

Low-Level Radioactive Waste Compacts:**RADWASTE REVISITED—1989**

By Jan. 1, 1992, states must have a license, and by Jan. 1, 1993, a functioning facility is to be open and accepting LLRW in all host states. A grace period is allowed to those states which have acted in good faith but have been unable to develop a site, but by Jan. 1, 1996, . . . the existing facilities have no further obligation to out-of-compact generators, and each state must take title to all LLRW generated within that state.

During the summer of 1988, much attention was focused on the environment. The drought and months of record-breaking heat raised the specter of the "greenhouse effect" that results from the combustion of fossil fuels and the defoliation of large areas of forest. Municipalities had an increasingly difficult time ridding themselves of solid wastes. A leading story, for the second year in a row, was the closing of some northeastern beaches because of potentially contaminated hospital trash washing in from the ocean. At long last, the American public is becoming aware that its garbage does not simply vanish once it is discarded.

Disposal of low-level radioactive waste (LLRW) has been an issue of importance to nuclear medicine for nearly ten years (1). The subject was discussed in *Newsline* four years ago (2) and progress to that point detailed. A great deal has transpired since then, and it is time to review what has—and has not—happened regarding this very complex and multifaceted topic.

One cannot discuss LLRW without viewing it in its larger context. Words such as "radioactive" and "nuclear" are charged and tend to produce a

very negative reaction in a significant percentage of the general public. "Trash" and "waste" assume equally malignant connotations, given the attention paid them this summer. Nonetheless, it is obvious that solutions based on objective science and technology, sound fiscal management, and sensitivity to the environment must be found for all waste streams. These solutions will not be easy to achieve.

History of LLRW Legislation

In January 1985, American generators of LLRW had one year to go before all three proprietary disposal sites were closed by authority of the Low Level Radioactive Waste Policy Act of 1980 (LLRWPA-80). Congress, in passing that act, had supposed that groups of contiguous states could easily work out a series of agreements among themselves in which one member (the host state) would site a new facility for the exclusive use of the members of that compact. Six or seven such compact regions would provide for economical and safe disposal of LLRW, removing the inequity perceived by the three existing host states (Washington, South Carolina, Nevada) and resolv-

ing some transportation issues as well. This simple and logical arrangement was not realized and, by 1985, not only were no new sites in place, none were even planned. Large generating states such as Pennsylvania, New York, Illinois, Michigan, Texas, and California were unaligned, and no compacts were ratified.

Because a stalemate was inevitable, and because the three host states could simply and legally close the existing sites, Rep. Morris K. Udall (D-AZ), chairman of the Subcommittee on Interior and Insular Affairs, began a series of negotiations aimed at forestalling an immediate crisis and ensuring that orderly and substantial progress would be made in the future in resolving the LLRW disposal issue. On Dec. 30, 1985, 36 hr before the deadline, LLRWPA-80 was amended (LLRWPA-85). Key provisions were:

1. The three existing sites were to remain open, accepting diminishing volumes of wastes until Jan. 1, 1993.
2. A series of milestones was established to ensure that each state was making systematic progress.
3. A system of financial penalties and surcharges was developed to make certain that no state dragged its feet.

4. The compacts involving the three current host states were to be ratified.

The milestones are rather specific and require that considerable work be done to meet them. By Jan. 1, 1986, each state was to have ratified a compact or declared its intent to develop a site. By Jan. 1, 1988, each host state was to have had a siting plan. By Jan. 1, 1990, a license application must be on file at the NRC or state agency in agreement states (which requires site specific information). By Jan. 1, 1992, states must have a license, and by Jan. 1, 1993, a functioning facility is to be open and accepting LLRW in all host states. A grace period is allowed to those host states which have acted in good faith but have been unable to develop a site, but by Jan. 1, 1996 (aptly called the "drop dead" date), the existing facilities have no further obligation to out-of-compact generators, and each state must take title to all LLRW generated within that state.

