years, there are some important lessons that should be learned. This brief paper describes some of the major ones, primarily focusing on high-level waste and irradiated fuel because that is the Commission's role. The lessons merit additional dialogue, which the Commission should invite and encourage.³

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² <http://www.energy.gov/news/8584.htm>

³ Letter from 28 organizations to Secretary Steven Chu, November 13, 2009.
<http://www.nirs.org/radwaste/policy/chuwasteltr11132009.pdf>

HAVE WE BEEN HERE BEFORE?

The search for nuclear waste repositories has been ongoing for decades. In 1971, the Atomic Energy Commission selected a site near Lyons, Kansas, which was to be operating by 1975.⁴ Further, the Oak Ridge National Laboratories in Tennessee concluded that “most of the major technical problems pertinent to the disposal of highly radioactive waste in salt have been resolved. . . . The total costs for the operation of a salt mine disposal facility were estimated to be only a few thousandths of a mill for each kilowatt-hour of electricity produced.”⁵ Instead, by 1972, because of technical problems and public opposition, the Lyons site had been abandoned.

On March 13, 1978, President Jimmy Carter established a Nuclear Waste Management Task Force, chaired by the DOE Secretary, “to formulate recommendations for establishment of an Administration policy with respect to long-term management of nuclear wastes and supporting programs to implement this policy.”⁶ The new policy was needed because of the inadequacies of radioactive waste management over the previous decades. President Carter also directed that the “deliberations of the Task Force should include opportunity for appropriate participation by the interested public, industry, States, and Members of Congress.”⁷ That Interagency Review Group (IRG) issued its draft report seven months later; received 3,300 comments from governments, industry, other groups, and the public from all 50 states; and issued its final report to the president in March 1979.⁸

Regarding the future use of nuclear energy, the IRG tried to remain neutral because “its task is to help resolve the nuclear waste disposal problem for its own sake.”⁹ The group recognized that “some members of the public believe that the technology for waste disposal is well in hand and question whether the government is moving quickly enough in developing repositories for high-level wastes and otherwise doing enough to allay public concerns,” while others “expressed significant concern over the advisability of increasing the U.S. commitment to nuclear power until there is greater assurance that there can be safe storage and disposal of nuclear waste. . . . Still other members of the public share selected views in common with both of the preceding [sic] groups.”¹⁰

The IRG’s task was to look at all major classes of nuclear waste:

- High Level wastes (HLW) – from nuclear weapons and irradiated fuel from commercial plants,
- Transuranic wastes (TRU) – plutonium-contaminated waste from nuclear weapons,
- Low Level wastes (LLW) – wastes that are not in other classifications,
- Uranium mine and mill tailings.¹¹

⁴ Atomic Energy Commission, 1971. *Environmental Statement Radioactive Waste Repository, Lyons, Kansas*, WASH-1503, June 1971.

⁵ R.L. Bradshaw and W.C. McClain, eds, 1971. *Project Salt Vault: A Demonstration of the Disposal of High-Activity Solidified Wastes in Underground Salt Mines*, ORNL-4555, April 1971, pp. 355-356.

⁶ DOE, 1979. *Report to the President by the Interagency Review Group on Nuclear Waste Management*, March 1979, TID-29442, p. A-1.

⁷ *Id.*, p. A-2.

⁸ *Id.*, p. Preface.

⁹ *Id.*, p. 7.

¹⁰ *Id.*, p. 5.

¹¹ *Id.*, pp. 9-10.

The IRG final report stated: “Because it is not possible to predict with accuracy a number of important future decisions which will impact nuclear waste management, the IRG has used two scenarios to illustrate different potential levels of requirements in management and disposal for both existing and future wastes.”¹² One “lifetime” scenario reflected “a geographically centralized waste management system...designed to minimize the need of LLW burial ground acreage and the need and number of geologic repositories” for TRU and HLW.¹³ The second scenario was “a larger, more decentralized waste management system...structured to maximize burial ground needs and the need and number of repositories...by assuming significant nuclear growth” and other factors.¹⁴ Both scenarios projected waste amounts to the year 2000.¹⁵ Actual amounts in 2000 were considerably less than either scenario estimated, in substantial part because there were many fewer commercial reactors than projected.

