The NWPA and the Realities of Our Current Situation

by David R. Hill

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Richard B. Stewart's article, *U.S. Nuclear Waste Law and Policy: Fixing a Bankrupt System*,[1] provides a thoughtful discussion of some of the complex scientific, policy and legal issues involved with nuclear waste generation and disposal. It is packed with useful facts, information, and history, and just the recitation of the history and circumstances of nuclear waste disposal issues and decisions in a readable, understandable form makes a useful contribution.

Stewart argues that the current system of nuclear waste law and po licy, primarily as established by the Nuclear Waste Policy Act of 1982 and amendments to that Act (together, the NWPA)[2] is bankrupt. There are two ways of reading this thesis. The first is that the system is so broken and fraught with problems that it is essentially worthless, and therefore should be discarded (or "liquidated," to use bankruptcy terminology). The second is that while it may have significant problems and difficulties, the system is worth salvaging, perhaps with some elements put aside and others modified, but with many of the basic viable elements retained and moving forward (in bankruptcy terms, a "reorganization"). If Stewart means the former, then I strongly disagree; but if he means the latter, as I believe he does, then I agree with him.

This is not to say that I believe that the NWPA's approach and the process by which the decisions embodied in the NWPA were made represent the best possible approach, or perhaps even a particularly good one, were we only now starting to generate nuclear waste and develop a scheme for its disposal. But of course that is not our current situation. Much as it might be nice to sit quietly in our offices and libraries and think creatively for a few more decades about what to do with spent nuclear fuel (SNF) and high-level radioactive waste (HLW) without regard for the consequences of this delay, I believe that such a course of action would be extraordinarily expensive and complicated, with no prospect at present for producing any better results than those brought about by the NWPA.

I. Some Problems with the Current System

Regardless, as I will explain below, Stewart is correct about many of the points he makes in the article, some of which, although the article was written before the Obama Administration's recent attempts to abandon the Yucca Mountain licensing process,[3] serve to highlight the perilous, expensive, and I believe mistaken course being pursued by the current Administration with respect to the disposal of SNF and HLW.

I agree with Stewart that congressional short-circuiting in the 1980s of the process for selecting a nuclear waste disposal site in the United States may have helped give rise to strong opposition in Nevada and elsewhere to the selection of Yucca Mountain as the site for a nuclear waste repository. Americans often complain about the amount of time it takes to make decisions and take action in this country—witness the current hand-wringing over how fast the Chinese can move forward with building new renewable energy facilities while in many locations in the United States the construction of almost any new energy facility can be mired for years in the process of federal, state and local permitting, National Environmental Policy Act reviews, litigation, etc. But the American system involves a significant amount of permitting and review, stakeholder involvement, and approvals by different government agencies at various levels of government. The decades-long opposition to Yucca Mountain, even after Congress in 1987 designated it as the only site to be studied for a repository, demonstrates what can happen when a congressional (or judicial) desire for "action" overrides what the public has been told will be the process for making a decision. This is exacerbated because politicians of both parties often will play the "you have been wronged" card in an effort to convince the public that the other party has unfairly taken decisions from the public, short-circuited the right process, or otherwise committed process fouls. It is not hard to think of numerous examples of this phenomenon, including some in recent months.

1. Richard B. Stewart, *U.S. Nuclear Waste Law and Policy: Fixing a Bankrupt System*, 17 N.Y.U. Envtl. L.J. 783 (2008). This Comment is based on Stewart's original 2008 published article rather than the version that appears at 40 ELR (Envtl. L. & Pol'y Ann. Rev.) 10783 (Aug. 2010) and may refer to material that appears in the original article only.
2. Pub. L. No. 97-425, 96 Stat. 2201 (1982) (codified as amended at 42 U.S.C. §§10101-10270 (2009)).
3. *See supra* note 1.

