

**Siting and Transportation for Consolidated Used Nuclear Fuel Management Facilities:
A Proposed Approach for a Regional Initiative to Begin the Dialogue – 13562**

Alex W. Thrower* and Lisa Janairo**

*Principal, The Thrower Group LLC, Richmond, VA

**Senior Policy Analyst, Council of State Governments—Midwestern Office, Sheboygan, WI

ABSTRACT

The Blue Ribbon Commission on America's Nuclear Future (BRC) was formed in January 2010 to conduct a comprehensive review of policies for managing the back end of the nuclear fuel cycle, and to develop a new national strategy. Over two years, the BRC held dozens of meetings and heard from hundreds of Federal, State, Tribal, and local officials, as well as representatives of trade and labor organizations, technical groups, nongovernmental organizations, and other stakeholders. The Commission's final report (issued January 26, 2012) offers a strategy to resolve longstanding challenges to responsible management of the United States' nuclear waste legacy. The Commission recommended Congressional action to rewrite parts of the Nuclear Waste Policy Act (NWPA); however, a comprehensive legislative overhaul will likely take years to fully implement.

The nature and characteristics of nuclear waste, the activities that generated it, and the past history of federal efforts to manage the waste make it virtually certain that finding workable solutions will be controversial and difficult. As the BRC report suggests, this difficulty can be made insurmountable if top-down, federally-mandated efforts are forced upon unwilling States, Tribes, and local communities. Decades of effort and billions of ratepayer and taxpayer dollars have been spent attempting to site and operate spent fuel storage and disposal facilities in this manner. The experience thus far indicates that voluntary consent and active partnership of States, Tribes, and local governments in siting, designing, and operating such facilities are critical. Some States, Tribes, and local communities have indicated that, given adequate scientific and technical information, along with appropriate incentives, assurances, and authority, they might be willing to consider hosting facilities for consolidated storage and disposal of spent nuclear fuel.

The authors propose a new regional approach to identifying and resolving issues related to the selection of a consolidated storage site. The approach would be characterized by informed discussion and deliberation, bringing together stakeholders from government, the nongovernmental (NGO) community, industry, and other sectors. Because site selection would result in regional transportation impacts, the development of the transportation system (e.g., route identification, infrastructure improvements) would be integrated into the issue-resolution process. In addition to laying out the necessary steps and associated timeline, the authors address the challenges of building public trust and confidence in the new waste management program, as well as the difficulty of reaching and sustaining broad-based consensus on a decision to host a consolidated storage facility.

INTRODUCTION

In 2010, at the direction of President Barack Obama, Energy Secretary Steven Chu established the Blue Ribbon Commission on America's Nuclear Future for the purpose of devising a new national approach for managing the back end of the nuclear fuel cycle. The Commission was formed to solve a problem that was decades in the making. As the BRC's final report observed, "The United States has traveled nearly 25 years down the current path only to come to a point where continuing to rely on the same approach seems destined to bring further controversy, litigation, and protracted delay" [1].

Congress first acted to address the problem of nuclear waste disposal back in 1982, when it enacted the Nuclear Waste Policy Act to establish a schedule for siting, constructing, and operating one or more geologic repositories for disposing of spent nuclear fuel (SNF) from commercial nuclear power reactors and high-level waste (HLW) generated for defense purposes [2]. The NWPA also established a nationwide, Federal-level policy and responsibility for disposing of SNF and HLW, and provided a framework "to define the relationship between the Federal Government and the State governments with respect to the disposal of such waste and spent fuel" [2]. Congress also found that "[s]tate and public participation in the planning and development of repositories is essential in order to promote public confidence in the safety of disposal of such waste and spent fuel" [2].

The NWPA established a program to identify and characterize several potential sites, select one, and proceed to license, build, and operate a geologic repository. The law also required the U.S. Department of Energy (DOE) to pursue "monitored retrievable storage" (MRS) for a portion of the waste inventory as an operational complement to provide flexibility in meeting Federal obligations to accept waste beginning in 1998. The NWPA also provided for development of a second geologic repository and placed a 70,000-metric ton limit on the capacity of the first repository until the second one became operational. It was widely assumed that two repositories in different parts of the country would provide for "regional equity" in sharing the burden of hosting such facilities [2].

