

Nuclear Waste

WHAT'S BEEN LEARNED FROM THE FAILED POLICIES OF THE LAST 40 YEARS?

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." The Commission is needed because Yucca Mountain, which has been deemed that "long-term 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 25 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.

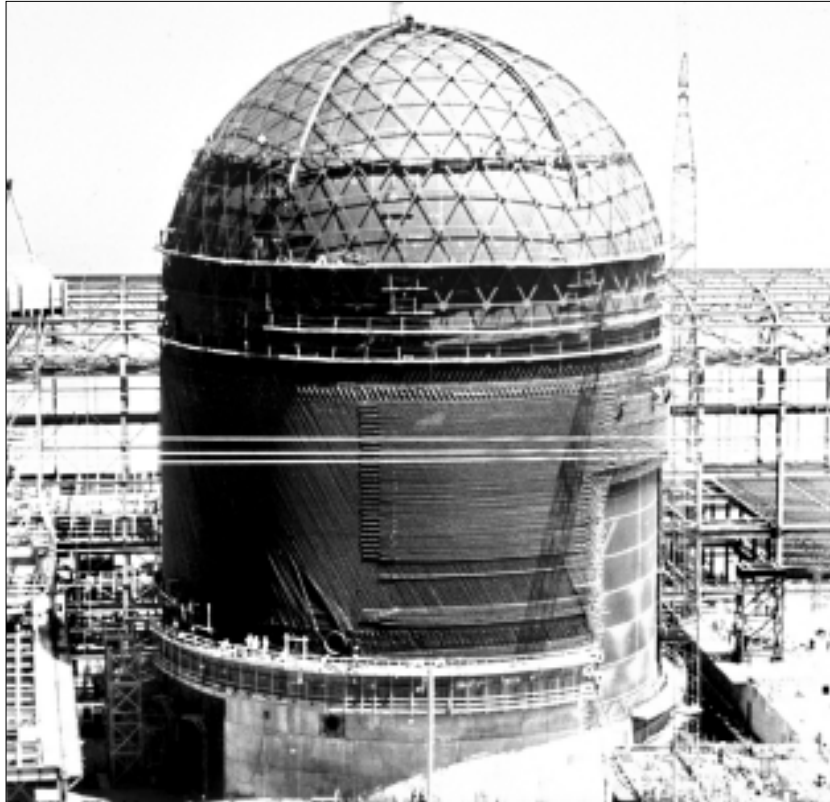
During the next two years of the Commission's work, nuclear industry groups will be actively involved. How well affected communities can effectively participate and how their input is incorporated into the Commission's recommendations will significantly effect what happens in the next phase of U.S. nuclear waste policy. All would be well-served by learning from the past, not repeating it. What are some important points from the past?

HAVE WE BEEN HERE BEFORE?

Starting in the 1950s, the search for nuclear waste disposal facilities has been ongoing. In 1971, the Atomic Energy Commission selected a site near Lyons, Kansas, which was to be operating by 1975. The Oak Ridge National Laboratories in Tennessee then 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." 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." 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." 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.

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." The group recognized that "some members of the public believe that the technology for waste disposal is well in



Decommissioning of a nuclear reactor containment vessel.

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 groups."

BLUE RIBBON COMMISSION MEMBERS

- **Lee Hamilton, Co-Chair** represented Indiana's 9th congressional district from January 1965 – January 1999 and was Vice Chairman of the National Commission on Terrorist Attacks Upon the United States (the 9/11 Commission).
- **Brent Scowcroft, Co-Chair** served as the National Security Advisor to both Presidents Gerald Ford and George H.W. Bush.
- **Mark Ayers**, President, Building and Construction Trades Department, AFL-CIO
- **Vicky Bailey**, Former Commissioner, Federal Energy Regulatory Commission; Former IN PUC Commissioner; Former Department of Energy Assistant Secretary for Policy and International Affairs
- **Albert Carnesale**, Chancellor Emeritus and Professor, UCLA
- **Pete V. Domenici**, former U.S. Senator (R-NM)
- **Susan Eisenhower**, President, Eisenhower Group, Inc.
- **Chuck Hagel**, Former U.S. Senator (R-NE)
- **Jonathan Lash**, President, World Resources Institute
- **Allison Macfarlane**, Associate Professor of Environmental Science and Policy, George Mason University
- **Richard A. Meserve**, President, Carnegie Institution for Science, and former Chairman, U.S. Nuclear Regulatory Commission
- **Ernie Moniz**, Professor of Physics, Massachusetts Institute of Technology
- **Per Peterson**, Professor and Chair, Department of Nuclear Engineering, University of California - Berkeley
- **John Rowe**, Chairman and Chief Executive Officer, Exelon Corporation
- **Phil Sharp**, President, Resources for the Future

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 aren't in other classifications
- Uranium mine and mill tailings

The IRG 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." 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. 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. Both scenarios projected waste amounts to the year 2000. Actual amounts in 2000 were considerably less than either scenario forecasted, in substantial part because there were many fewer commercial plants 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.*" (emphasis theirs).