Economic Aspects of LLWR Legislation

This plan is expensive. The surcharge introduced in 1986 was \$10 per cubic foot. This rose to \$20 in 1988 and will go to \$40 in 1992. These surcharges are partially rebateable to states meeting the deadlines. The penalties, which are nonrefundable, amounted to \$20/ft³ in mid 1986, \$40/ft³ in January 1988, \$80/ft³ in June 1988, and will go to \$120/ft³ in 1992. Access may also be denied if a state clearly fails to show good faith in making progress.

Furthermore, volume allotments to states are dropping. Generators must find ways to reduce the volume of their LLRW. This requires preprocessing wastes, which adds to the expense of disposal. Even with volume reduction, the fixed costs of disposal do not change, increasing the cost per cubic foot. Thus, generators face a

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double jeopardy.

The cost of missing all deadlines after 1986 was calculated for Pennsylvania, which generated just over 190,000 ft³ of LLRW in 1986, (3) as being about \$83 million. It was pointed out by the antinuclear community that, spread over a population of 11.7 million, this amounted to \$7 per person. This statement ignores the fact that this figure involves only the cost of disposal, surcharges, and penalties, and does not include calculations of the economic impact on nearly 38,000 nuclear related jobs (4) and related products and services, or the fact that a site would still have to be developed.

The NRC adopted 10CFR61, the code of regulations which govern disposal of LLRW, in 1985, classifying LLRW into several categories. Class A wastes make up the greatest volume (98.6% in Pennsylvania in 1986) (3). Class B wastes (1.1% by volume in Pennsylvania in 1986) (3) have somewhat greater Curie content and longer half-lives. Class C wastes (0.8% by volume in Pennsylvania in 1986) (3) are highly radioactive and/or have very long half-lives. A large gap exists between Class C and high level

radioactive wastes (HLRW), which are defined as "greater than Class C" (GTCC). Wastes which are co-contaminated with hazardous agents as defined by EPA's Resource Conservation and Recovery Act (RCRA) are termed "mixed waste." GTCC and mixed wastes are currently orphans—no clear policy on their handling exists.

Variable Progress of LLRW Compacts

Since the adoption of LLRWPA-85, eight compacts have been ratified—the Appalachian States, Central, Central Midwest, Midwestern, Northeast, Northwest, Rocky Mountain, Southeast, and Southwest compacts. Several major generating states, such as New York, Texas, and Massachusetts, have opted to address LLRW disposal on their own. While several potentially suitable areas (PSAs) within those states have been identified, no specific sites have been chosen, let alone developed.

Progress in various regions has been mixed. California has identified a PSA in San Bernardino County, and has chosen US Ecology as its opera-

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tor. However, the environmental community has enjoined further progress, citing the fact that the PSA is near a migration pathway of the desert tortoise, a threatened species (whose survival also is affected by an interstate highway traversing the area).

Texas actually identified three PSAs several years ago, but ran into intense local opposition. A PSA in Hudspeth County, east of El Paso, was identified, but prompted introduction of HP3864 by Rep. Ronald Coleman (D-TX), which asked that further consideration be stopped because of a conflict with a US-Mexican agreement calling for mutual cooperation in reducing pollution in the Rio Grande Valley. That bill died in committee, stalling further progress.

Illinois has had two PSAs actually volunteer, both in the economically depressed southeastern part of the state. These sites and several others are under investigation by the designated contractor. While Illinois is seemingly in an enviable position, antinuclear sentiment seems to be on the rise locally.

Upon designation of Nebraska as host state of the Central Compact in 1988, Rep. Hal Daub (R-NE) introduced HR 453 aimed at forcing Congress to restudy the entire LLRW issue. It has not cleared committee. At any rate, Nebraska recently named US Ecology as an operator.

Pennsylvania, under strong leadership from the former governor Dick Thornburgh appeared to be heading toward responsible resolution of its LLRW problem, but progress has ground to a virtual halt. A great deal of work has gone into development of siting, technology, and licensing requirements, which seem close to being cast in regulation.

