**Development of a High-Level Radioactive Waste Regulatory Structure.**
**Michael Voegele**

The U.S. high-level radioactive waste repository legal and regulatory structure was developed over nearly 50 years. It was defined by Federal panel as well as National Academy committee recommendations. There were notable points of apparent progress, yet the entire process was characterized by disagreements and lawsuits. Issues arose due to: well intentioned policies that proved not only difficult to implement but that also were subject to manipulation; original regulations that had not considered certain aspects of disposal and that needed to be changed; expectations on the parts of all parties that were either not clearly understood or were unattainable as originally envisioned; significant technical advances in numerical modeling capabilities; and the responsibilities of two regulators with differing perspectives on how to address long term safety.

The U.S. regulations in place today can be considered to be more proscriptive and restraining than any others developed to date; there remains, however, a sense that there is a need for new, generic regulations, and that the regulatory structure for the program must be in place well in advance of future site screening activities. Not surprisingly this is traceable in large extent to experience gained during the development of the Yucca Mountain program regulations. It is likely that any attempt to develop new generic regulations, if they have the proscriptive nature as those today, also will not withstand the tests of time. Multiple regulators and public expectations compound the difficulty of sorting out a path forward.

It could be argued that because generic versions of the Environmental Protection Agency and Nuclear Regulatory Commission regulations, as well as the Department of Energy siting guidelines, are still in force, that they could be used should the country become involved in another site screening program. It must be recognized, however, that the technical advances and policy changes that have been reflected in the site-specific Yucca Mountain regulations and to some degree in the regulation used at the Waste Isolation Pilot Plant, would likely be required attributes or components of any new repository siting program regulations.

The National Academy of Sciences noted in their 1990 report *Rethinking High-Level Radioactive Waste Disposal,* that the U.S. regulatory structure was rigid and inflexible and needed to be developed as the program moved forward. Adverse public reaction to the development of the regulatory structure for Yucca Mountain does not show this to be an acceptable approach in the manner the Yucca Mountain regulations were developed. Rather, the development shows a lack of commitment by the responsible agencies to involve all affected parties in a meaningful way.

The amendment of the Nuclear Waste Policy Act in 1987, which selected Yucca Mountain as the single site to be studied, led to several associated policy directives that affected the regulatory structure. Principally, the Nuclear Regulatory Commission and Environmental Protection Agency regulations had been developed for a saturated zone site; when Yucca Mountain, an unsaturated zone site, was selected for characterization, only the Nuclear Regulatory Commission had amended its regulations to specifically allow disposal in the unsaturated zone. Further, following the amendment, Congress directed that the Environmental Protection Agency and the Nuclear Regulatory Commission promulgate site-specific regulations for the Yucca Mountain site. The fact that Congress was attempting to prevent disqualification of a site on the basis of a condition without appreciable health risk, and ensure protection of those most affected by the repository was lost in the reaction as unfair treatment of Nevada.