

U.S. POLICY ON LOW-LEVEL RADIOACTIVE WASTE CHALLENGED

Is the nation's low-level waste law capable of fostering a practical solution to the problem of safe, efficient disposal?

NUCLEAR POWER PLANTS, research labs, and hospitals are facing bewildering uncertainties in dealing with radioactive waste, more so than at any time since Congress amended the Low-Level Radioactive Policy Act in 1985. In the wake of a Supreme Court ruling that struck down part of the waste act in June, the U.S. Senate adopted a resolution urging Congress and the states to "reexamine" the law. The Senate cited evidence that far too many disposal facilities were on the drawing boards given the declining volume of waste. The House of Representatives dropped the resolution on low-level waste, but questions raised by the Senate about whether the nation's low-level waste law is capable of fostering a practical solution remain unanswered.

No state has actually started building a new facility. The nation's three existing disposal sites will restrict access or close altogether at the end of this month, so universities, hospitals, and drug companies are making preparations to store and decay low-level radioactive wastes for the next five years or longer—creating thousands of de facto waste depots across the country.

"I believe it is critical for the Congress to reopen the 1985 law," Sen. Robert Kerrey of Nebraska told his fellow lawmakers in July. Sen. Kerrey sponsored the sense-of-the-Senate amendment to urge Congress, the National Governors' Association, and the Department of Energy to reexamine the Low-Level Radioactive Waste Policy Act. But radioactive waste generators led by the nuclear power industry dis-



Containers of low-level radioactive waste awaiting shallow land burial at the Beatty, Nevada disposal site, which is due to close on December 31. All but two of the proposed new repositories will eschew shallow land burial in favor of engineered disposal vaults.

miss the idea of tinkering with the existing framework for waste disposal, arguing that attempts to change the law would undermine years of work and millions of dollars already spent by states to develop disposal facilities.

The Society of Nuclear Medicine and the American College of Nuclear Physicians have advocated the federal waste law in several arenas, including the Supreme Court, and recently in a suit against California urging a licensing decision on the low-level waste facility planned for that state. "The Society is in favor of states handling their own wastes," says SNM President Paul

H. Murphy, PhD, of St. Luke's Episcopal Hospital in Houston, Texas. "To reverse that law and to begin anew developing a few national waste facilities could put hospitals in the business of long-term storage of radioactive waste for years to come."

"If Congress reconsidered the act, there's no telling what could happen," says Felix M. Killar, Jr., director of nuclear programs with the U.S. Council for Energy Awareness, the public relations arm of the nuclear power industry. The industry anticipates that citizen's groups would seize the opportunity to erect further roadblocks

against waste facilities. Sen. Kerrey and the seven other senators who co-sponsored the measure say they are not motivated by anti-nuclear sentiments. Quick to praise the importance of nuclear technology, their concerns about too many sites are shared by many in nuclear medicine, science, and industry. Advocates of Kerrey's position say that changing the law now could save businesses and consumers billions of dollars.

Waste Volume is Declining

When Congress enacted the federal waste act in 1980, nuclear power plants, research labs, hospitals and other industries generated 3.4 million cubic feet of low-level radioactive waste, according to the DOE. But the volume of waste shipped for disposal each year has declined dramatically since then because of escalating disposal charges written into the law. Disposal sites received less than 1.4 million cubic feet in 1991. Disposal costs have risen, mostly due to surcharges, from about \$60 per cubic foot in 1985 to some \$300 per cubic foot proposed by the Southeast Compact for the Barnwell, South Carolina site—the only disposal option for most of the country after New Year's Day.

The Office of Technology Assessment estimated in 1989 that the country would need at most six waste facilities and some health physicists say that the existing three could continue handling the nation's low-level wastes indefinitely. As the states are aligned now, some dozen highly engineered disposal facilities would be built.

By sticking with the existing compact system, "we are bound to waste a lot more money and we are not going to gain a solution that enhances environmental protection," says Ron Kucera, the acting director of the Missouri Department of Natural Resources. Mr. Kucera and Missouri Governor John D. Ashcroft want Congress to scrap the low-level waste policy act in favor of a more federally directed plan, but Mr. Kucera

What to Expect Amid Uncertainties of Low-Level Waste Disposal

The Barnwell, South Carolina disposal site plans to accept waste from most states from January 1, 1992 until June 30, 1994. But because of stiff surcharges proposed for the site, and the fact that the access will last for only 18 months, many research laboratories and hospitals have no real choice but to build expensive on-site storage and curtail experiments that use long-lived radioactive isotopes.