The implementing legislation, necessary to satisfy the Jan. 1, 1988 deadline, was passed in late January after a furious last minute effort that al-

Progress in NY State

New York State, which has elected a "go it alone" policy, has moved to identifying a site for low level radioactive waste disposal. At a public meeting in the state capital in December, the five member Low Level Radioactive Waste Siting Commission voted to accept a recommendation from its staff that identified 10 areas for further study as part of the site selection process.

The 10 areas, measuring 50-150 sq miles each, were identified based upon a computerized statewide analysis of exclusionary and preference criteria. Specifically, after excluding areas such as Federal and State parks, Indian reservations, primary aquifers and densely populated areas as required by federal and state law, the remainder of the state was rated square mile by square mile based upon preference criteria listed in state Department of Environmental Conservation regulations. These criteria include proximity to sources of waste and reliable transportation, geologic criteria, ground and surface water hydrology, climatic conditions, population density, and proximity to other specified areas.

After further screening of these candidate areas, eight potential sites will be identified for more substantive evaluation including limited on-site studies. Four candidate sites are projected to be selected for a one year detailed characterization in the autumn of 1989. The overall assessment of site suitability will include evaluation of various disposal methods. It will not include shallow land burial, which is precluded by statute in New York.

The New York State Low Level Radioactive Waste Siting Commission, was appointed by Governor Mario Cuomo in 1987. It consists of a nuclear medicine physician, an engineer, a health physicist, a geologist and an informed private citizen. Stanley J. Goldsmith, MD., Director of the Andre Meyer Department of Physics-Nuclear Medicine at the Mt. Sinai Medical Center in New York, and Past-President of The Society of Nuclear Medicine, is the physician member of the Commission. ■

lowed some poorly considered, disastrous inclusions to creep in. The most onerous is an unlimited liability clause for the operator. During 1988 two deadlines for submission of proposals passed without bidders. Subsequently, two bidders have stepped forward and submitted proposals, and the secretary of the Department of Environmental Resources is expected to choose an operator in late spring.

Obstacles to Site Development

Even in sited compacts, problems

exist. The Barnwell, South Carolina facility is scheduled to close at the end of 1992. The new host state, North Carolina, nearly left the compact when designated, but has selected contractors who were to recommend specific sites in December 1988. Bids are still being submitted. They face a difficult schedule in developing a site before Jan. 1, 1993.

The Beatty, Nevada site also is slated to close at the end of 1992. Colorado, the new Rocky Mountain host state, has identified six PSAs but has not made much more progress than

that. It too must have a functioning site as of Jan. 1, 1993. Only Washington state, host of the Northwest Compact, has a functioning facility that will continue to accept LLRW beyond 1993. This accounts for 7% of the LLRW generated in the United States.

The obstacles faced by the states in which the other 93% of LLRW is generated are generic. There is an undercurrent of fear and distrust of nuclear technology, exacerbated from time to time by events such as TMI and Chernobyl and accidents such as those that have occurred in Mexico and Brazil. The media in the United States has generally awakened to the necessity of resolving the LLRW issue, but a significant segment is fundamentally antinuclear. Elected officials are loathe to embrace the LLRW issue, since it is highly controversial and a potentially serious political liability. The antinuclear community, although fragmented and heterogeneous, has been able to capitalize on all of these facts and, in some cases, has been able to legitimately manipulate legislation and regulation to their advantage. Indeed, the antinuclear people were responsible for the liability provisions in Pennsylvania's law

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that have the process tied up in knots.

Probably the most important source of opposition comes from individuals who perceive themselves to be adversely affected by the siting of one of these facilities. Legitimate societal concerns about the impact on health providers, industry, the economy, and the availability of energy pale before the homeowner who believes his health and the equity in his home are threatened. All compacts have adopted provisions for the protection of such people, but acceptance has

often been grudging or non-existent.

The tasks of site selection, characterization, license application, and development are complex and will require several years to complete even in the absence of intervention through the political process. Prior to its failure to attract any bidder, Pennsylvania had projected an opening date of mid 1994 for its site. At this point, it seems extremely optimistic to assume that any new facility will be developed and operating by the legislated deadline of Jan. 1, 1993.

David R. Brill, MD

*Section of Nuclear Medicine
Geisinger Medical Center
Danville, PA*

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