

THE HIGH-LEVEL NUCLEAR WASTE POLICY DILEMMA - THE FIRST EIGHT DECADES:

A SUMMARY CHRONOLOGY

1945 The first nuclear weapons are produced by the United States. The highly radioactive waste from years of weapons production remains at the federal production sites

1954 The Atomic Energy Act is passed by Congress directing the federal government to promote the peaceful use of atomic energy, with the understanding that disposal of the highly radioactive waste produced would be the responsibility of the federal government.

1957 The National Academy of Sciences (NAS) recommends deep geologic disposal of the long-lived, highly radioactive wastes from nuclear reactors, suggesting that buried salt deposits and other rock types be investigated for permanent repositories.

Early 1960s The Atomic Energy Commission begins investigating the buried salt beds of the Salina Basin beneath Michigan and Ohio, but when state and local officials become aware of the studies, they force them to be terminated.

Early 1970s The Atomic Energy Commission announces that a salt mine, at Lyons, Kansas, would be developed as a high-level radioactive waste repository, only to reverse its decision after Kansas State geologists discover the site to be riddled with abandoned oil and gas exploration boreholes.

Later 1970s Federal government screening of sites for a geologic repository continues with emphasis on buried salt deposits, and on federal nuclear facility sites.

1980 Deep geologic disposal is selected by the Department of Energy (DOE), in an Environmental Impact Statement, as the preferred alternative for permanent disposal of commercial high-level nuclear waste.

1981 President Reagan lifts the ban on reprocessing commercial spent nuclear fuel, earlier instituted by President Carter and then President Ford for non-proliferation purposes. Reprocessing will only be permitted if financed and carried out by the private sector.

1982 Congress passes the Nuclear Waste Policy Act of 1982. The NWPA establishes a repository site screening process, requiring two repositories to assure regional equity; a schedule leading to federal waste acceptance for disposal beginning in 1998; the Nuclear Waste Fund to pay for the waste program with fees collected on the generation of electricity from nuclear power plants. The Act requires that the repositories be licensed by the Nuclear Regulatory Commission using environmental protection standards set by the Environmental Protection Agency.

1983 The DOE names 9 previously screened potentially acceptable repository sites in six states, with 7 sites in salt deposits (Mississippi, Louisiana, Texas, and Utah) and two sites on western federal nuclear facility sites, in buried volcanic rock deposits (Washington and Nevada).

1984 The DOE issues Guidelines for the Recommendation of Sites which include factors that qualify and disqualify sites as required by the Act, and continues investigation of the potentially acceptable sites.

1985 The President, as provided by the Act, determines that highly radioactive waste from nuclear weapons production would be disposed with commercial high-level waste.

1985 The Nevada Legislature establishes by statute the Agency for Nuclear Projects and the Commission on Nuclear Projects to oversee the federal high-level nuclear waste program.

1986 The DOE, in final Environmental Assessments, nominates 5 candidate repository sites, from the original nine sites, and then selects three western sites, in Nevada, Texas, and Washington, for detailed investigation, from which one was to be selected later for repository licensing.

1986 The DOE indefinitely postpones the second repository site screening program, after much objection from states in the northern mid-west and east where 12 potentially acceptable repository sites, in granite, were proposed.

1986 The DOE proposes to Congress that an interim Monitored Retrievable Storage (MRS) facility for commercial waste be authorized for development at a site in Tennessee.

1987 With rising site characterization cost projections (\$1 billion per site) and significant siting delays predicted, the House considers a siting moratorium and nuclear waste policy

review while the Senate is considering sequential characterization of the three candidate repository sites.

Late 1987 A House-Senate conference committee drafts, and Congress adopts the Nuclear Waste Policy Amendments Act with claims it would put the repository program "back on track" by:

- naming Yucca Mountain, in Nevada, as the only site to be characterized for development as a repository;
- ending the second repository screening program;
- prohibiting studies of repository sites in granite;
- linking development of Monitored Retrievable Storage to progress in siting and licensing a repository;
- prohibiting siting the MRS in Tennessee;
- establishing the Office of the Nuclear Waste Negotiator to seek volunteer states or Indian tribes to host a repository or MRS;
- establishing the Nuclear Waste Technical Review Board to review the technical validity of DOE's site characterization work and nuclear waste transportation planning;
- offering Nevada financial benefits in exchange for giving up its legal right to object to development of the repository at Yucca Mountain.

1989 The Nevada Legislature adopted A.B. 222 that prohibits the storage of high-level nuclear waste in the State.

1989 The Secretary of Energy determines that the nuclear waste program could not succeed in its present form and develops a new program strategy that calls for waste acceptance beginning at a repository in 2003.

1990 The National Academy of Sciences Board on Radioactive Waste Management determines that regulation for licensing a repository needs to be less stringent and prescriptive, and DOE needs more flexibility in siting and licensing the repository.

1992 DOE testifies to the Senate Energy and Natural Resources Committee that overly stringent NRC and EPA repository licensing regulations were causing delays and escalating costs in the Yucca Mountain Project, implying that relief was necessary for the project to succeed.