Regarding HLW, the IRG supported proceeding with identifying “a number of potential sites in a variety of geologic environments...and insofar as technical and other considerations permit, in different regions of the country.”¹⁶

WHAT’S HAPPENED SINCE 1978?

Uranium mine and mill tailings. In November 1978, the Uranium Mill Tailings Radiation Control Act (UMTRCA) became law with the twin purposes of assessing and remediating tailings at “inactive” or abandoned mill sites and regulating “active” mill sites “to minimize or eliminate radiation health hazards to the public.”¹⁷ While the federal government, states, and Indian tribes have worked to reduce hazards at mill tailings sites, the large volumes of waste – 235 million metric tons at dozens of sites – continue to pose long-term hazards.¹⁸ UMTRCA was passed during the term of the IRG, and its final report devoted only four pages to the subject.¹⁹ Very little has been done about cleaning up thousands of abandoned uranium mines, and the continuing health, environmental, and economic impacts of uranium development have resulted in the Navajo Nation, where a substantial portion of uranium production occurred, passing the Diné Natural Resources Protection Act of 2005 to prohibit uranium mining and processing.²⁰

Transuranic waste. In December 1979, Congress authorized the Waste Isolation Pilot Plant (WIPP) in southeastern New Mexico “to demonstrate the safe disposal of radioactive waste resulting from the defense activities and programs of the United States exempted from regulation by the Nuclear Regulatory Commission.”²¹ President Carter opposed the legislation, but could not veto just the WIPP provision, which was part of the authorization for nuclear weapons programs. The president refused to start construction of WIPP, and in his February 12, 1980,

¹² Id., p. 10.

¹³ Id., p. D-1.

¹⁴ Id.

¹⁵ Id., p. D-3.

¹⁶ Id., p. 62. (emphasis in original).

¹⁷ Public Law 95-604, 1978, Section 2(b). Signed on November 8, 1978.

¹⁸ <http://www.wise-uranium.org/umaps.html?set=tail>

¹⁹ DOE, 1979, pp. 80-84.

²⁰ <http://www.navajocourts.org/Resolutions/CAP-18-05.pdf>

²¹ Public Law 96-164, Section 213, 1979. Signed on December 29, 1979.

Radioactive Waste Management program, he stated: “WIPP will be cancelled since it is unlicensed and cannot accept commercial wastes.”²² Throughout 1980 there was stalemate: President Carter would not proceed with WIPP and Congress would not allow its cancellation.

The stalemate was broken on the second day of the Reagan administration when DOE announced that it would proceed with WIPP, which would begin disposal operations by 1987. Further, “By approximately 1990 all existing waste stored at INEL [Idaho National Engineering Laboratory] will have been removed to WIPP, and the WIPP facility would be in a position to receive and dispose of TRU waste from other defense waste generating facilities. In addition, WIPP will include an experimental facility for conducting experiments on defense wastes, including small volumes of defense high-level wastes.”²³

Because of technical problems with the site and opposition from citizens and some state officials, WIPP did not begin operations until 1999, and the 1992 WIPP Land Withdrawal Act prohibits any high-level wastes.²⁴ The waste that existed in 1981 at INEL (now the Idaho National Laboratory (INL)) is not all scheduled to be disposed at WIPP until 2015, and that date resulted from a lawsuit by the State of Idaho.²⁵ As of March 15, 2010, WIPP has received 8,313 shipments from ten sites and disposed of 65,973 cubic meters of waste,²⁶ or about 38% of its legal capacity limit of 6.2 million cubic feet.²⁷

Low-Level waste. In December 1980, the Low-Level Radioactive Waste Policy Act became law and established that disposal of commercially generated LLW be the responsibility of states and LLW generated by DOE, the nuclear Navy or nuclear weapons, and Greater Than Class C (GTCC) waste would be the federal government’s disposal responsibility.²⁸ For commercial LLW, the law encouraged states to join together in Compacts, so that new sites would be developed to replace the six then operating disposal sites at Beatty, NV; Richland, WA; Barnwell, SC; Maxey Flats, KY; Sheffield, IL; and West Valley, NY. Furthermore, the compacts could exclude waste from states not parties to such compact after January 1, 1986.²⁹ Because it was clear that new disposal sites would not be open by 1986, Congress amended the law to provide an additional seven years until January 1, 1993, for new disposal sites to operate.³⁰

However, because of technical problems and citizen opposition, no new compact disposal sites have been created. The only new disposal site was opened in 1990 by Envirocare (now EnergySolutions) near Clive, UT, and now accepts most of the nation’s Class A low-level waste,

²² Office of the White House Press Secretary, 1980. Fact Sheet – The President’s Program on Radioactive Waste Management, p. 2.

