Low-Level Radioactive Waste Management in the United States: What Have We Wrought?

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ABSTRACT

In 1979, radioactive waste disposal was an important national issue. State governors were closing the gates on the existing low-level radioactive waste disposal sites and the ultimate disposition of spent fuel was undecided. A few years later, the United States Congress thought they had solved both problems by passing the Low-Level Radioactive Waste Policy Act of 1981, which established a network of regional compacts for low-level radioactive waste disposal, and by passing the Nuclear Waste Policy Act of 1982 to set out how a final resting place for high-level waste would be determined. Upon passage of the acts, State, Regional and Federal officials went to work.

Here we are some 30 years later with little to show for our combined effort. The envisioned national repository for high-level radioactive waste has not materialized. Efforts to develop the Yucca Mountain high-level radioactive waste disposal facility were abandoned after spending $13 billion on the failed project. Recently, the Blue Ribbon Commission on America's Nuclear Future issued its draft report that correctly concludes the existing policy toward high-level nuclear waste is "all but completely broken down." A couple of new low-level waste disposal facilities have opened since 1981, but neither were the result of efforts under the act. What the Act has done is interject a system of interstate compacts with a byzantine interstate import and export system to complicate the handling of low-level radioactive waste, with attendant costs.

As this paper is being written in the fourth-quarter of 2011, after 30 years of political and bureaucratic turmoil, a new comprehensive low-level waste disposal facility at Andrews Texas is approaching its initial operating date. The Yucca Mountain project might be completed or it might not. The US Nuclear Regulatory Commission is commencing a review of their 1981 volume reduction policy statement. The Department of Energy after 26 years has yet to figure out how to implement its obligations under the 1985 amendments to the Low-Level Radioactive Waste Policy Act.

But, the last three decades have not been a total loss. A great deal has been learned about radioactive waste disposal since 1979 and the efforts of the public and private sector have shaped and focused the work to be done in the future. So, this lecturer asks the question: "What have we wrought?" to which he provides his perspective and his recommendations for radioactive waste management policy for the next 30 years.

INTRODUCTION

In 1979, radioactive waste disposal was an important national issue. State governors were closing the gates on the existing low-level radioactive waste disposal sites and the ultimate disposition of spent fuel was undecided. A few years later, the United States Congress thought they had solved the problem by passing the Low-Level Radioactive Waste Policy Act of 1981, which directed that each state was responsible for disposing its own low-level radioactive waste. The law also provided that the states could establish a network of regional compacts for low-

level radioactive waste disposal. Compacts established pursuant to the Act and subsequently ratified by the US Congress could exclude waste produced outside of the compact. Upon passage of the acts, State, Regional and Federal officials went to work.

It didn't take long for the best-laid plans of the 1980 Act to fall apart. Congress took longer than expected to ratify the initial compacts. The selection of new disposal sites in the individual states ran into unexpectedly vicious pubic opposition. Compacts were soon mired down in expensive site selection programs.

To provide additional incentives to get the job done, Congress amended the Act in 1985 to establish milestones for action and to provide financial penalties for inaction. Most critically, Congress imposed a "take title" provision that required states to take possession of waste if they failed to achieve the milestones set out in the Act. In 1996, the US Supreme Court struck down the provision.

In the meantime, several independent states and regional "host" states began pursuing new disposal facilities. Four states, Texas Nebraska, California and Illinois, submitted applications to construct and operate new facilities. Only California was successful in this effort, but even that new facility failed to operate due to other factors. Ultimately, all the siting and licensing efforts failed. Texas alone embarked on a renewed effort to construct and operate a new disposal facility. That disposal facility will begin operating in early 2012.

Here we are some 30 years later with little to show for our combined effort. A couple of new low-level waste disposal facilities have opened since, but neither were the result of efforts under the act. A disposal facility at Clive Utah was opened in 1987 to provide disposal for naturally occurring radioactive material, a waste stream that was not even contemplated under the Policy Act. The Utah facility morphed over the years to a site that could provide disposal for bulk class A and containerized class A waste, but also for disposal of "11e(2)" byproduct material waste – i.e., mill tailings. It also provided an important facility for the disposal of mixed waste. The new facility at Andrews County, Texas, provides similar disposal options, but also provides the all-important disposal pathway for class B and C waste.

The Utah facility was developed outside of the compact system. The Texas facility was developed in spite of the compact system. In both cases, the regional compact system was not a catalyst for either facility. The other two operating facilities at Richland Washington and at Barnwell South Carolina were operating well before the implementation of the compact system. The facility at Barnwell stepped in and out of the compact constraints for several years before it was finally converted to a compact-only facility. Now, it limps along from year to year struggling to survive on a small waste input. Richland seems to be surviving, but only because the compact under which it operates has joined with another to create sufficient volume. And, it doesn't hurt that the Richland facility is the repository of choice for discrete Radium waste.

