

PROBLEMS OF A SINGLE (NON-COMPACT AFFILIATED) STATE IN LOW-LEVEL WASTE MANAGEMENT

John A. Mayer Jr., P.E., Chairman
Massachusetts Low-Level Radioactive Waste Management Board

ABSTRACT

The Commonwealth, formerly one of the major generating states, has one of the smallest staffs, lowest budgets, a late start, and is constantly prodded by the sited states. Yet, it is not that far behind others that have committed larger sums to date. This paper examines the manner in which the Commonwealth has addressed its responsibility to provide proper management of LLW, and in particular, the problem areas of compacting efforts and other negotiations, limited public awareness, implementation difficulties, waste minimization, and the uncertainty of generators.

INTRODUCTION

A decade has passed since the passage of the Low-Level Waste Policy Act of 1980 which assigned to the states the responsibility for low-level waste (LLW) management (1,2).

At first glance, the transfer was to be easily done: the states would form compacts, perhaps five or six, each responsible for the management of the LLW of the compact. The compact would select an initial host state that would site a waste facility for some period, then a second state would take on the responsibility for a facility, and so on.

It hasn't worked that way! At the present time there are not five, but over 15 separate jurisdictions, compacts and independent states, that must provide facilities for the ultimate management of their waste. Only three (California, Central States, and Central Midwest) have applied for a license to site a facility, meeting the 1992 milestone set by the 1985 amendments: many are far behind.

As a result of the increase in responsible jurisdictions, we find the nation in the absurd position of proliferating LLW sites: more than a dozen to handle a third of the waste volume formerly managed by three sites. And the technology to be employed will be far more costly. The impact upon the use of radiation technologies in all fields remains to be seen.

MASSACHUSETTS

LLW volumes have decreased dramatically since 1981, dropping from 300,000 to 56,000 cu.ft. per year in 1989, with further decreases to the 30,000 cu.ft range expected by 1993. Waste activity has shown a small decrease, dropping from 60,000 to 57,000 curies per year during the same period (3). Because of anticipated expansions in some uses of radioactive materials, particularly the biotechnology and research applications, activity is expected to rise. However, the major generators forecast continued improvement in waste volume minimization.

Massachusetts' LLW profile continues to be unique. The Commonwealth has over 400 licensed/registered users, of which 90 are generators. There are five operating reactors in the state, three at universities and two operated by utilities. The two power reactors generate about 40% of the state's LLW volume. One power reactor is approaching relicensing. Currently, it is not operating due to NRC concern over pressure vessel embrittlement. If the plant is not restarted and relicensed, the resulting decommissioning will have an earlier impact on the Commonwealth's waste burden. Decommissioning is already underway by the U.S. Army, which is dismantling a reactor in Watertown, Massachusetts

that was shut down and defueled in 1970. While the Army anticipates that the 7,500 cubic feet of resulting LLW will be completely removed by 1993, delays and decisions about permanent disposal could impact Massachusetts' waste responsibilities.

One of the state's largest generators is a metal fabricator which has been storing a half million pounds of depleted uranium and other materials in an outside lagoon. This storage location, one of three radioactively-contaminated sites on the state's hazardous cleanup list, raises serious concerns to the Commonwealth in light of the "take-title" and liability provisions of the federal Amendments Act.

One medical/research isotope producer generated 56,600 of the 57,200 total curies in the waste stream, 99% from the use of tritium.

Another group of LLW generators is the biotechnology industry, which has been attracted to the Commonwealth by the outstanding medical and educational research facilities available. This group anticipates that numerous new "biotech" firms will locate in the state, enhancing tax revenues, providing jobs, and solving medical problems through research. The state is actively encouraging new biotech companies to come to Massachusetts, and new businesses to expand. Along with the new jobs and state revenues resulting from this industry will come additional public concern about the expanded use of highly concentrated radioactive materials and their disposal through storage for decay or other regulated means. The state must provide appropriate public information to answer on-site storage concerns of local officials and residents.