I furthermore agree with Stewart that the multiplicity of federal and state regulators under the current NWPA system has created serious problems. Some would argue that this system of multiple regulators has put in place proper checks and balances—one regulator against another. But often this view may reflect more of a desire to see the development of Yucca Mountain, or perhaps any permanent nuclear waste disposal facility, slowed down or stopped altogether. A system of multiple regulators with competing (or perhaps even diametrically opposed) missions is more likely to result in decisional gridlock, or at least one of the required regulators saying "no" to a facility's development. When multiple regulators have responsibility for a single facility or set of decisions, we cannot discount the fact that each regulator comes to the process with its own set of viewpoints, desires, and objectives—and a desire to "add value" by bringing those viewpoints to bear on the facility at issue. Some would view that as a positive overall, and there certainly are times when review by multiple different regulators is necessary and appropriate. But I think there can be no doubt that the existence of multiple, overlapping regulators dealing with a single facility dramatically increases the cost and inefficiency of the overall process, and increases the likelihood that the facility at issue—whether an energy production facility or a nuclear waste repository—will never be built at all.

Stewart is also correct that if we are going to re-think what to do with nuclear waste, we must confront the ethical principle that it is the present generation's responsibility to find a permanent solution and disposal pathway for the nuclear waste and SNF we have produced. This principle of "intergenerational equity" is at the core of the NWPA focus on the establishment of a permanent repository for SNF and HLW. I sometimes hear people question why the United States is so tied in knots with respect to the disposal of nuclear waste and the siting of a repository, while the French do not seem to have any such difficulty. But this is based on a misunderstanding of the situation in France. The French, who are heavily reliant on nuclear power for the production of electricity in their country, are reprocessing their spent nuclear fuel to produce mixed oxide fuel, but they are also trying to develop a deep geological repository because they must dispose of the radioactive byproducts of that reprocessing. Despite a very well planned, multi-decade course of action, they have run into substantial local opposition to the siting of a permanent repository, and have not yet succeeded in siting one. In the meantime, just as in the United States, radioactive waste is stored in shorter-term storage facilities in France.

There obviously are very serious issues of intergenerational equity involved when a decision is made to leave to future generations the problem of managing and disposing of nuclear waste that we generate today. The United States, in the NWPA, decided to take care of its nuclear waste legacy by building a permanent repository, and I believe that was, and is, the most equitable and responsible course of action. But a reasonable case can be made for the alternative approach. It would be contrary to the law as it currently stands, and all who advocate for an approach that does not seek to provide for a permanent repository should be aware of the burden we are choosing to place on future generations, but it is worth discussing if we were to decide to scrap the current NWPA system and start over.

Finally, I strongly agree with Stewart's statement that "[i]f Yucca is abandoned, it will be extraordinarily difficult to site a new repository, and the public perception of failure will be reinforced."[4] It might be different if Yucca was abandoned in favor of a viable Plan B for the permanent disposal of nuclear waste—for example, if Congress repealed the NWPA and simultaneously authorized the construction of a repository in some other location. But abandonment of Yucca Mountain without a Plan B, and prior to the conclusion of the now-ongoing Nuclear Regulatory Commission (NRC) licensing process for Yucca Mountain, would make the siting of a repository elsewhere extremely difficult. Basically, it would teach that if you fight hard enough, and if you refuse to accept the will of Congress and of the majority long enough, you can eventually succeed in thwarting an effort that is in the common good of the country as judged by multiple Congresses and Presidents of the United States.

II. Costs of Abandoning the Current NWPA Approach

Stewart advocates a re-thinking of the process set forth in the NWPA for the disposal of SNF and HLW. He advocates doing so while proceeding with the licensing process for Yucca Mountain as currently envisioned by the NWPA. This is in contrast with the approach of the current Administration, which seeks to stop the Yucca Mountain licensing process at the NRC even though there is no other existing plan for the disposal of the waste that was destined for Yucca Mountain—or, for that matter, even a process for selecting and evaluating such a plan.[5] Thus, the Administration seeks to push the reset button without any particular knowledge of what or even if viable alternatives may exist.[6]

But leaving aside all of the discussion about whether or not it might be a good idea to think about alternatives to licensing Yucca Mountain—and I will briefly discuss some of those alternatives below—the first question ought to be, what course of action is legally required right now? There are strong legal arguments that unless Congress amends the NWPA and repeals the current obligations that the Act imposes on the U.S. Department of Energy (DOE) and the NRC, the licensing process for Yucca Mountain must proceed, and the Administration is without the legal authority to stop it.