In 1986, then-Energy Secretary John Harrington recommended three sites for further analysis—the Yucca Mountain site in Nevada, the Hanford site in Washington State, and Deaf Smith County in Texas. Shortly thereafter, he also suspended the process for siting the second repository, citing lower-than-expected waste inventories. While there was opposition from state officials and others in the three states that were prospective hosts, there was also some qualified support. The Nevada legislature passed a joint resolution in 1975 (AJR 15) that supported development of storage at the Nevada Test Site if several conditions (such as rail service bypassing Las Vegas) were met. The Washington Legislature introduced a measure in 1982 (SJM 116) that would have provided a consultative process within the state to coordinate with the Federal government on repository development issues. The bill also called for a process to develop regional HLW repositories much like the "compact" approach then being implemented for low-level waste facility development.

Congress enacted amendments to the NWPA in 1987 that were intended to expedite repository development, but may have paradoxically created the opposite effect. The 1987 amendments

effectively eliminated characterization of sites other than Yucca Mountain, cancelled the second repository program, and halted an effort to select a site near Oak Ridge, Tennessee, for an MRS facility [3]. Nevadans understandably raised strenuous objections to this development and referred to the 1987 act as the “Screw Nevada Bill” [1].

The 1987 Amendments Act was not all bad for Nevada. Recognizing the problems inherent in siting storage and disposal facilities, Congress included in the amendments a process for states and tribes to participate in siting discussions on a voluntary basis. The Office of the Nuclear Waste Negotiator was established and was charged with working with states and tribes to develop “reasonable and appropriate terms” under which a state or tribe might agree to host such a facility.

Unfortunately, the two Nuclear Waste Negotiators that were nominated by Presidents George H.W. Bush and Bill Clinton were unable to secure agreement from a potential host, although numerous initial grants were made to communities (including five Indian tribes). The office closed in 1995. One of the tribes, the Skull Valley Goshutes in Utah, later sought to develop a private facility with several utilities—the Private Fuel Storage (PFS) facility. The venture encountered strenuous opposition among Utah lawmakers at the state and federal levels, massive litigation over the project ensued, and despite being granted a license by the NRC, the project even today remains undeveloped.

While the Nuclear Waste Negotiator process and the PFS project unfolded, Yucca Mountain’s site characterization activities continued, and President George W. Bush formally recommended the site for a repository in 2002. The State of Nevada promptly issued its “Notice of Disapproval” as provided in the NWPA, but Congress passed a resolution by a wide margin overriding the State’s disapproval, and the project continued. DOE submitted a license application for the project to the NRC in June 2008, and the Commission began its formal review three months later.

In 2009, shortly after President Barack Obama took office, DOE suspended and later moved to withdraw its license application. All federal activities related to repository licensing and development – including transportation planning – ceased that year. While the Yucca Mountain program was being dismantled, Secretary Chu launched the BRC to conduct a comprehensive review of policies for managing the back end of the nuclear fuel cycle and to recommend a new plan. The BRC conducted a series of hearings over a two-year period, culminating in a final report that was issued in January 2012. In its final report, the BRC found that

“The Obama Administration’s decision to halt work on a repository at Yucca Mountain in Nevada is but the latest indicator of a policy that has been troubled for decades and has now all but completely broken down. The approach laid out under the 1987 amendments to the Nuclear Waste Policy Act—which tied the entire U.S. high-level waste management program to the fate of the Yucca Mountain site—has not worked to produce a timely solution for dealing with the nation’s most hazardous radioactive materials” [1].

The BRC went to some lengths *not* to offer views on the suitability of Yucca Mountain or on the political developments that resulted in the current situation. The report stated the BRC was “not a siting commission” and that, while it recognized Yucca Mountain is the repository site designated in existing law, new storage and disposal capacity will still be needed regardless of whether Yucca Mountain eventually is developed as a repository or not.