PUBLIC AWARENESS

While public understanding of the uses of radioactive materials and the requirements for LLW disposal needs to improve, public awareness of old low-level waste disposal areas has increased. Magnesium alloyed with thorium was buried in North Grafton in the sixties, uranium and thorium oxides buried in the seventies now lie under an I-190 ramp in Worcester, radium and uranium was buried in North Attleboro and Norton, and medical waste was buried in Southboro. Congress and the Environmental Protection Agency are currently examining the dumping of wastes, including radioactive wastes, in Massachusetts Bay for the thirty years following World War II. Sensitized by these issues, it is not surprising that Massachusetts citizens responded negatively to the "Below Regulatory Concern (BRC)" proposal announced by the Nuclear Regulatory Commission. Town meetings and legislative activities brought bans on BRC materials in landfills across the state. Even though state law prohibits the

disposal in local landfills of LLW, including waste which may be identified as BRC waste, town meetings and state legislators proposed additional bans on BRC materials, and suspicion of NRC motives increased. Because Massachusetts is not an agreement state (though preparations are underway to petition for such status), the public's questions about NRC actions have heightened public anxiety about the state's LLW management activities.

COMPACTING

A decade ago the Commonwealth, consistently one of the top five generators of LLW in the nation, charged the Special Legislative Commission on Low-Level Radioactive Waste with the assessment of the generation and management of LLW in the state; the formation of a regional compact for LLW management; and the development of a comprehensive process for siting a LLW facility in Massachusetts. Concurrently, the Coalition of Northeastern Governors (CONEG) drafted a "Northeast Compact" agreement for action by the eleven states that comprised the Coalition. CONEG anticipated bringing a final compact document to the individual state legislatures in 1983 (4).

However, in 1982, Massachusetts voters approved a referendum that prohibits construction of any nuclear power plant or waste disposal facility in the state unless the legislature determines that the facility is superior (or optimum) in regards to cost, safety, environmental impact, reliability, land-use planning, and avoiding social and economic dislocation. In addition, the facility must be certified by the Legislature and approved by the voters in a state-wide general election (5). This Act raised concerns in the other CONEG states, but the discussions continued. Subsequently, the Massachusetts Supreme Judicial Court, responding to a Senate request, delivered an opinion that the act was unconstitutional. As the act has not been challenged, it remains on the books.

The Commonwealth and several of the other states involved proposed amendments to the CONEG compact due to concerns regarding the host state and liability protections. Further negotiations failed to produce a compact, and shortly after Pennsylvania, West Virginia, Delaware, and Maryland joined the Appalachian Compact, New Jersey and Connecticut formed the Northeast Compact, and the remaining CONEG states went their separate ways.

The Northeast states, which comprise a regional block of individual states plus the Northeast Compact states of New Jersey and Connecticut, began to meet together again in 1991. The discussions may result in some interesting and innovative approaches to common siting problems. Besides talks about a possible New England Compact, the group is discussing whether benefits exist in sharing facilities for other types of waste in addition to LLW, such as hazardous and solid waste, in an effort to regionalize a total waste management system and spread the burden of such a system throughout the region. It is encouraging to see the northeastern states earnestly discussing these issues.

NEGOTIATIONS WITH OTHER STATES

For the past two years the Commonwealth has pursued a dual track policy that concurrently continues negotiations with other states while moving forward with Phase I activities of the state's LLW management law (i.e., preparing all necessary state regulations to site, license, operate and close LLW

storage, treatment and disposal facilities; regulations for source and volume minimization and selecting facility operators). Negotiations cover four areas: joining a compact as a non-host member; joining a compact as a second host state; establishing a new compact; short and long term contracts to accept Massachusetts's waste; and arranging the availability of out-of-state storage and treatment facilities. Not surprising, discussions with established compacts indicate no interest in accepting the Commonwealth's waste on a contractual basis or allowing Massachusetts to join as a compact member on an equal basis with other non-host members, unless the Commonwealth agrees to develop the first regional disposal site.