In contrast with what may have been a congressional short-circuiting of the process for selecting sites to be studied

4. Stewart, *supra* note 1, at 821.
5. Dep't of Energy, FY 2011 Congressional Budget Request: Budget Highlights 9 (2010), *available at* http://www.mbe.doe.gov/budget/11budget/Content/FY2011Highlights.pdf.
6. Also, at this point there have been almost two years of intensive technical review by the NRC staff of the Yucca Mountain license application that DOE submitted in 2008. This review by more than 200 technical professionals at the NRC has, to my knowledge, exposed no scientific or technical showstoppers with the application or facts that would call for anything other than moving forward with the full consideration of the application.

for a waste repository, there can be no doubt that the NWPA itself sets out an elaborately detailed process for DOE to follow in evaluating the site, and for the Secretary of Energy, the President, the State of Nevada, Congress, and the NRC to follow if Yucca Mountain is to be ultimately approved for the construction of a nuclear waste repository. The NWPA addresses how the Secretary of Energy must make a recommendation, what the President must do with it if he approves of the recommendation, the actions that the State of Nevada may take if it disagrees with the actions of the President, and even the words that are to be used in the resolutions introduced in Congress if Congress wishes to "override" the objections of the State of Nevada to locating a nuclear waste repository at Yucca Mountain.[7]

All of these processes have been followed over the course of the last twenty years or so. This process resulted in the enactment in 2002 of Public Law 107-200, the entire text of which is as follows: "Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That there hereby is approved the site at Yucca Mountain, Nevada, for a repository, with respect to which a notice of disapproval was submitted by the Governor of the State of Nevada on April 8, 2002."[8] Rarely does Congress speak to a question with more clarity. In short, the NWPA was complied with, Yucca Mountain was designated by Act of Congress as the location of a repository for nuclear waste, DOE submitted a license application to the NRC, and the next step in the process is the now-ongoing NRC licensing process.

The NWPA requires that within ninety days of enactment of the resolution approving the Yucca Mountain site as the location for a repository, DOE must file a license application with the NRC for the Yucca Mountain facility.[9] Notably, the Act does not say that DOE "may" file an application, or that it "should" do so. Section 114(b) of the Act states DOE's obligation in unequivocal and mandatory terms: "If the President recommends to the Congress the Yucca Mountain site under subsection (a)"—which he did—"and the site designation is permitted to take effect under section 115"—which it was—then "the Secretary [of Energy] *shall* submit to the [NRC] an application for a construction authorization for a repository at such site not later than 90 days after the date on which the recommendation of the site designation is effective under such section and shall provide to the Governor and legislature of the State of Nevada a copy of such application."[10] It certainly is true that DOE did not manage to submit the application to the NRC within ninety days—rather, it took about six years for DOE to complete and submit to the NRC the seventeen-volume, approximately 8,600-page application after Congress approved Yucca Mountain as the site for the repository in 2002.[11] But once the application was submitted, the NRC took several months to review it, and then in September 2008 "docketed" it after finding it was substantially complete and ready for NRC action.[12] That started a clock under the NWPA pursuant to which the NRC has up to four years to review and issue a decision on the application.[13]

For reasons of its own, the Obama Administration has attempted to abandon the Yucca Mountain licensing process, and DOE has sought to "withdraw with prejudice" the application that the Department submitted in compliance with the NWPA in 2008.[14] The Administration has stated that it has sought to withdraw the application with prejudice because it believes the Yucca Mountain project is not a "workable option."[15] Others would say the Administration has taken this action for purely political reasons.

Regardless, there are strong arguments that there is no legal authority or basis for DOE seeking to withdraw the application. Recently, NRC's Atomic Safety and Licensing Board issued an order that came to that conclusion. In an order issued June 29, 2010, the Board said that the NWPA "does not permit the Secretary to withdraw the Application that the NWPA mandates the Secretary file. Specifically, the NWPA does not give the Secretary the discretion to substitute his policy for the one established by Congress in the NWPA that, at this point, mandates progress toward a merits decision by the Nuclear Regulatory Commission on the construction permit."[16]

Even if proceeding with the current licensing process was not compelled as a matter of law, there are compelling arguments that it is the best policy course. Abandonment of the NWPA and of the now-ongoing licensing process for Yucca Mountain would bring about consequences that have not been fully acknowledged and justified by those supporting abandonment of the process called for by the NWPA.