The Southeast Compact Commission plans to raise surcharges to at least \$220/ft³ for out-of-compact waste shipped to Barnwell starting New Year's Day. Some of the money from these fees will go toward a Southeast Compact contingency fund, while \$160 million will be paid to South Carolina as required by state law, and \$30.8 million will go to North Carolina for work on a new waste facility. The disposal costs charged by the waste handling company, Chem-Nuclear Systems, will add another \$50/ft³ to the total, making Barnwell a remarkably expensive way for industries to get rid of low-level radioactive waste.

The Southeast Compact plans to require large waste producers (greater than 1000 ft³/year) to pay surcharges upfront in quarterly installments based on the estimated total to be disposed over the 18 month period that Barnwell will remain open. The compact came up with this scheme to stabilize cash flow in light of expected low disposal volumes in 1993. If South Carolina fails to raise the revenue expected from continuing to operate Barnwell, the compact will face mounting political pressure within the state to close the site.

The State of South Carolina and the Southeast Compact have warned that states or compacts that fail to make progress in developing new disposal sites will lose access to Barnwell. Michigan, New Hampshire, Rhode Island, Puerto Rico, and Washington, DC, have already lost access to Barnwell and the other two waste sites in the U.S.

The Northwest Interstate Compact on Low-Level Radioactive Waste Management agreed in July to accept waste from the member states of the Rocky Mountain Low-Level Radioactive Waste Compact from January 1, 1993 until closure of the Hanford waste disposal site. The Northwest Compact comprises Washington, Oregon, Idaho, Montana, Utah, Hawaii, Alaska, and Wyoming, which switched from the Rocky Mountain Compact in March. Until this year, Rocky Mountain states shipped waste to Beatty, Nevada for disposal, but the site will stop accepting waste at year's end. The Northwest Compact stipulated volume limits and additional fees for waste from the Rocky Mountain states of Colorado, New Mexico, and Nevada. The proposed fees are \$50/ft³ for non-reactor waste and \$100 / ft³ for reactor waste to be paid to Washington until Rocky Mountain payments reach \$3.5 million. The agreement provides for disposal capacity for eleven states that together account for less than a tenth of the volume of low-level waste generated in the U.S.

admittedly sees little chance of that happening anytime soon.

Facilities Slow in Coming

The original waste act, which Congress modified in 1985, made each state responsible for disposal of its own low-level wastes, independently or in a compact with other states. The law was intended to distribute the burden of waste disposal that is still borne by the three states with the nation's only low-level waste facilities, Nevada, South Carolina, and Washington. The so-called "take-title" provision struck down by the Supreme Court would have forced states to assume possession of wastes and legal liability if they failed to have disposal

capacity by 1996.

"Clearly, without the take-title provision, the likelihood of having low-level waste disposal facilities is less certain," Nuclear Regulatory Commissioner Forrest J. Remick told an industry group in September. Many states and compacts continue the slow process of planning low-level radioactive waste facilities—and getting people to accept them. But efforts in general have bogged down.

Because of the Supreme Court ruling, Sen. Kerrey contends that "most states are sitting quietly waiting for the others to first cross the line and license a new facility before proclaiming the compact system unworkable." Since Nebraska is expected to be a

Dimensions of the U.S. Radioactive Waste Problem

- Portion of U.S. low-level waste from nuclear power plants by volume: **56.2%**
- Portion from medical centers, universities, and hospitals: **6.3%**
- Cubic feet of U.S. low-level radioactive waste shipped in 1980: **3.4 million**
- Cubic feet of low-level radioactive waste shipped in 1991: **1.14 million**
- Number of states or compacts in the U.S. planning new waste sites: **13**
- Proposed sites that applied for a license by the January 1, 1992 deadline: **3**
- Number of states or compacts that have been granted a license: **0**
- Number of new waste facilities ready for the January 1, 1993 deadline: **0**
- Surcharge per cubic foot of low-level waste before 1986: **\$10**
- Surcharge per cubic foot proposed by Barnwell after 1992: **\$220**
- Number of states or jurisdictions with no access to a low-level waste site: **5**

trailblazer, people there now worry about being “anointed” as hosts of a national waste facility, as Graham Chisholm, one of the senator’s staff members put it. “That was not in the original bargain,” he says, “and would be a real violation of trust.” As governor of Nebraska in 1983, Mr. Kerrey signed the legislation that made Nebraska host state for a waste facility.

