

# EGAN, FITZPATRICK, MALSCH & LAWRENCE, PLLC

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November 10, 2010

**Via Email: [BRC@nuclear.energy.gov](mailto:BRC@nuclear.energy.gov)**  
**and Regular Mail**

Honorable Lee Hamilton, Co-Chair  
General Brent Scowcroft, Co-Chair  
Blue Ribbon Commission on America's Nuclear Future  
c/o U.S. Department of Energy  
1000 Independence Ave, S.W.  
Washington, DC 20585

Re: Lessons Learned from Yucca Mountain: How to Improve the Process in the United States for Developing Facilities for Geologic Disposal of Used Nuclear Reactor Fuel and High-Level Radioactive Waste

Dear Commissioners Hamilton and Scowcroft:

I have thought about how the process in the United States for developing facilities for geologic disposal of used nuclear reactor fuel and high-level radioactive waste might be improved, and my suggestions are set forth in the attached white paper. I hope you will find them useful.

I make these suggestions from the perspective of someone with forty years of experience in nuclear licensing and regulation, including service as Deputy General Counsel for the U.S. Nuclear Regulatory Commission (NRC), service as an Adjunct Professor of Nuclear Energy Law at George Washington University Law School, and more than a dozen years in private law practice. In private practice I have represented Nevada in opposing the proposed Yucca Mountain repository, but I have also represented proponents of other nuclear waste disposal facilities.

These suggestions look toward the future, and build on what I believe are the lessons that should be learned from the troubled Yucca Mountain repository project. However, I did not attempt to develop any particular "lessons learned" from the current controversy over whether

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the DOE is entitled to withdraw its Yucca Mountain license application, because this is a matter still before the NRC. Nor, for the same reason, did I attempt to draw any "lessons learned" from the conduct of the NRC Yucca Mountain adjudicatory hearing process, as that process has been conducted to date.

While, as indicated, I represent the State of Nevada on matters related to the proposed Yucca Mountain repository, these suggestions represent my personal views. They do not necessarily represent the views of Nevada or any other interested person or entity.

I am sure these suggestions are far from perfect, and I am also sure others will offer different ideas. I merely hope that they contribute meaningfully to a debate on the nature of the next repository program, assuming there is one. It would be very unfortunate if the nuclear power program in this Country foundered because of poorly chosen policies for managing spent fuel and high-level radioactive waste. Also, citizens living near DOE nuclear legacy sites deserve a better program than the one they got.

Sincerely,

*Martin G. Malsch*

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MGM:lb  
Enclosure

**LESSONS LEARNED FROM YUCCA MOUNTAIN:  
HOW TO IMPROVE THE PROCESS IN THE UNITED STATES  
FOR DEVELOPING FACILITIES FOR GEOLOGIC DISPOSAL  
OF USED NUCLEAR REACTOR FUEL  
AND HIGH-LEVEL RADIOACTIVE WASTE**

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Martin G. Malsch  
Egan, Fitzpatrick, Malsch & Lawrence, PLLC

This white paper offers some suggestions about how to improve the process in the United States for developing facilities for geologic disposal of used nuclear reactor fuel and high-level radioactive waste. These suggestions look toward the future, and build on what I believe are the lessons that should be learned from the troubled Yucca Mountain repository project. I did not attempt to develop any particular “lessons learned” from the current controversy over whether the DOE is entitled to withdraw its Yucca Mountain license application, because this is a matter still before the NRC. Nor, for the same reason, did I attempt to draw any “lessons learned” from the conduct of the NRC Yucca Mountain adjudicatory hearing process, as that process has been conducted to date.

I represent the State of Nevada before federal agencies and the courts on matters related to the proposed Yucca Mountain repository, but these suggestions represent my personal views. They do not necessarily represent the views of Nevada or any other interested person or entity.

I. Need.

Prospects for further advances in fuel reprocessing and transmutation technologies (in reactors or other facilities) should not delay the development of a new repository program in the United States. Research and technological developments in the fields of nuclear fuel reprocessing and transmutation will not completely eliminate the need for geologic disposal, although waste volumes, isotopic compositions, and physical and chemical characteristics may change. The development of a new repository program will require lots of time and effort, particularly because contentious legislation amending the Nuclear Waste Policy Act will be required. However, used nuclear fuel can be safely stored for many decades, and there is ample time to get things right.

