

Summary of Comments for the
Blue Ribbon Commission on America's Nuclear Future

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What are the essential elements for a technically credible, workable, and publicly acceptable framework for managing the nuclear fuel system? I will focus chiefly on the aspects that concern credibility and acceptance by the public, based on two decades of research sponsored by the Sandia National Laboratories, the National Science Foundation, and my home universities in New Mexico, Texas and Oklahoma.

Public credibility and acceptance of radioactive materials management options are affected by developments in the policy and regulatory process over time. This is evident from the substantial growth of public support for the Waste Isolation Pilot Plant (WIPP) facility in New Mexico from 1990-2001, changing from substantial public opposition to majority support. For nuclear fuel cycle (NFC) management options, the *policy design* sets the starting conditions and prospects for public support. Key features of the design for used nuclear fuel (UNF) disposal in the US been that (a) the material is once-through "waste", and (b) the facility is intended exclusively to permanently entomb that waste. Public debate has been framed by these attributes, and therefore dominated by arguments over the prospects for minimization of the physical, economic and social harms to the host state and local communities. This makes any UNF facility a very tough sell. That difficulty is compounded in that it places state-level representatives in the position of defending their constituents from a policy consisting of imposed risks in which the federal government can in the future (due to the Constitutional supremacy clause) change policy unilaterally.

Variation in UNF policy design can substantially alter the basis for public support. Though public opinion on UNF policies is still relatively nascent, a policy design that combines a repository with program attributes that offset perceived harms substantially increases public receptivity. Among attributes that increase support is retrievability for purposes of altering the policy or the facility (a) in light of new knowledge and technology that can increase safety and/or (b) exploiting the resource value of the UNF. In particular, combining a repository with a technical research program to ensure safe disposal substantially increases support even among those initially inclined to oppose the facility. Similar increases in support are evident for a UNF repository design that includes the option of reprocessing. As in the EU policy debate, public support for inclusion of retrievability is robust even when proliferation concerns are made prominent.

Maintaining technical credibility of the regulatory process of UNF management poses several important challenges. First, the public does not expect the communication of UNF risks to be unbiased. With the exception of experts representing the National Academy of Sciences, experts important in NFC risk communication (from regulatory agencies, national labs, and interest groups) are expected by large fractions of the public to systematically understate or overstate the risks of UNF management. Therefore relying on risk communication efforts to substantially change public perceptions of risk is extraordinarily difficult. In this context, it is far easier to undermine technical credibility (through apparent lapses) than it is to regenerate it. From the perspective of the technical communities involved in assessing possible repository sites, the changing regulatory environment that ensues over the transition from site characterization to licensing substantially shifts the professional and ethical context in which they work. Technical communities place a premium on open communication and peer review, which tends to be undermined in the adversarial regulatory procedures involving licensing. In the interest of maintaining technical credibility, the technical organizations involved in NFC analysis risk assessment should anticipate these transitions, both in the relevant organization culture and training and in the design of the relevant regulatory processes.