DISCUSSION

The purpose of the Low-Level Radioactive Waste Policy Act was to provide for more low-level radioactive waste disposal capacity and to distribute the obligation for disposal on a state or regional basis. Despite a great deal of effort on the part of dedicated individuals in both the public and private sector, not one new disposal site has been opened as a result of the Act. So, has the interstate low-level radioactive waste disposal compact system been a total failure? The answer is no.

Those who weren't around in 1981, when the Low-Level Radioactive Waste Disposal Act was enacted, probably don't appreciate that there was virtually no guidance on siting, operating, decommissioning, and closing a radioactive waste disposal facility. When the states began looking for places to build regional facilities, neither the federal nor the state government had promulgated rules for site selection and operation. No guidance documents existed. Little by little, new rules, techniques, guidance and methods came into existence. Over a period of a few years, the states, with the help of the federal government, worked out new site selection procedures, facility design parameters, and financial security mechanisms.

Site after site failed to be selected, almost exclusively due to political pressure resulting from public opposition. It soon became clear to state and compact officials that more attention to socioeconomics, public affairs, political process and media relations was required. The Department of Energy adjusted its support to address these important issues. Workshops dedicated to working with the media were organized, witness training was provided, and guidebooks on socioeconomic analysis and reporting were prepared.

The net effect of this was to shift the emphasis from finding the most technically suitable site to finding an adequate site with wide public support and some political acceptance. As the millennium drew to a close, so did the efforts by the states to build new disposal facilities. Waste generators, watching the state and compact programs from afar (and paying for most of them), soon realized that new disposal facilities were not going to be built any time soon.

As the uncertainty increased, so did disposal prices. When these price increases became exponential, waste minimization practices became more cost-effective. Thus, waste volumes fell precipitously in the two decades after the 1981 law was enacted. The urgent need for additional waste disposal capacity waned, as did the urgency for new disposal facilities. Several states and compacts suspended or terminated their site selection processes.

Will another disposal facility – compact or not -- ever be opened? The answer is no. Development of a disposal facility from start to finish takes far too long and costs far too much.

The most recent facility to open at Andrews Texas took 16 years and reportedly $500 million to complete, after an additional 16 years and $55 million were spent by the State of Texas on a failed effort to open its own facility. All the other projects, Nebraska, North Carolina, Pennsylvania, California, and Illinois, failed after almost $1 billion was spent trying to develop new sites. There is little doubt in this author's mind that anyone will ever successfully undertake to build another low-level waste disposal facility in this country.

Then there is the question of whether additional disposal capacity is actually necessary. Will the waste volumes in this country support more than two disposal facilities? Once again, the answer is no. Since 1979, waste volumes have declined precipitously. Waste management methods have improved and are still improving. Waste brokers and processors are employing methods not considered necessary 30 years ago when waste disposal costs were a mere fraction of what they are today. Nuclear utilities, the largest source of low-level waste, both by volume and radioactivity, are much more cautious about the generation and handling of their radioactive waste products. They have whole staffs whose sole purpose is to make decisions about waste processing and disposal options.

On the other hand, small generators, such as well logging operations, industrial facilities, medical facilities and universities, don't have the resources to support large waste management staffs. As the complexity and expense of handling small volumes of radioactive waste

increases, the regulatory burden imposed by the Act serves to make the management and disposal of radioactive waste more difficult for small generators.

There are occasional calls for amending or repealing the Low-Level Radioactive Waste Policy Act. None have been taken seriously.

Some support the continued compact system because they have a vested interest. Others like the political cover provided. Those who have to dispose of waste, and pay for it, are less enamored.

But, the last three decades have not been a total loss. A great deal has been learned about radioactive waste disposal since 1979 and the efforts of the public and private sector have shaped and focused the work to be done in the future. So, this lecturer asks the question: "What have we wrought?" to which he provides his recommendations for radioactive waste management policy for the next 30 years.

RECOMMENDATIONS

The purpose of the regional compact commissions should be reconsidered. It is no longer probable that the commissions will pursue new disposal facilities. It is no longer reasonable to believe that waste disposal responsibilities can be equitably distributed on a regional basis. Given these considerations, the following are recommended:

Own up to the Failure of the Regional Disposal System
One thing the difficulties and failures of the last 30 years have clearly shown is that, in the absence of a clear national mandate, low-level radioactive waste disposal on a regional basis is not possible.

Eliminate Obstructionist Policies of the Regional Compacts
Import and export restrictions should be eliminated or relaxed to reflect the realities of the actual disposal situation in the US.

Restructure the Purpose of the Compact Commissions
If the compact commissions cannot be discontinued, then they should be restructured. The commissions can be a catalyst for assisting waste generators in their respective regions to manage or dispose of waste.