## II. The Yucca Mountain Project.

So far, almost everything that could go wrong with a geologic repository program in the United States has gone wrong, despite all the best intentions and efforts to avoid past mistakes when the Nuclear Waste Policy Act of 1982 was first enacted into law.

Politics intruded when the search for a repository site in the eastern United States was cancelled, and Nevada justifiably felt victimized when other states effectively ganged up on it in the Congress and statutorily limited the site characterization process to one site in Nevada (Yucca Mountain), effectively committing the Nation to a single site before the scientific data justified it (NRC scientists actually warned the Congress before Yucca Mountain was selected that essential site suitability data was missing). An unmistakable signal was sent that political interference in the program was not only to be expected but also acceptable.

Effective DOE management of the repository program was almost always hindered by annual budget uncertainty and overarching concerns about meeting unrealistic and artificial deadlines that were repeatedly extended. DOE wasted billions of dollars by functioning primarily as a very generous nuclear ratepayer support program for scientists and engineers at national laboratories and government contractors. Moreover, DOE project management operated on the assumption that NRC would not treat DOE like an ordinary license applicant. DOE assumed that NRC would eventually grant the Yucca Mountain license application and that the NRC licensing process would be a negotiation between two sister federal agencies over terms and conditions of approval. Decades elapsed before DOE transitioned to a program directed at actually preparing a license application and prosecuting it before the NRC like any other applicant.

Congress directed that the repository standards development programs at NRC and EPA focus just on Yucca Mountain, creating the inevitable problem that the resulting site-specific standards would always appear to be tainted by a perceived bias toward assuring (or, depending on how politics and policy developed, thwarting) the licensing of Yucca Mountain.

NRC's credibility eroded when it made fundamental changes in its approach to licensing of a repository by eliminating provisions that would have made the licensing of Yucca Mountain difficult if not impossible.

A pre-application process of informal interactions between DOE and NRC dragged on for decades as DOE encountered problem after problem in endeavoring to prepare a complete and adequate license application. The process became the functional equivalent of a piecemeal and resource-intensive licensing review, including informal agreements between DOE and NRC staff on fundamental policy and interpretation questions such as the meaning of defense in depth, all without any application on file and without any effective administrative remedy for project skeptics. NRC's credibility as an unbiased and independent regulator eroded further as a result.

Finally, NRC's *ex-parte* communications rule, prohibiting secret communications regarding the merits of a particular repository between affected outside interests (such as DOE) and the NRC Chairman and Commissioners, was not applied during the pre-application phase, creating the suspicion that the NRC Chairman and Commissioners could be reaching secret agreements with DOE officials.

There is no recipe for assured success here, but surely past mistakes can be avoided. Some suggestions about how to do this follow. The essential principles should be included in Congressional legislation amending the Nuclear Waste Policy Act, especially those principles guaranteeing states meaningful veto rights over a repository within its borders.

### III. Lessons Learned.

First, the repository development program should be entrusted to the private sector – perhaps a corporation or other business organization controlled by generators of used fuel and funded by future Nuclear Waste Fund revenues. The objectives here would be to add private sector project management expertise, avoid the uncertainties associated with the annual budget appropriation and government contracting processes, and minimize political interference in the program. Because federal revenues (from fees) would support the private sector program, the corporation or other business entity would be subject to Government audits and Congressional oversight and have access to DOE sites.

Second, decision making by the developer and regulatory agencies (principally EPA and NRC) must be absolutely transparent. The “decide-announce-defend” approach should be avoided. There must be facilitated and open-minded interactions with stakeholders before notices of proposed rulemaking are published or other concrete proposals are made, and stakeholders must be able to meet face-to-face with development officials and agency heads at appropriate

intervals in open public meetings. The *ex-parte* communications rule, prohibiting secret communications regarding the merits of a particular repository between affected outside interests (such as the developer) and the NRC Chairman and Commissioners, should apply as soon as interest focuses on a particular site and a pre-application consultation process with NRC begins.

Third, there should be no fixed statutory deadline for selection of a site and the filing of a license application. While the developer and regulators will need to use deadlines for efficient project management, the deadlines should be realistic and flexible.