Just how likely it is that the states would abandon the compact system is debatable. The Supreme Court decision upheld the basic structure of the waste act, so most users of radioactive material keep investing faith (and money) in the law to provide an eventual solution.

Not in My Backyard

“There are states that have spent almost ten years responding to the Low-Level Radioactive Waste Policy Act—the citizens of those states made a clear statement [whether] they didn’t want to be with other states or wanted to be in a compact,” says John R. Vincenti, executive secretary of the Appalachian Compact Users of Radioactive Isotopes (ACURI), a Pennsylvania-based association for industries that produce radioactive waste. “To stop the programs in Nebraska, California, or Pennsylvania would be unconscionable,” says Mr. Vincenti.

He is not alone in accusing those in favor of amending the low-level waste act of NIMBYism. “The states that want to change the law are the states that don’t want [low-level waste] in their backyard,” he says.

Aside from Nebraska Senators Kerrey and J. James Exon, the lawmakers who co-sponsored the resolution to reconsider the act happen to represent three states where waste-siting efforts are floundering: Connecticut, Michigan, and New York. In the home state of Connecticut Senators Joe Lieberman, and Christopher J. Dodd, officials scrapped several years worth of waste-siting efforts earlier this year and started over. Michigan Senators Donald W. Riegle, Jr. and Carl Levin represent a state that was booted from the Midwest Compact and is one of the few states denied access to existing waste facilities. In Sen. Daniel Patrick Moynihan’s New York, bitter opposition to the proposed low-level waste sites led the state to battle the law all the way to the Supreme Court.

Politics aside, consolidation of the low-level waste compacts is crucial to every industry that uses nuclear material. Locating and building a single new waste site is estimated to cost about \$100 million. If each of the nine existing compacts and handful of solo

states build waste facilities, the industries that generate waste would have to absorb an astronomical expense. Hardest hit by rising costs for disposal would be biomedical laboratories, universities, drug companies, and other research enterprises with limited storage capacity and lesser ability to pass costs to consumers than the electric utilities. Low-level waste disposal costs are expected to make electricity, pharmaceuticals, medical services, and everything else that involves use of nuclear materials more expensive. In academic labs, the money spent on waste storage is sure to reduce the resources available for research.

USCEA’s Mr. Killar maintains that the low-level waste act allows states and compacts to further band together to consolidate waste disposal. He acknowledges concerns about the excess number of waste sites currently planned under the compact system. But proponents of the current system expect considerable consolidation among the compacts. In July, the seven-state Northwest Interstate Compact on Low Level Radioactive Waste Management agreed to accept waste at the Hanford, Washington site from the four states of the Rocky Mountain Low-Level Waste Compact. Texas, a go-it-alone state, is on schedule to open a waste facility by 1996 and state officials are negotiating to accept low-level waste from a few other states. “As more sites get up and operating and begin to assess costs, there will be more willingness to open compacts and compacts will combine into bigger units,” Mr. Killar says.

Sufficient consolidation is unlikely to happen, contends Mr. Kucera, the Missouri state official. “It’s too much for the states to handle,” he says. “We need to have Congress put an end to this highly dysfunctional system.” Mr. Kucera derides the current structure as little more than a “money machine” for low-level waste bureaucracies and consulting firms. “They all want the process to continue and they provide most of the testimony to Congress,” he

says. As an example of the system's failure, he points to the recent decision by a review panel in Illinois disqualifying the chosen site for a low-level waste facility—after the two-state compact had spent over \$80 million. "The whole effort is a failed policy," said Mr. Kucera.