On the other hand, the Commonwealth believes that some host states will see the economic benefit of accepting additional LLW from outside at a premium rate. The first indication has already occurred: South Carolina Gov. Campbell's December speculation about a differential rate structure for interim use of the Barnwell facility has been greeted with favorable interest in Massachusetts.

In response to the impending loss of access on January 1, 1993 for those states and compacts not able to provide disposal capacity for their generators, the Low-Level Radioactive Waste Management Board has confirmed the ability of generators to hold waste for short-term storage in the post-1993 period. Responses received on surveys indicate that all but a few have the ability to store on site. Follow-up discussions and personal interviews will be used to confirm the on-site storage preparations.

IMPLEMENTATION

State law provides detailed requirements for managing LLW and developing a storage, treatment, or disposal facility, if necessary (6). A decision to site a facility may be made by the Low-Level Radioactive Waste Management Board only after all regulations have been developed, brought to public hearings, and adopted. In addition, a facility must be shown to be in the best interests of the Commonwealth.

The Act was constructed to ensure that the state agencies involved would work with the public to attain the greatest protection of public health, safety, and the environment. Public participation in the process is sought, encouraged, and demanded in every phase, of management, not just siting if that decision is made.

The Commonwealth is near the completion of Phase I of the law, which requires completion of the planning for all subsequent storage, treatment, and disposal (STD) activities, and development of policies and regulations to implement those plans. Major elements are: development of a Management Plan on LLW policy, with accompanying regulations; regulations establishing environmental criteria for identifying facility sites; regulations on STD facilities, including licensure, development, operation, closure, post-closure observation and maintenance, and institutional control; regulations establishing the criteria for STD operators; and waste minimization regulations fulfilling the statutory requirements that all generators of LLW must reduce their LLW activity as well as their waste volumes to the greatest extent practicable.

Phase I activities conclude with the adoption of the above regulations following a minimum of six consolidated hearings across the state. Responsibility for the Management Plan and all LLW regulations falls on three state agencies: the Low-Level Radioactive Waste Management Board, the

Department of Public Health, and the Department of Environmental Protection. It is only after this prescribed process, with its inter-agency coordination and extensive public participation process that the Commonwealth can make a decision on siting or any other long-term solution.

The Massachusetts LLW law anticipated that the funding for LLW management, including facility siting (if necessary), would be by state appropriation. The activities of the Management Board, Public Health, and Environmental protection departments were to be funded from the annual state appropriation budget; if siting occurred, the costs of site identification would come from funds borrowed for that purpose (i.e., a capital bond authorization).

Funds have been appropriated by the Legislature at various levels for all three agencies with LLW-related responsibilities. In more recent years, the necessity to make fiscal reductions, due to the effects of the national recession on the state's economy, has impacted funds for LLW management as well as every other program within state government. The Legislature authorized the Management Board to assess all radioactive materials users and LLW generators using a formula involving volume and "classification of radioactivity" to raise up to \$500,000 for this and subsequent years. This money will help pay some of the administrative operations of the Board.

Bonded funds to cover the costs of site identification work, if necessary, will be requested from the Legislature.

Funding limitations have also limited the staff available to address LLW management issues. The result: all involved state agencies have incurred delays in completing their responsibilities under Phase I of the state's LLW management law.

Because the process involved in reaching a decision on the long-term management of LLW is so different from other states, i.e., no automatic decision to site a disposal facility within the Commonwealth, but rather an assessment of the generator's long-term needs relative to the LLW activities of the nation as a whole, there is a perception from the outside that no forward movement is being made. The reality, however, is that progress has occurred; the state has made significant strides on several LLW management issues, and despite the initial implementation difficulties, is better prepared to meet the challenges of the post-1996 era.