²³ Federal Register, Vol. 46, pp. 9182-9184 (January 28, 1981).

²⁴ Public Law 102-579, Section 12, 1992. Signed on October 30, 1992.

²⁵ http://www.deq.state.id.us/inl_oversight/contamination/settlement_agreement_entire.cfm, Section B.1. October 16, 1995. *Public Service Co. of Colorado v. Batt, No CV 91-0635-S-EJL* (D. Id.).

²⁶ http://www.trusolutionsnm.com/WTS_Data.pdf.

²⁷ PL 102-579, Section 7(a)(3).

²⁸ Public Law 96-573, Section 3, 1980. Signed on December 22, 1980.

²⁹ Id., Section 4(c)(1).

³⁰ Public Law 99-240, Section , 1986. Signed on January 15, 1986.

except for that going to Richland, WA from nine states and Barnwell, SC from three states.³¹ The environmental impact statement (EIS) process for GTCC wastes has not proceeded even to the issuance of a draft EIS.

High-Level waste/irradiated fuel. In January 1983, the Nuclear Waste Policy Act (NWPA) became law “to establish a schedule for the siting, construction, and operation of repositories that will provide a reasonable assurance that the public and the environment will be adequately protected from the hazards posed by high-level radioactive waste and such spent nuclear fuel as may be disposed of in a repository.”³² The law’s schedule provided that by March 1, 1987, the first repository site would be chosen, and it would be operating by January 31, 1998, and that a second repository would be chosen by March 31, 1990.

Less than a month after NWPA became law, DOE Secretary Donald Hodel announced that sites in six states – Louisiana, Mississippi, Nevada, Texas, Utah, and Washington – were potentially acceptable for the first repository site. Secretary Hodel also notified 17 eastern and midwestern states that crystalline formations in those states would be considered for the second repository.

On December 20, 1984, DOE released nine draft environmental assessments on the potential sites, with the sites at Hanford, WA; Yucca Mountain, NV; and Deaf Smith County, TX ranked as the best locations for the first repository.³³ In April 1985, DOE notified Tennessee that three sites in the state would be considered for the Monitored Retrievable Storage (MRS) site that would store irradiated fuel before it went to the first repository. That notification also said that the final site would be selected in January 1986, which did not occur because of the strong opposition to the site and litigation by the State of Tennessee.³⁴ On January 16, 1986, DOE released reports identifying 12 sites in 7 states (Georgia, Maine, Minnesota, New Hampshire, North Carolina, Virginia, and Wisconsin) as potentially acceptable sites for the second repository.³⁵

In all of the states, there was strong, organized opposition that pointed out technical problems with the sites and highlighted the political choices that played an important role in the siting process, and numerous lawsuits were filed against the DOE. Citizen groups from all of the 13 affected states formed the National Nuclear Waste Task Force to share information, and to oppose the entire program because it was technically flawed and politically motivated.

On May 28, 1986, President Reagan announced that the three top-ranked sites would be subjected to extensive surface and underground “site characterization,” and DOE announced that it was suspending the second-round program.³⁶ Widespread public opposition to those decisions resulted in Congress cutting waste program funding from \$769 million to \$420 million and prohibiting underground work at the three sites or proceeding with the MRS.³⁷ In the November

³¹ In addition, the Waste Control Specialists site near Andrews, TX has applied for a low-level waste disposal license.

³² Public Law 97-425, Section 111(b)(1), 1983. Signed on January 7, 2003. <http://epw.senate.gov/nwpa82.pdf>

³³ Federal Register, Vol. 49, pp. 49540-49541 (December 20, 1984).

³⁴ *Tennessee v. Herrington*, 806 F.2d 642 (6th Cir.1986).

³⁵ Federal Register, Vol. 51, pp. 1275-1276 (January 10, 1986).

³⁶ Federal Register, Vol. 51, pp. 19783-84 (June 2, 1986).

³⁷ Public Law 99-500. Signed on October 18, 1986.

1986 elections, new senators were elected in Washington and Nevada who campaigned on stopping those waste sites.