The overhaul plan proposed to Congress by Mr. Kucera and the Missouri governor would repeal the 1985 waste law and dissolve the existing compacts. (Missouri is a member of the Midwest Compact for which Ohio is set to host a waste facility.) The plan would amend the Atomic Energy Act to give authority over low-level waste exclusively to the Nuclear Regulatory Commission, but freeze the definition of low-level waste as in the 1985 act to put states at ease about "below regulatory concern" measures, which state and local regulators vehemently oppose. (Responsibility for all but class A low-level waste would go to the DOE.) The Missouri proposal would cap disposal surcharges at \$40 per cubic foot, half of which would be earmarked for refunds to states that spent money complying with the 1985 law. Mr. Kucera says the plan would limit the number of sites needed and save biomedical research enterprise millions of dollars, but says Congress has no "political will" to even consider such an amendment.

Expecting no help from Congress, some groups have approached the state governors. The Council of Scientific Society Presidents has appealed with little success to the governors of South Carolina, Washington, and Nevada to keep the existing waste facilities open to the whole country. Janis D. Stelluto, executive director of NELRAD, a consortium of New England radioactive materials users, believes that the solution lies with the governors. She says Congress need not repeal the waste act, but rather the governors should work toward consolidating the low-level waste compacts. The compacts have become "bureaucratic fiefdoms" that divert responsibility from the gov-

ernors, Ms. Stelluto says. Sen. Kerrey echoed this concern, saying that voters "do not elect members to the compact and they feel disconnected as a consequence."

For their part, the governors have been none too eager to revisit the quagmire of low-level waste disposal. The National Governors' Association has distinctly rejected suggestions of altering the Low-Level Radioactive Waste Policy Act, which they helped to draft. "We do not believe that at this time a consensus exists among the governors to call for a reexamination of the act," wrote NGA Chairman and Colorado Governor Roy Romer and colleagues in a September 23 letter to Sen. Kerrey. A "natural consolidation" in the number of planned low-level waste repositories is likely to occur, the governors said, adding that they "see no obstacles to such consolidation in the current law, as the states are free to associate in compact by mutual agreement."

The governors' letter went on to praise the low-level waste law, which has cost the nation hundreds of millions of dollars without developing even one new facility. The governors wrote that "the absence of federal coercion as to the number of sites and the membership in compacts remains one of the principle virtues of the low-level waste legislation."

While the Low-Level Radioactive Waste Policy Act has yet to provide workable solutions and some would argue that the law is putting the country on the wrong course, that course is unlikely to change soon. Congress, the state governors, and most waste generators seem to agree that going back to the law might create even more problems than it would solve. "This is a vicious cycle, we're not coming to a resolution, and now we're creating new problems," comments Mr. Vincenti of ACURI, who favors letting the law alone. "We already could have built a Taj Majal of waste disposal facilities, and what do we have?"

J. Rojas-Burke

Going Critical

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tions in November 1943. Despite the secrecy of the Manhattan Project during the war, Oak Ridge sent radio-phosphorus for cancer therapy around the country via the University of California at Berkeley, under the pretense that the material came from cyclotrons.

After the war, newspapers were free to report what was going on in Tennessee and one headline referring to therapy with iodine-131 proclaimed: "Cancer Cure found in the Fiery Canyons of Death at Oak Ridge." Enthusiastic physicians told medical students that within a decade nuclear medicine would make cancer a thing of the past. In a similar spirit, the U.S. government's "Atoms for Peace" campaign promised "undreamed of progress" through nuclear energy.

The nuclear era has failed, to say the least, to live up to the hype. The technological snags and economic considerations that continue to hamstring nuclear power were already problems in the 1960s. Although nuclear medicine is a mainstay of modern medicine, therapies using radiation have fallen decidedly short of miraculous. Nuclear technology has become for many a source of deeply rooted fear.

Technologies using radioactivity may not have created utopia but they are quietly settling into the contemporary world we comfortably take for granted. Radiography is used in materials testing for everything from soup cans to jet engines. If not used to generate electricity, radioactivity is used to map contours of wells drilled for oil and natural gas. Such common consumer products as smoke detectors, shrink wrap, and copy machines, rely at least in part on radioisotopes.

In the fifty years since the control of nuclear energy, the Cold War has come and gone, and perhaps the threat of nuclear destruction is receding. Will it yet be possible for society to come to terms with the dread that its indispensable technology inspires?