First of all, refusing to follow the process set forth in the NWPA and abandonment of the Yucca licensing process would not bring about just a few months or years of delay. If the experience with the NWPA and Yucca Mountain has taught us absolutely nothing else, it has demonstrated that resolving questions as to the disposal of SNF and HLW takes a very long time. It took approximately twenty years between the commencement of the process to evaluate and site a defense nuclear waste disposal facility—the Waste Isolation Pilot Plant (WIPP)—near Carlsbad, New Mexico, and that was even with strong local community support for the facility.[17] Even assuming that the successful WIPP timeline would be replicated for a Yucca Mountain replacement at another location, we are not yet even to the point at

7. 42 U.S.C. §§10132-35.
8. Act of July 23, 2002, Pub. L. No. 107-200, 116 Stat. 735 (codified at 42 U.S.C. §10135).
9. 42 U.S.C. §10134(b).
10. *Id.* (emphasis added).
11. U.S. Dep't of Energy's Yucca Mountain Repository License Application for Construction Authorization (June 3, 2008), *available at* http://www.nrc.gov/waste/hlw-disposal/yucca-lic-app.html.
12. Letter from Michael F. Weber, Dir., Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Comm'n, to Edward F. Sproat, Dir., Office of Civilian Radioactive Waste Mgmt., U.S. Dep't of Energy (Sept. 8, 2008), *available at* http://www.nrc.gov/waste/hlw-disposal/letter-to-doe.pdf.
13. 42 U.S.C. §10134(d).
14. U.S. Dep't of Energy's Motion to Withdraw, U.S. Dep't of Energy (High-Level Waste Repository), No. 63-001 (NRC Mar. 3, 2010).
15. *The President's 2010 Budget for Dep't of Energy: Hearing Before the S. Budget Comm.*, 111th Cong. (2009) (statement of Stephen Chu, Sec'y of Energy).
16. U.S. Dep't of Energy (High-Level Waste Repository), LBP-10-11, 71 NRC __, __ (slip op. at 3) (June 29, 2010).
17. Stewart, *supra* note 1, at 791-93.

which the twenty-year clock has started to run. No new site has been selected, and for that matter, there is not even any agreement on how a process would work for selecting a new site. In addition, an entirely new statutory framework would need to be enacted by Congress, implementing regulations would have to be issued by numerous federal agencies, and inevitably many of those regulations would be challenged in the courts. Given all of this, it is optimistic to think that a permanent repository at a new location could be opened much before 2050, if even by then.

Second, there are very significant financial implications—or to put it more bluntly, costs that will be borne by the American taxpayers—if the Yucca Mountain facility is not licensed, constructed and opened. Stewart states in his article that in the NWPA, Congress imposed a liability "hammer" on DOE if it did not start accepting, by January 31, 1998, SNF from the utilities that had generated it.[18] But really, of course, the "hammer" is on the American taxpayers, not DOE per se. The federal government—read that to mean American taxpayers—will have to pay billions of dollars to utilities for having breached the obligation imposed by law to begin picking up the utilities' SNF starting in 1998, and that will be true even if Yucca Mountain is licensed by the NRC and opens around the 2020 timeframe, as the application currently pending at the NRC anticipated. If the licensing process for Yucca is abandoned and the government's compliance with its obligations to accept SNF is delayed for additional years or decades, the federal government's damages liability will likely grow by billions of dollars. These damages are paid from the Justice Department's Judgment Fund, and not from funds appropriated to DOE. And of course, the American taxpayers are on the hook for paying the cost of Judgment Fund payments.

Third, even aside from the additional damages that will be incurred as noted above, it likely would cost tens of billions of dollars to site, characterize, study, analyze, license and construct a repository at a new location. And we currently have absolutely no idea whether at the end of that site selection and licensing process we would end up with a solution that is any better technically than Yucca Mountain, or whether the Administration that is in place at that time would decide that the alternative approach is any more "workable." This seems like quite an extravagant expenditure of money at any time, but particularly now given the very high federal government budget deficits.