One of the BRC’s key recommendations was to develop a “consent-based” approach to siting waste storage and disposal facilities. The Commission found that, while any site must meet the technical threshold of protecting public health and safety and the environment, “finding sites where all affected units of government, including the host state or tribe, regional and local authorities, and the host community, are willing to support or at least accept a facility has proved exceptionally difficult” [1]. The BRC looked at the Yucca Mountain experience, efforts to develop the Waste Isolation Pilot Plant (WIPP) in New Mexico, and siting efforts in Canada and in Europe, and found that

Experience in the United States and in other nations suggests that any attempt to force a top-down, federally mandated solution over the objections of a state or community—far from being more efficient—will take longer, cost more, and have lower odds of ultimate success.

By contrast the approach we recommend is explicitly adaptive, staged, and consent-based...we believe this type of approach can provide the flexibility and sustain the public trust and confidence needed to see controversial facilities through to completion [1].

The approach proposed by the BRC hinges on the concept of identifying potential sites with the consent of the host communities and states. Precisely what “consent” entails, and how one goes about obtaining it and keeping it, continues to generate considerable debate; the Commission did not offer a definitive framework for doing so. An essential element would seem to be trust—trust among the involved parties, trust in the integrity and fairness of the siting process, and trust that commitments made today will be honored in the future. Another element is the ability to negotiate among the parties—all involved entities must have real bargaining power to develop mutually acceptable conditions under which a siting decision can be supported. In addition, there must be incentives and compensation available to states, tribes, and communities that are interested in hosting a facility—including oversight over the facilities to ensure public health and safety is protected.

The Commission did find that, looking at past experience in the U.S. and elsewhere, specific elements of a siting process could inspire trust:

- A clear and understandable legal framework
- An opt-out option for the local affected community, up to a certain point in the process
- The availability of financing for local governments and citizen organizations for conducting their own analyses of the site and siting issues
- Compensation for allowing the investigation and characterization of the proposed site

- A concerted effort to promote knowledge and awareness of the nuclear waste issue and plans for addressing it through mechanisms such as:
 - Seminars, study visits, and reviews conducted by the local government
 - Information to and consultation with local inhabitants
 - Socioeconomic studies and evaluations of impacts on local businesses
- Openness and transparency among and within the implementing organization, the national government, local governments, and the public [1].

IMPLEMENTATION

Many of the recommendations of the BRC will require Congressional action to modify existing law. One key recommendation was to establish a new waste management entity—one outside DOE, and structured as a government-chartered corporation—to implement the waste management mission. It could take years for Congress to establish a new organization; even if Congress acted right now to establish such an entity, it could take several years for that organization to “stand up” and establish staff and programs to take over DOE’s obligations and initiatives. In the interim, DOE remains the organization responsible for implementing the NWPA. For that reason, after the BRC released its report, DOE established an internal working group to examine, among other things, how a consent-based siting approach might work, and what steps the Department might take to begin a siting process until such time as a new entity is established to manage the waste management system. DOE has not yet issued its strategy for implementing the BRC recommendations, but one could expect such a strategy to look at some of the near-term steps the Commission believed should be undertaken while a new entity is being established, including [1]:

- Develop a set of basic initial siting criteria, to avoid delays in investigating clearly unsuitable sites.
- Encourage early expressions of interest from a large variety of communities that have potentially suitable sites.
- Establish initial program milestones to show Congress and the interested public that there is a defined process toward eventual storage and disposal.

DOE faces severe constraints in what it can realistically hope to accomplish in the near term. In the areas of siting and management, despite the broadly positive assessment of the WIPP program’s performance and that of other projects for which it is responsible, DOE generally does not enjoy a high level of public trust and confidence. There are widely divergent opinions about the reasons why the Yucca Mountain project encountered difficulties almost from its inception—many of the factors involved were beyond DOE’s control or influence—but it is reasonable to expect that any siting process that is managed and controlled by DOE will be viewed with a high degree of skepticism.