Fourth, we should not indulge in the fantasy that the pre-emptive powers of the federal Government are so great that a site can always be thrust upon an unwilling host state. Even a site located on Federal land is subject to numerous State laws and regulations that can be used to vindicate states' rights absent draconian Federal legislation preempting state law. Therefore, means must be found to enlist the host state's cooperation, or at least non-objection, in developing and licensing a good site. Generous financial or other incentives (a so-called benefits package) can be provided to the host state, but this approach can easily operate or be construed as a kind of unacceptable bribe in return for ignoring the safety of current and future generations of state citizens. Therefore, a potential host state should never be asked to agree completely with, and withhold all objections to, any site or repository before there is reasonable assurance of safety. This asks for too much. Instead, there could be a three-step program as follows that avoids premature commitments on all sides.

(a) In the first step, a state would be offered some benefits package in return for not standing in the way of scientific studies (site characterization) to determine the suitability of a possible repository site within its borders. If, after characterization, the developer believed the site appeared to be suitable, there would be a second step where the potential host state would be offered some benefits package in return for not standing in the way of preparation and filing of a site permit application (as described below). If the state did not object, an application for a site permit would be filed with the NRC and the state would be allowed to participate fully in the NRC permitting proceeding. The state's participation, whether for or against issuance of the permit, would be fully funded by repository proponents.

(b) The NRC would also proceed in a step-wise fashion. It would first entertain an application for a site permit, after its repository licensing regulations are finalized (as described below). The site permit process I have in

mind would address and resolve safety issues associated with long-term post-closure performance, that is, whether the radiological risks associated with the possible environmental releases of disposed radioactive materials are acceptable. This would leave other issues (principally involving the design and safety of above ground support facilities) for later resolution. Problems apart from post-closure performance can probably be addressed satisfactorily (engineered around) for most sites, but post-closure performance problems may be intractable. Therefore, an early focus on post-closure performance will avoid premature commitment of resources and time to an unacceptable site. The NRC NEPA EIS process would be segmented in a similar fashion.

Site suitability determinations will probably require at least a conceptual repository design. Because the conceptual design may change, provision will need to be made for reopening of the site permit (and the state veto) if there is significant new information suggesting the site is no longer suitable.

(c) If the NRC issues the site permit, after full host state participation in the licensing proceeding and completion of any judicial review, there would be step three, where the host state would again be offered a suitable benefits package in return for not using its powers to halt or hinder either the preparation of a suitable application for construction and operation of the repository or, if NRC grants the necessary permit and license, actual construction and operation of the repository. As before, a state's acceptance of the benefit package would be without prejudice to its full participation in the NRC construction permit and operating license proceedings, for or against, with participation supported by project proponents.

(d) The state would have the right to reject the offers of benefits and to veto the site (or "opt out") at all three stages – the pre-site characterization stage, the pre-site permit application stage, and the pre pre-construction permit and operating license stage application (or post site permit) stage. Otherwise, a potential host state will be driven logically to oppose any potential site on the earliest occasion lest it find itself unable to stop the project later.

(e) For the same reason, there should be no Congressional override of any state veto as in the current Nuclear Waste Policy Act. In practice, a pre-defined process paving the way for expeditious Congressional consideration of whether to override a state veto, as under the current Nuclear Waste Policy Act, will almost certainly lead to a veto override in every case. There are two reasons for this. First, the host state's most persuasive potential argument in favor of sustaining its veto, that the site is unsafe, will be dismissed as raising matters that



are more suitable for the NRC than the Congress to resolve (this was the argument when Nevada's veto of the Yucca Mountain site was overridden). Second, Congressional representatives of states where used fuel and high-level wastes are being stored will always serve as a very powerful nucleus of support for the repository. Thus, an override process like the one in the current Act will render state veto rights largely illusory.

Of course, Congress could probably always force a repository on an unwilling host state by enacting draconian pre-emptive, veto-override legislation in the ordinary course of legislative business, without any special rules of Congressional procedure, but the case for preemption and override would need to be fairly compelling in this circumstance given the press of other legislative business. To dissuade the Congress from doing this, the right to veto (or to "opt out") at all three stages might possibly be incorporated into a legally-binding contract between the state, the developer, and DOE (as Administrator of the nuclear waste fund) providing for the state to be paid indemnity damages in an amount sufficient to nearly deplete the waste fund if Congress enacted preemption and override legislation.

However, the hope would be that implacable state opposition and veto at the third and final stage would be difficult to sustain as a matter of public policy in the face of a final NRC decision granting the site permit, after full state participation and completion of judicial review, and the preservation of full state rights to participate in the future construction permit and operating license proceedings. This requires a completely credible NRC licensing process with full funding of State participation. Indeed, the third veto right, after issuance of the site permit, would offer a powerful incentive to NRC to conduct a complete credible site permit review and hearing.