Fourth, it is unclear at best as to whether anyone has seriously evaluated the engineering, scientific, and technical implications of delaying by several more decades the opening of a permanent repository for SNF and HLW. A number of nuclear generating plants in the United States began operating more than thirty years ago and have had SNF stored on site since that time. Other reactors were shut down more than a decade ago. If we are going to delay for an additional thirty or forty years (or more) the opening of a repository while we engage in a policy re-think, it seems that at the very least the public ought to know what additional technical complications with existing fuel might occur as a result.

Finally, I believe we ought to recognize that a legislative process happened. Congress made decisions. At some point, is it not time to put pencils down and take action? Moreover, these were not decisions made by a single Congress or by only one political party. In 1982, when the NWPA was enacted, there was a Republican president and the Republicans controlled the Senate, but the Democrats were firmly in control of the U.S. House of Representatives (holding a 244-191 majority). In 1987, when the amendments to the NWPA were enacted that "short-circuited" the site selection process, the decisions again were bi-partisan: A Republican was president, but Democrats controlled the Senate by a 55-45 majority, and also had a sizeable majority in the House, at 258-177. That margin is almost exactly the same majority as the Democrats have held in the U.S. House of Representatives in the 111th Congress in 2009-2010.

III. Are There Reasonable Alternatives to Yucca Mountain and the Current NWPA Process?

So it is clear that we have pursued the development of a facility at Yucca Mountain through various Administrations and Congresses, both Democratic and Republican, and we have spent massive amounts of money doing so. It is also clear that abandoning the process will cost the American taxpayers billions of dollars, and that proponents of abandoning Yucca Mountain have not presented a process for making repository location decisions, proposed actual sites for a repository, or explained and justified methods of dispositioning waste, that appear to be any better than our current path. But surely we have learned some things that will make our decision-making and siting processes better the next time, even if we cannot currently tell how that will be, right? I am not so sure.

I am skeptical about the value of another "blue ribbon commission" to re-think what we ought to do with nuclear waste and SNF. I suppose it is always possible that this time things will be different, but a lot of effort has already been expended in past decades about what to do with SNF and HLW in the United States. The consensus opinion both in the United States and internationally over the past six decades has consistently supported deep geologic repository disposal.

I also think it is a false expectation to believe that if we just get together and talk some more, people will eventually agree on something and everybody will go home happy. There is little precedent for results like that in the nuclear arena. And even if that happy state of affairs did come about, it is worth remembering that the State of Nevada itself passed a resolution in 1975 urging the federal government to choose Nevada for the storage and processing of nuclear materials.[19] Times change, as demonstrated most recently by the Obama Administration's effort to abandon a decades-long process and withdraw the Yucca Mountain license application that

18. Stewart, *supra* note 1, at 808.

19. A.J.R. 15, 1975 Sess. (Nev. 1975).

DOE submitted to the NRC less than two years before. We must be realistic, and appropriately skeptical, about our ability to arrive at a happy consensus where all can agree on a disposal pathway for SNF and HLW.

Reprocessing also may be a fine idea. The French do it, after all. And the Bush Administration promoted the Global Nuclear Energy Partnership, which had a reprocessing component.[20] It also is true that SNF from nuclear power plants still contains the vast majority of the energy content of the uranium fuel originally placed into the reactor.

But nuclear reprocessing plants and technologies are very expensive. A reprocessing plant likely would cost billions of dollars to build, and would end up producing fuel that would only be price competitive with fuel produced from natural uranium if the market price for natural uranium was around $150 or more.[21] The current price of uranium is around $40-50 a pound, so enough said about that.[22] If we do decide as a country that we want to reprocess SNF, reprocessing would have to be massively subsidized with public money in order for it to be even remotely economically viable. Further, to reduce our SNF inventories, we would need a significant amount of new reprocessing capacity. SNF is currently being generated in the United States at a rate of about 2,000 metric tons per year.[23] So to not only deal with that newly generated SNF but also begin to reduce the volume of SNF that already exists, we would need a very large volume of new reprocessing capability.