Given the circumstances, it seems likely there will be a period of some months or years before a new entity can be established, begin operations, and accept responsibility for siting and eventually operating storage and disposal facilities. DOE continues to have responsibility for the waste management program, but owing to a complex set of political and legal developments, it will be difficult for it to launch and manage a new, near-term siting initiative even if it decides on that

course and Congress allows to it do so. So, if the future management entity does not yet exist, and the current management entity is unable to site facilities, what near-term siting actions are possible, and who can undertake them?

PROPOSED APPROACH

The authors propose a regional approach to beginning the dialogue on facility siting. Given adequate scientific and technical information, along with appropriate incentives and preparation, any number of states or tribes might be willing to consider hosting potential storage and disposal facilities, and to support the transportation and infrastructure that will be required to accomplish this task safely and securely. A process to begin exploring the issues on a regional basis, with public and active participation of all interested parties, could help foster informed discussion and deliberation on how to resolve this important national issue.

As envisioned, the dialogue would be national in scope but conducted at the regional level by independent regional organizations that have a history of successfully bringing the states together to interact with DOE on radioactive waste shipments. To take one organization as an example, the Council of State Governments' Midwestern Office has worked with DOE since 1989 on several shipping campaigns, including plans for shipments to Yucca Mountain and ongoing shipments of transuranic waste to WIPP. This experience, coupled with an existing funding vehicle and – most importantly – a network of connections to state government officials – make it possible to launch the proposed initiative within a fairly short lead time by tapping these organizations.

Why begin the discussion at a regional level instead of national? As experience with transportation planning has shown, the regions often have unique perspectives on issues related to nuclear waste management. The Midwest, for example, does not support barge shipments on the Great Lakes or the Mississippi River, while the Northeast and the South have both expressed interest in barge shipments. A regional dialogue on siting will provide an opportunity to identify these types of regional differences while at the same time looking for issues of common concern across the regions.

Under the proposed approach, the regional organization would initiate a dialogue to begin exploring with the region's stakeholders several threshold issues, such as:

- 1) The ideal process for consent-based facility siting;
- 2) The scope of the waste management challenge, and specific potential impacts on current or potential nuclear reactors or defense facilities in their States and regions;
- 3) Current or contemplated regulatory structures, technologies, and scientific approaches to safely and securely manage near-term and longer-term storage, and eventual disposal;
- 4) Transportation planning and infrastructure requirements to support large-scale shipments of spent fuel and other waste;
- 5) Potential terms and conditions under which hosting a storage or disposal facility might be acceptable, which could include (but not be limited to):
 - a. Conditions related to origin, amount, and type of waste;
 - b. Duration of operating periods (for storage facilities);

- 6) Specific regulatory, oversight, consultation and enforcement requirements to ensure the protection of the public and the environment;
- 7) Any compensation arrangements (financial and otherwise) that would be needed or desired by a potential host community; and
- 8) Other potentially significant issues, such as the need for public input, conditions for building public trust and confidence, etc.

The regional dialogue would kick off with an interactive webinar during which regional stakeholders can learn about the need for a new national approach to managing the back end of the nuclear fuel cycle; the efforts undertaken to date to develop that new approach; and the plans for a regional dialogue to help move those efforts forward. Following the webinar, the regional organization would host 4-6 public meetings in various locations throughout the region to give a wide geographic range of stakeholders an opportunity to participate in facilitated discussions about the topics identified above.

Following the example set by the BRC, meetings convened by the regional groups for this purpose would be public, on-the-record events that would allow for substantive public input and comment. The information gleaned from the public meetings would be compiled into a draft report similar to the BRC's "What We Heard" report, which summarized the comments received and, equally importantly, allowed interested stakeholders to see what the Commission thought were the salient points raised and offer corrections as appropriate. A second webinar would present the draft report to stakeholders and solicit their initial input on the report. Following a suitable public comment period, the final report would be prepared for each region. In addition, an aggregation of the four regional reports would identify common themes and unique regional perspectives. These reports and the network of stakeholders participating in the meetings would be important contributions to the eventual "official" site-selection process, whether conducted by DOE or a new entity. With proper funding and planning, a regional dialogue project could be completed in 12-18 months.