The rights and interests of local governments must also be respected, but the relative functions of state and local governments should not be the subject of federal law, but left to state law.

Fifth, repository licensing standards should be generic and not site-specific and should not be substantially changed after they are promulgated except after defined intervals of ten years or more. Standards must be in place before any site is proposed or selected for characterization. Further, substantial rule changes should apply only to sites not yet selected for characterization. These provisions should avoid or at least minimize the credibility problem caused when agencies appear to adjust their standards to facilitate licensing of a particular site.

EPA's role should be limited to setting a quantitative risk standard that the post-closure risk of premature cancers (the only plausible radiological risk from radioactive materials that could leak from the repository) should be no greater than the premature cancer risk deemed acceptable in EPA's regulation of non-radiological hazards. The credibility and defensibility of EPA's repository standards would be undercut if they appeared to be less stringent than those that EPA applies to similar hazards. EPA should also adopt the principle, now part of international law, that the risk to future generations should be no greater than the risk deemed acceptable today. The NRC would implement EPA's risk goal and intergenerational equity principle in its own standards setting and licensing processes.

I considered but then rejected another approach to repository standard-setting whereby the repository would be treated as a kind of intervention to minimize existing radiological risks, namely the radiological risks of long-term and possible indefinite storage of used fuel and high-level waste on existing sites. Under this approach, a repository risk would be acceptable if transportation and subsequent disposal would create less risk than leaving the fuel and waste where it is. However, while this approach may seem logical, it presents some serious problems. It ignores the possible inequities associated with transferring risks from storage sites to repository sites; it presents the practical problem of defining, quantitatively, the risks presented by storage at existing sites; and it could not logically apply to wastes to be generated in the future.

Sixth, the Nuclear Waste Technical Review Board, or a future equivalent advisory committee, should continue to advise the new repository developer. It should also comment on proposed NRC repository rules.

Seventh, there should be limits on the informal pre-application interactions with the NRC. Informal interactions with NRC before an application is filed should not include site- or design-specific safety questions, regardless whether these questions pertain to the completeness of information or the prospective merits of the site or design.

While significant questions about NRC regulatory policy and questions regarding how NRC's repository regulations should be interpreted can and should be addressed before the application is filed, to minimize regulatory uncertainty, there must be an interactive and transparent process for resolving them. As indicated above, NRC's *ex parte* communications prohibition should apply during the pre-application interaction process, and the Commission and its atomic safety

and licensing boards could entertain briefing and oral argument on interpretation questions and resolve them by issuing formal interpretations.

Finally, there should be no requirement that the used fuel be retrievable for a substantial time after it is placed in the repository. If the owner of the used fuel believes it should be disposed, it should be presumed to have no residual value and to be suitable for disposal as a waste. On the other hand, if the fuel owner believes the fuel has some potential resource value, presumably because of favorable developments in fuel reprocessing and recycling, then it should not send the fuel to a repository for disposal, but instead store it for eventual transportation to a reprocessing facility, whose owner would accept responsibility for vitrifying (solidifying) the residual reprocessing wastes and sending any long-lived, high-level wastes to the repository. The economics of re-cycled (mixed oxide) fuel would control the decision, not the Government. However, it would be understood that extremely prescriptive and expensive Government regulations addressing nuclear non-proliferation concerns associated with recycled fuel (theft and diversion of weapons usable materials) may make the production and use of recycled fuel prohibitively expensive.

Preserving the option to retrieve may have some operational safety benefit while the fuel is being disposed, so that emplacement problems can be corrected, but after the repository is filled one would not expect to see environmental releases from even a poorly performing repository for several hundred years. Preserving the option to retrieve for such a long period may not be practical or realistic. It would also automatically eliminate salt formation sites where movement of the salt around the disposal casks would make retrieval impossible.

#### IV. Conclusion.

It would be unfortunate if the nuclear power program in this country foundered because of poorly chosen policies for managing spent fuel and high-level radioactive waste. Also, citizens living near DOE nuclear legacy sites deserve a better program than the one they got.

I offer the above suggestions with these considerations in mind. They are not perfect, but they attempt to address past problems, and I hope that they contribute meaningfully to a debate on the nature of the next repository program. And, again, these suggestions represent my personal views. They do not necessarily represent the views of Nevada or any other interested person or entity.