Late 1992 Congress adopted Section 801 of the Energy Policy Act of 1992 that instructed EPA to establish new site-specific environmental regulations for Yucca Mountain based on "reasonable" safety standards recommended by the National Academy of Sciences (NAS), and the NRC was instructed to revise its repository licensing regulations to conform to the new EPA standards.

Late 1992 The Secretary of Energy announced that the efforts of the Nuclear Waste Negotiator to provide a volunteer Monitored Retrievable Storage site had failed, and a new strategy was needed to begin waste acceptance from the commercial reactors in 1998. (The Negotiator Office was terminated in 1994.)

1993- 1994 A new Program Approach was being developed (and finally adopted in 1994). It sets the beginning of waste acceptance in 2010; relies on DOE's development and distribution of Multi-Purpose Containers (for waste storage, transport, and possibly disposal) to begin interim waste storage in 1998; sets out a schedule for site characterization (costing \$6 billion) leading to a repository license application to NRC in 2001; and, defers some site characterization work to a long repository performance confirmation period lasting up to 100 years after beginning waste emplacement.

Mid- 1995 Bills are pending in Congress that put highest priority on DOE providing interim waste storage, at Yucca Mountain, beginning in 1998, or as soon as possible, and continuing Yucca Mountain site characterization as a lower priority. Other bills call for stopping the waste program pending a comprehensive nuclear waste policy review, and other initiatives would stop the repository program and provide only for interim storage.

August 1995 The National Academy of Sciences panel released its recommendations for a new, risk-based site-specific EPA standard for Yucca Mountain. The EPA began drafting new standards for Yucca Mountain which are still pending in mid-1999. NRC expects to issue a site-specific repository licensing rule for Yucca Mountain within one year after the EPA standard is final.

Fall 1995 Congress appropriated only about half of the money DOE said was necessary to implement the Program Approach, which resulted in DOE revising its plans for the program. The development of the Multi-Purpose Container was terminated, as were plans for interim storage. A new schedule was developed for the Yucca Mountain Project that includes a "viability assessment" in late 1998 to be used by Congress to decide whether the site's potential suitability, and the cost and schedule to finish site characterization, license the repository, and operate it are acceptable. If the program continues, the site suitability determination would be in 2001, with a license application to be submitted to NRC in 2002. Repository operations would begin in 2010. The DOE site suitability criteria would also be revised.

May 1996 DOE's new Program Plan is completed. Bills are still pending in Congress to develop an interim storage site at the Nevada Test Site in 1998, and DOE is doing generic planning for an interim site in the event such a bill is passed. President Clinton said he would veto such a bill that names Nevada as an interim storage site. The EPA also has objected to the bills because they contain provisions that would remove EPA's regulatory authority for the site and set a lax, unprecedented radiation protection standard for the site.

Late 1996 In the 1997 Energy and Water Appropriations Act, Congress directed that a Viability Assessment of the Yucca Mountain project be delivered by October 1998. The VA

is to contain (a) a preliminary design concept for the repository and waste package; (b) a total system performance assessment for a Yucca Mountain repository; (c) a plan and cost for the remaining work necessary to prepare a license application; and (d) a cost estimate to construct and operate the repository.

Dec. 1996 DOE issues a Notice of Proposed Rulemaking to revise its site suitability guidelines for a Yucca Mountain repository. It relies on performance assessment and contains no technical qualifying and disqualifying conditions for the site.

1996 The US Court of Claims begins awarding damages to nuclear plant licensees for breach of contract over DOE's failure to begin operation of a Yucca Mountain repository in 1998, as required by the NWPA and DOE contracts with the licensees. An earlier ruling found that damages could not be paid from the Nuclear Waste Fund established by the NWPA, instead they should be paid from the federal Judgement Fund.

1997 House and Senate bills emphasizing interim storage of spent fuel at the Nevada Test Site are again introduced. President Clinton again says he will veto any such bill.

Jan. 1998 DOE issues a revision of its Waste Isolation and Containment Strategy that is re-named the Repository Safety Strategy. Limiting doses from repository releases relies on (a) limited water contacting waste packages; (b) long waste package lifetime; (c) slow rate of release of radionuclides from the waste form; and (d) concentration reduction during transport through engineered and natural barriers.

July 1998 DOE issues a revised Program Plan, estimating the program will cost \$1.47 billion from FY 99 to 2002 when a license application will be submitted. Program cost through FY 98 were approximately \$3 billion.

Dec. 1998 DOE issues the Viability Assessment for a Yucca Mountain repository, reporting that much work still needs to be done for a site recommendation in 2001 and a license application in 2002, but there are no known "show stoppers."

Feb. 1999 NRC proposes a new Repository Licensing rule, specific to licensing a Yucca Mountain repository. It is a performance-based rule that, in advance of EPA repository safety standards being promulgated, proposes a dose limit and defines a critical group of potential dose recipients and their future condition. As required by law, NRC stated it would conform its licensing rule to an EPA repository safety standard when such a standard is promulgated. (As of mid-1999, there was no EPA standard).