WASTE MINIMIZATION

One of the successes of the Massachusetts LLW management efforts is the development of a program of source and volume minimization. State law requires radioactive materials users to "prepare and implement" plans for the utilization of all appropriate source minimization, volume minimization, and storage for decay methods. The Management Board met its obligations by submitting recommendations for a minimization program to the Department of Public Health. That agency has developed the necessary regulations, and will institute the program with the authorization of Agreement State status.

Waste reduction is often considered the "double-edged sword" of LLW management policy. On the one hand, minimizing sources and waste volumes can reduce the costs of storage, ensure less worker exposure, and lower the possibility of waste leading to environmental or public health damage. The other edge of the sword, however, is the increase in

disposal costs which can occur if fewer waste management fees are available to offset the costs of operation and liability. Balancing the positive effects of minimization efforts with the economics of long-term disposal is a problem being addressed by the Commonwealth.

Another waste minimization problem is due to the lack of treatment facility capacity to reduce waste volumes in Massachusetts. Two treatment operations which existed before the state LLW management law (and are therefore not "facilities" as defined by the state's management system), process medical waste through incineration, and treat contaminated utility clothing through laundering.

Currently, most Massachusetts waste is processed out-of-state. Efforts to encourage waste minimization after disposal facilities are closed has been addressed in the adoption of a re-admittance policy. Some states and compact regions are considering limitations on the use of the private treatment enterprises in their jurisdictions. Massachusetts is preparing legislation to seek approval from the Illinois Legislature, through the Midwest Compact Commission, for the use of its processing firms. Other states may impose limitations on treatment, with short notice and little opportunity to find alternative solutions.

GENERATOR UNCERTAINTY

The various types of generators in Massachusetts -- commercial, utility, health care, educational, and government -- are not organized into one group with a single voice on LLW management issues. One group speaks for the major generators, i.e., the utilities and large commercial radioactive materials users. Another group represents the biotechnology industry; still another represents hospitals. There is no "academic" group actively involved in LLW issues, nor is there an organization to speak for the unique problems of sealed source users.

The variety of radioactive materials user and generator groups has produced a mixture of perspectives about the long-term solutions for LLW management required in Massachusetts. Some generators view the state law only as a siting instrument, and question the economics of selecting a Massachusetts-only disposal siting option. Others believe an opportunity exists for Massachusetts to serve as the host to a small regional compact, and thereby receive funds from out-of-state generators to help subsidize long-term disposal costs.

Some are pressing to have Congress re-open the federal Amendments Act; others want the federal government to pick a national site. Others may view the 1996 deadline and the "take-title" and "liability" provisions of the federal LLW Act as a mechanism to force the state to take their waste. The difference in their approaches to the state's management solutions is another problem for the Management Board, charged with the responsibility of involving the public -- including all generators -- in the LLW decision-making process.

SUMMARY

Massachusetts has focussed its LLW management activities on the formation of a solid statutory and regulatory base which will provide the framework for arriving at a solution that will be in the best long-term interests of the Commonwealth. As the country approaches the 1996 deadline of the federal LLW Policy Act, Massachusetts has retained the ability to

take advantage of the opportunities that will arise from the current proliferation of sites.

REFERENCES

1. "Low-Level Radioactive Waste Policy Act", P.L. 96-573, 1980.
2. "Low-Level Radioactive Waste Policy Amendments Act", P.L. 99-240, 1986.
3. "1990 Massachusetts Low-Level Radioactive Waste Survey Report", Massachusetts Low-Level Radioactive Waste Management Board, November, 1991.
4. "Low-Level Radioactive Waste in the Northeast: Report to the States", CONEG, March 1983.
5. "Nuclear Power and Waste Disposal Voter Approval and Legislative Certification Act", Massachusetts General Laws c. 164, 1982.
6. "Low-Level Radioactive Waste Management Act", Massachusetts General Laws c. 111H, 1987.
7. "Radioactive Waste Management Fund Act", Massachusetts General Laws c. 138, section 166, 1991.