CHALLENGES

The proposed regional dialogue project holds promise but is not without its challenges. First, to maximize its utility, each of the four regions would need to participate. It is possible; however, that one or more of the regional organizations would choose not to undertake the project. In that case, another organization could be recruited to take on the project for that region. Depending on the organization, though, the timeline might need to be extended to get staff up to speed and to establish a funding vehicle for funding the project.

Second, it would be desirable to involve a wide variety of stakeholders – state, tribal, and local governments, industry, NGOs, etc. Involving elected officials – the decision makers – is vitally important; however, their involvement could also bring in strong political agendas that could make balanced discussion difficult to achieve.

Third, discussions of consent-based siting coupled with information on transportation could lead some people to assume (incorrectly) that transportation will be consent-based, as well. The potential pitfalls of having this perception take hold may be self-evident—after all, offering any community along a potential route a veto over whether shipments can traverse their jurisdiction is

effectively a veto over the entire program. Existing federal law governing transportation of hazardous materials is quite clear that local and state efforts to prevent movement of such materials is preempted. Further, the extensive experience in the U.S. and internationally in moving radioactive materials suggests strongly that future shipments can be accomplished safely and securely. At the same time, transportation is a highly visible activity and one with which everyone has direct experience. It is reasonable to expect that questions and concerns about transportation will arise during discussion of any potential storage or disposal site, and transportation-related elements may well form part of any negotiated agreements or arrangements made in such siting efforts. Consent-based transportation, however, is not a workable option.

Fourth, as has been the case with the waste management program since its inception, funding could be difficult to secure. The costs of supporting a regional dialogue would be quite modest compared with the amount spent thus far on a repository program whose outcome remains uncertain. However, the costs of convening meetings, supporting travel, conducting communications efforts, and retaining technical expertise would not be trivial, even if regional group staff familiar with the issues are used as a primary resource.

Finally, and related to funding, given its mandate under the NWPA, DOE would be an appropriate source of funding to support this initiative. It would need to be made very clear, however, that the Department's role—or that of any other federal agency, should they elect to participate—would be limited to supporting meeting logistics and costs, and providing information upon request. Any effort by federal entities to exercise control over the proceedings, or the outcome of the dialogue, would risk the legitimacy of the entire effort, especially given DOE's perceived deficit of trust and credibility (whether deserved or not).

CONCLUSION

Siting SNF and HLW storage and disposal facilities using a consent-based process may enable the U.S. to get its waste management strategy back on track—the Blue Ribbon Commission certainly came to this conclusion. Consent-based siting might also fail spectacularly, and could produce yet more delays. But as the BRC itself stated, “we will only know if we start” [1].

What comprises “consent” is exceedingly difficult to define in objective terms; in this sense, it is not unlike Justice Potter Stewart's observation that he could not define obscenity but “I know it when I see it.” Until the U.S. tries consent-based siting and gains specific experience, less subjective, more useful measures of success may not be possible.

What does seem clear, however, is that a siting process directed by the federal government—either through actions by the Department of Energy, another agency, or direct involvement by Congress—is unlikely to produce a result markedly different from what has gone before. However, if states and state-based organizations can start a dialogue on their own initiative and their own terms that would begin to define conditions under which they might be willing to host storage and disposal facilities, that could lay a foundation for further discussion and negotiation which could lead to eventually siting one or more facilities. Given that it will likely take several years either to develop a new national strategy or return to the previous one, trying a regionally-based siting approach in the meantime would be worthwhile.

REFERENCES

1. Blue Ribbon Commission on America's Nuclear Future, *Report to the Secretary of Energy*, January 26, 2012 (hereinafter referred to as "the BRC Report").
2. The Nuclear Waste Policy Act of 1982, Public Law 97-425, January 7, 1983.
3. The Nuclear Waste Policy Amendments Act of 1987, Title V of Public Law 100-203, December 22, 1987.