Early-mid 1999 House and Senate bills emphasizing interim storage of spent fuel at the Nevada Test Site are introduced again. Again, President Clinton has said he will veto any such bill. Additional bills and amendments are being prepared to direct studies of transmutation technology, and to have the government take title to spent fuel at reactors and otherwise financially assist utilities with on-site storage. In return utilities would have to

agree to cease litigation for damages from the Department of Energy's failure to begin accepting spent fuel for disposal by January 31, 1998.

1999 Nevada Governor and Governor-Elect send a letter to the Secretary of Energy saying that the Yucca Mountain site should be disqualified because it meets the NWSA Site Recommendation Guidelines rapid ground water travel time disqualification factor. DOE does not act, responding that it is still studying the site.

2000 US Senate sustains (64-35) President Clinton's veto of a bill that would establish an interim nuclear waste storage site on the Nevada Test Site near Yucca Mountain.

2001 EPA issues new radiation protection standards for Yucca Mountain as directed in the 1992 Energy Policy Act, but the standard is not consistent with the compliance period recommendations of NAS (in its 1995 report) as required by the Act.

2001 DOE amends its repository site recommendation guidelines to make them specific to Yucca Mountain and to remove NWSA requirements for establishing factors that qualify and disqualify sites from consideration.

2002 Following NWSA procedure, the Secretary of Energy sends a site recommendation to the President that Yucca Mountain be developed as a repository. One day later, the President sends the site recommendation to Congress; Nevada submits its Notice of Disapproval; and Nevada's Notice of Disapproval is overridden by majority votes in both houses of Congress. Contrary to the NWSA requirement that the DOE file a Yucca Mountain License Application with the NRC within 90 days of the override, DOE does not file the application until years later.

2003 Consistent with Nevada water law, the State Engineer denies DOE's application for an appropriation of water to support the Yucca Mountain repository construction and operation, finding that it would be detrimental to the public interest. DOE filed lawsuits in both State and Federal courts seeking to overturn the ruling. Both cases remain in abeyance.

2004 The DC Circuit Court of Appeals invalidates the EPA standard based on its inconsistency with the 1995 recommendations of the NAS regarding the compliance period.

2008 NRC issues its new licensing rule for Yucca Mountain and Nevada files a Petition for Review regarding various aspects of the rule. The lawsuit has been held in abeyance since 2011.

2008 DOE files the Yucca Mountain License Application with NRC and NRC adopts DOE's Final Environmental Impact Statement for a Yucca Mountain high-level nuclear Waste repository.

2008 Nevada has an unprecedented 218 technical, legal, and environmental contentions admitted to the licensing proceeding for adjudication. Admitted contentions from all 17 parties number nearly 300.

2008 EPA files a revised radiation protection standard for a Yucca Mountain repository and Nevada files a Petition for Review regarding various aspects of the standard. The lawsuit has been held in abeyance since 2011.

2009 DOE revises the repository License Application to incorporate the requirements of the revised EPA standard.

2010 DOE files motion with NRC to withdraw the Yucca Mountain license application claiming that it is “unworkable.” The motion is denied by the Atomic Safety and Licensing Board Panel finding that the NRC is required by the NWPA to decide whether to grant or deny the license.

2010 Congress begins its decade-long refusal to appropriate funds to DOE and NRC to continue processing the License application.

2011 NRC suspends adjudication of the Yucca Mountain License Application claiming a lack of sufficient appropriated funds from the Nuclear Waste Fund to carry out the licensing process.

2012 The DOE appointed Blue Ribbon Commission on America’s Nuclear Future issues its report that, among other recommendations, supports a consent-based siting process for nuclear waste storage and disposal facilities and the need for a new institution to implement the nation’s nuclear waste management program.

2013 The DC Circuit Court of Appeals rules that NRC must continue the licensing process with available carry-over appropriated funds until all the funds are expended or Congress appropriates further funds.

2015 NRC staff finalizes its Safety Evaluation Report and an Environmental Impact Statement on groundwater impacts of the repository that it agreed to do after DOE’s refusal to do the work. The suspension of the adjudicatory proceeding remains in effect for lack of funds.

2021 DOE resumes a consent-based siting process development for high-level nuclear waste management facilities that was begun in 2017 but then terminated. The current aim is to develop a process, with public and organizational participation, for consent-based siting of one or more Consolidated Interim High-Level Waste Storage Facilities. A later stage of the program is proposed to focus on permanent disposal facilities. DOE has stated that the NWPA provides the authority for this program up to the point of actually beginning site a

site selection program for a consent-based facility. That action will require Congressional authorization and appropriation.

2022 Nevada files a motion with NRC to lift the suspension of the adjudicatory proceeding for the singular purpose of permitting Nevada to submit three motions for summary disposition of the License Application based on issues in the application for which there are no facts in dispute.

2011- 2023 Numerous bills are introduced in Congress regarding nuclear waste policy, including funding of the Yucca Mountain repository licensing, new national nuclear waste management policy, consent-based siting of nuclear waste facilities, nuclear waste storage priorities, and high-level waste from decommissioned, or decommissioning reactors. None of the bills have been adopted.