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## Policy Implications of Alternative Spent Nuclear Fuel Management Strategies

TOM LATOURRETTE

CT-352

November 2010

Testimony presented before the Blue Ribbon Commission on America's Nuclear  
Future on November 15, 2010

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**Statement of Tom LaTourrette<sup>1</sup>**  
**The RAND Corporation**

***Policy Implications of Alternative Spent Nuclear Fuel Management Strategies<sup>2</sup>***

**Before the Blue Ribbon Commission on America's Nuclear Future**

**November 15, 2010**

If nuclear power is to be sustainable and accepted by the public, the nation must implement a strategy for managing spent-nuclear fuel that meets safety, security, and environmental standards. There is a broad international consensus that management of spent nuclear fuel will ultimately require permanent geological disposal of long-lived radionuclides. Permanent geological disposal need not occur immediately, however, and technical options exist that can buy time for an incremental approach to repository development and possibly also change the characteristics of the waste.

The key points of my comments are that (a) the array of technical approaches for dealing with spent nuclear fuel is limited and generally understood technically and (b) a useful way to distinguish among alternative spent nuclear fuel management strategies is the extent to which they address different societal priorities.

**Evaluation of Technical Approaches**

There are four basic technical approaches to managing spent nuclear fuel: storage at nuclear power plant sites, centralized interim storage, pursuing advanced fuel cycles with spent-fuel recycling, and permanent geological disposal. Our evaluation of these technical approaches indicates that:

- There is generally no pressing technical urgency to remove spent fuel from nuclear power plant sites.
- Centralized interim storage would be comparable to on-site storage in terms of safety, security, technical feasibility, and cost.

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<sup>1</sup> The opinions and conclusions expressed in this testimony are the author's alone and should not be interpreted as representing those of RAND or any of the sponsors of its research. This product is part of the RAND Corporation testimony series. RAND testimonies record testimony presented by RAND associates to federal, state, or local legislative committees; government-appointed commissions and panels; and private review and oversight bodies. The RAND Corporation is a nonprofit institution that helps improve policy and decisionmaking through research and analysis. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors.

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- While some advanced fuel-cycle configurations have the potential to significantly reduce geological repository capacity requirements, they may have little benefit in terms of reducing a repository's long-term environmental risk.
- Technical obstacles to developing a permanent geological repository that meets current regulatory requirements are likely to be surmountable.

### **Distinguishing Alternative Spent Nuclear Fuel Management Strategies**

Technical approaches can be combined to develop four general strategies for managing spent fuel:

- Expeditiously proceed with Yucca Mountain
- Develop centralized interim storage in conjunction with re-opening the site-selection process for a permanent geological repository
- Continue surface storage while aggressively pursuing advanced fuel cycles
- Maintain extended on-site storage

These strategy alternatives can be distinguished in terms of the extent to which they address societal priorities related to the responsibility for spent fuel management, the implications for the welfare of future generations, and the implications for the future of nuclear power in the United States. Aggressively pursuing advanced fuel cycles is attractive primarily if constraints on repository capacity or uranium resources are important. Maintaining extended on-site storage is attractive only if all other options are deemed unacceptable. Proceeding with Yucca Mountain or the centralized storage-geologic disposal strategies are most attractive when facilitating the growth of nuclear power and not leaving spent fuel disposal for future generations are the top priorities; choosing between them depends on how important it is to increase confidence in decision consensus and repository performance.

Choosing a strategy entails assessing these preferences among stakeholders: it might be difficult to achieve a consensus. It is likely that no single strategy will satisfy all stakeholders in all three dimensions we examine. However, in bringing the multitude of technical and institutional considerations together in the form of a limited set of preferences, we hope this analysis will contribute to consensus building and help guide that decisionmaking process.