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." 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. UMTRCA was passed during the term of the IRG, and its final report devoted only four pages to the subject. Very little has been done yet about cleaning up thousands of abandoned uranium mines.

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." President Carter opposed the legislation, but could not veto just the WIPP provision, which was part of the overall law to fund all nuclear weapons programs. However, the president refused to start construction of WIPP, and in his February 12, 1980, Radioactive Waste Management

program, he stated: “WIPP will be cancelled since it is unlicensed and cannot accept commercial wastes.” 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.”

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. 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. As of April 19, 2010, WIPP has received 8,415 shipments and disposed of 66,543 cubic meters of waste, or about 38% of its legal capacity limit of 6.2 million cubic feet.

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 waste would be the federal government’s disposal responsibility. 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, after January 1, 1986, the compacts could exclude waste from states not parties to such compact. Because it became 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.

Nevertheless, 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 receives most of the nation’s Class A low-level waste, except for that going to Richland, WA from nine states and Barnwell, SC from three states.

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.” 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 sites for the first repository. In April 1985, DOE notified Congress that three sites in Tennessee would be considered for the Monitored Retrievable Storage (MRS) site that would

store irradiated fuel before it went to the first repository. The final site would be selected in January 1986, but it did not occur because of litigation by the State of Tennessee. On January 16, 1986, DOE released reports identifying 12 sites in 7 states (GA, ME, MN, NH, NC, VA, and WI) as potentially acceptable second repository sites.

In all of the states, there was strong, organized opposition that pointed out technical problems with the sites, brought lawsuits against DOE, and pointed out that political choices played an important role in the siting process. 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.



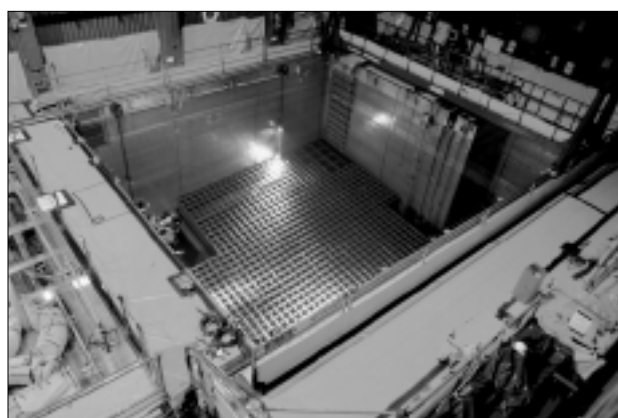
Diablo Canyon Nuclear Power Plant (San Luis Obispo County, CA) irradiated fuel dry cask storage.



Transporting a decommissioned reactor vessel.



Irradiated fuel is moved to dry cask storage.



Irradiated fuel is stored and monitored in a pool.

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. Widespread public opposition 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. In the November 1986 elections, new senators were elected in Washington and Nevada who campaigned on stopping those waste sites.

In 1987, various citizen groups, states, tribes, and national environmental organizations called for a moratorium on the waste program, stopping the MRS, increased funding for on-site storage, and appointment of an independent commission. On July 1, 1987, bi-partisan moratorium-commission bills were introduced with more than 50 sponsors in the House and 13 in the Senate. In response, Sen. Bennett Johnston, Energy Committee chairman, supported by the nuclear industry, pushed a bill through 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.

In December 1987, the congressional compromise was to amend NWPA so that only Yucca Mountain was considered for the first repository. The requirement for a second repository was repealed, no MRS could be built in Nevada and the Tennessee site was annulled, and a nuclear waste negotiator was created to find a state willing to host a repository or MRS.

By 1989, DOE Secretary Watkins admitted that Yucca Mountain would not open by 1998. By 1992, it was clear that that site could not meet some of the Environmental Protection Agency disposal standards, so Congress passed a law to require standards only for Yucca Mountain. 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. On March 3, 2010, DOE filed a motion to withdraw the license application, with prejudice.

The Nuclear Waste Negotiator was 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 Affairs refusing to approve the proposed lease and the Bureau of Land Management denying the needed transportation right-of-way.

Thus, there is no repository and no interim storage sites except at reactor and DOE sites. The Blue Ribbon Commission could be how to stop and start over to develop a scientifically sound, publicly acceptable program. Or it can be the next step in repeating the failed policies.

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 disposal sites are needed and whether non-geologic options should be considered.
- What health and safety standards should apply to any repository have not been determined.
- Major technical problems exist with each of the more than 20 potential repository sites that have been identified.
- Substantial public opposition exists for any proposed repository or MRS site.
- Schedules are not met, and frequently are missed by decades, and disposal costs are grossly understated.
- Perceived political decisions by Presidents, Congress, and the DOE engender significant public opposition and have failed to establish operating sites. That history engenders continuing mistrust, which will take time and improved performance to overcome. 🌩

FOR MORE INFORMATION

SRIC: www.sric.org
Blue Ribbon Commission: www.brc.gov