In 1987, the National Nuclear Waste Task Force brought forth a four-point legislative program to put a moratorium on any site-specific work, appoint an independent commission, stop the MRS, and increase funding for on-site storage at reactor sites. That program, supported by many states, tribes, and national environmental groups, resulted in bi-partisan moratorium-commission bills being introduced on July 1, 1987, with more than 50 sponsors in the House and 13 co-sponsors in the Senate. In response, Sen. Bennett Johnston, Energy Committee chairman, sponsored a bill that passed his committee to prohibit second-round activities for 20 years, annul and revoke the decision for an MRS in Tennessee, and allow site characterization at only one of the three first-round sites – the selection of which site to be deferred until after the 1988 elections.³⁸

In December 1987, the congressional compromise was to amend NWPA so that only Yucca Mountain was considered for the first repository. The new law also repealed the requirement for a second repository; prohibited an MRS in Nevada, annulled the Tennessee MRS site, and established a Monitored Retrievable Storage Review Commission; and established a nuclear waste negotiator to find a state willing to host a repository or MRS.³⁹

By 1989, DOE Secretary Watkins admitted that Yucca Mountain would not open by 1998. By 1992, it was clear that the site could not meet some of the Environmental Protection Agency disposal standards, and Congress passed a law to require standards only for Yucca Mountain.⁴⁰ Nonetheless, strong opposition from the State of Nevada and persistent technical problems continued to delay Yucca Mountain's possible opening date and its license application, which was submitted to the Nuclear Regulatory Commission (NRC) on June 3, 2008.⁴¹ On March 3, 2010, DOE filed a motion to withdraw the license application, with prejudice.⁴²

The MRS Review Commission issued its final report on November 1, 1989.⁴³ That three-member Commission held four public hearings, reviewed numerous studies by independent consultants, and visited waste storage sites. It concluded that an MRS linked to the Yucca Mountain repository “as provided in the current law would not be justified.” The Commission recommended two interim storage facilities. Neither an MRS nor the interim storage facilities were ever built or operated.

The Nuclear Waste Negotiators were unable to find a willing host state. Although the NRC licensed an irradiated fuel storage facility on the Skull Valley Goshute Reservation on February 21, 2006, that site will not open because strong public opposition resulted in the Bureau of Indian

³⁸ S. 1668, passed on July 29, 1987.

³⁹ Public Law 100-202. Signed on December 22, 1987.

⁴⁰ Public Law No 102-486, Section 801. Signed on October 24, 1992.

⁴¹ <http://www.nrc.gov/waste/hlw-disposal/yucca-lic-app.html>

⁴² <http://www.state.nv.us/nucwaste/licensing/doe100303withdraw.pdf>

⁴³ Report of the Monitored Retrievable Storage Review Commission, *Nuclear Waste: Is There A Need For Federal Interim Storage?* November 1, 1989.

Affairs refusing to approve the proposed lease and the Bureau of Land Management denying the needed transportation right-of-way.⁴⁴

Thus, despite the requirements of the 1982 NWPA, there is no first repository site, no second repository program, no MRS, and no operating interim storage site away from reactors. The program mandated by the NWPA has effectively failed. The Blue Ribbon Commission could chart a path for how to start over to develop a scientifically sound, publicly acceptable program.

WHAT'S BEEN LEARNED ABOUT IRRADIATED FUEL/HLW SITES?

- * There is no national consensus about the future role of nuclear energy. But how much waste will be generated is an essential aspect of determining how many repositories are needed.
- * What health and safety standards should apply to any repository have not been determined.
- * There are major technical problems with each of the more than 20 potential repository sites that have been identified by DOE.
- * There is substantial public opposition to every proposed repository or MRS site.
- * No state has volunteered to host a repository or MRS site.
- * Irradiated fuel will continue to stay at reactor sites and HLW will remain at DOE sites for decades more.
- * Perceived political decisions by Presidents, Congress, and the DOE have heightened public opposition to waste programs, while failing to create operating sites. That history engenders much mistrust, which will take time, substantially improved public participation, and better performance to overcome.

⁴⁴ Federal Register, Vol. 71, pp. 58629-58630, (October 4, 2006)-BIA. Federal Register, Vol. 71, pp. 57005-57006, (September 28, 2006)-BLM.