And even after reprocessing, nuclear waste remains that must be disposed of in a geologic repository. Therefore, reprocessing may reduce the volume of material that must be disposed of, but it does not eliminate that waste altogether. Moreover, many types of waste—such as contaminated fuel, spent fuel from the nation's nuclear submarines and aircraft carriers, the glass logs (or "vitrified" waste) into which some defense-origin liquid high-level waste has been converted, etc., cannot be reprocessed. All of that material must simply be disposed of in a geologic repository, and until it is, it will continue to sit where it currently does in states throughout the country. And the defense-related waste, of course, does not include the SNF from commercial reactors that currently is stored at 131 sites in thirty-nine states.[24] There is a reason that on July 6, 2010, so many members of Congress from both political parties sent a letter to Secretary of Energy Chu demanding that DOE stop dismantling the apparatus to license and build the Yucca Mountain repository, at least until legal questions about the Administration's authority to unilaterally stop the licensing and development process for Yucca Mountain are resolved.[25]

One final thought—the Yucca Mountain repository design provides for retrievability of the SNF and HLW that is placed there until the repository is closed—which probably would not occur until the year 2150 at the earliest. As a result, the design provides for safe storage of nuclear materials in the near term while allowing future generations to remove it and do something completely different with it if technology develops that allows it to be treated or disposed of in a way that society deems more desirable. This design therefore preserves options for a considerable period of time into the future, while at the same time safely disposes of the nuclear materials created by the present generation and mitigates the financial liabilities that in the meantime the federal government is incurring every day.

IV. Conclusion

In sum, I agree with Stewart that the process established by the NWPA is far from perfect. Perhaps a less prescriptive process would have been more desirable. But can we really lament the process fouls that led to the creation of the NWPA in the 1980s, and also lament the extensive public processes called for by that Act, which were followed over the course of the succeeding twenty or so years? I believe not. If we were starting right now to both create nuclear waste and decide what to do with it, there would be a variety of processes we might use to select disposition pathways, and there are a variety of possibilities for disposing of nuclear waste. But that is not the situation in which we find ourselves, and we may as well be honest with ourselves about that.

The inability to push forward with resolve on the process that we have been embarked on for almost three decades does indeed create public doubts. This is unfortunate because nuclear power has been, and continues to be, a critical part of our nation's energy portfolio, and reliably produces massive amounts of electricity with little or no emissions of greenhouse gases and other air pollutants. Yucca Mountain has been chosen by an Act of Congress as the site for the nation's permanent repository for SNF and HLW. It has been the subject of decades of study and debate. It is now properly the subject of a licensing proceeding before the NRC. If the Administration and Congress wish to abandon that process, they should do so only if they repeal the NWPA and by Act of Congress establish an alternative site for disposing of nuclear waste. The alternative should not be years of additional study while both SNF and billions of dollars in costs to American taxpayers pile up. Thinking about what we want to do with the next repository, after Yucca Mountain is built, is just fine, but deciding to perhaps improve on the process the next time around should not be viewed as a substitute for proceeding with the process established by law, and the development and licensing process at Yucca Mountain that has now been ongoing for more than twenty years.

20. Stewart, *supra* note 1, at 800-01.
21. Stewart, *supra* note 1, at 803 (citing Matthew Bunn et al., The Economics of Reprocessing vs. Direct Disposal of Spent Nuclear Fuel §4 (2003)).
22. *See* CME Group, UxC Uranium U308 Swap Futures, http://www.cmegroup.com/trading/metals/other/uranium_quotes_globex.html (last visited July 7, 2010).
23. U.S. Dep't of Energy, Report to the President and the Congress by the Secretary of Energy on the Need for a Second Repository 2 (2008) *available at* http://www.energy.gov/media/Second_Repository_Rpt_120908.pdf.
24. Stewart, *supra* note 1, at 787.
25. Letter from Members of Congress, to Secretary Stephen Chu, U.S. Dep't of Energy (July 6, 2010), *available at* http://murray.senate.gov/public/index.cfm?a=Files.Serve&File_id=f849572d-f3eb-44f2-931d-3a0129eb32d5.