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Nuclear Waste Disposal: A Federal and State Problem

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NUCLEAR WASTE DISPOSAL: A FEDERAL AND STATE PROBLEM

INTRODUCTION

In November, 1976, the Kentucky Environmental Quality Commission closed the radioactive waste disposal site at Maxey Flats, Kentucky, "until the public can be assured that it is creating no serious health defects."[1] This decision comes after 14 years of radioactive waste burial at that site by the Nuclear Engineering Company located in Pleaston, California.[2] During the first 11 years of operation alone, over 5,000,000 cubic feet of solid waste and 500,000 gallons of liquid waste were buried at Maxey Flats.[3]

Concern about the hazards of radioactive materials is, of course, not new. Contrary to the history of many other potentially hazardous substances which man's technological growth has added to the environment, the dangers of radiation were recognized immediately. Stringent standards were established at the outset by the Manhattan Project and subsequent controls have been established for the handling of radioactive materials and the discharge of radioactive wastes into the environment.[4] These controls have resulted in a practically unblemished health and safety record, unparalleled by any other industry.[5] However, past success in containing radioactive mate-

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[1] Louisville Courier-Journal, Nov. 18, 1976, at 1, col. 1.

[2] In 1960, the Atomic Energy Commission (AEC) announced that it would allow private industry to bury their "low-level" radioactive waste at AEC facilities. Later, the AEC said it would allow such burials on state-owned lands. The first private company to respond to the AEC request for private industry participation in waste burial operations was the Nuclear Engineering Company (NECO).

In mid-1962, the NECO operation undertook a study to determine the suitability of a plot of land located in Fleming County in northeastern Kentucky for burial of radioactive wastes. On the basis of a 10-day study by a geologist, NECO found the site to be suitable. In January, 1963, NECO leased this 330-acre tract of land known as Maxey Flats from the State of Kentucky for a period of 25 years, with an option to renew the lease for another 25 years. J. Thomas, Evaluation of the Maxey Flats Radioactive Waste Disposal Site (1974) (unpublished M.S. thesis in University of Kentucky Engineering Library).

[3] *Id.* at 16.

[4] Pittman, Management of Commercial High-Level Radioactive Waste (paper presented at M.I.T. July 25, 1972).

[5] As of 1963, only six United States fatalities had been documented involving radiation or nuclear reactors. Thompson, *Nuclear Reactor Function and Operation,* in

rials has provided little comfort to many concerned scientists and environmentalists, who feel the United States is committing itself to an irrevocable reliance on nuclear power without sufficient recognition of potentially catastrophic problems.[6] One of these problems is radioactive waste—where to put it and how to make sure it stays there until it is no longer dangerous.

This Comment deals with the complex problems associated with radioactive waste management. Specifically, this paper examines and evaluates the more prevalent means of radioactive waste disposal. Particular focus is placed upon the regulatory aspects of radioactive waste management and the propriety and desirability of greater state participation in a federally-dominated area.

I. BACKGROUND

An exiled Russian scientist recently disclosed that approximately 20 years ago, an earthquake-triggered nuclear accident killed hundreds of people in his homeland and left thousands more seriously ill.[7] United States sources speculate that the tremors may have toppled over and cracked open dozens of huge tanks above and below ground that were used to store the liquid radioactive wastes of Soviet plutonium factories.[8]

Although the fear of exposure to radiation is relatively new, exposure itself is not. The earth's environment has always been exposed to radiation from the decay of various radioactive materials in the earth's crust and from extraterrestrial sources, such as cosmic rays from the sun.[9] It was not, however, until

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NUCLEAR ENERGY, PUBLIC POLICY AND THE LAW 34, 41 (E. Bloustein ed. 1964).

[6] *See* UNION OF CONCERNED SCIENTISTS, THE NUCLEAR FUEL CYCLE: A SURVEY OF THE PUBLIC HEALTH, ENVIRONMENTAL, AND NATIONAL SECURITY EFFECTS OF NUCLEAR POWER (1975) [hereinafter cited as THE NUCLEAR FUEL CYCLE]. Following the release of an official United States Atomic Energy Commission assessment of the hazards associated with the handling of nuclear materials, published in November, 1972, the Union of Concerned Scientists (UCS) initiated an independent, parallel study intended to illuminate defects and important omissions in the AEC survey. The UCS reported that the mismanagement of the United States nuclear power program had become so pervasive that there were serious questions as to whether the nation can, in fact, manage such a technology with the required care. *Id.*

[7] Louisville Courier-Journal & Times, Nov. 21, 1976, § B, at 6, col. 3.

[8] *Id.*

[9] Pittman, *supra* note 4, at 1.

the late 1930's that man was able to produce very large amounts of radiation and radioactive materials.[10] In learning to release energy in a controlled manner from the splitting of certain atoms, man discovered a potentially lethal problem—managing the waste by-products.

II. DISPOSAL OF RADIOACTIVE WASTE

In considering the problem of radioactive waste disposal, it is necessary to distinguish between "high-level" and "low-level" radioactive waste. High-level waste refers to the materials (fission products and actinides)[11] produced during the reprocessing of the spent-fuel elements from nucler reactors and from the manufacture of atomic weapons.[12] Because of its radioactive longevity, biological risks, and concentration of radionuclides, this type of waste must be perpetually isolated from the biosphere.[13] Low-level waste refers to items contaminated by radioactivity in nuclear operations.[14] The problem of disposal of low-level waste lies not so much in the amounts of radioactivity, which are small compared to those arising directly from fuel reprocessing, but rather in their large volume and varied form.

A. *Present Disposal Techniques*

> Every time radioactive waste is dumped into a stream, buried, dropped into the ocean, discharged into the air, or otherwise released from human control, it passes into the complex world of living things. It will pass from living thing to living thing, sometimes being concentrated, at other times being dispersed, with an efficiency and ingenuity which man

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[10] *Id.* at 2.

[11] The fundamental process by which energy is produced in a nuclear reactor is the fission of heavy atoms (uranium and plutonium) called fission materials. In addition to the release of large amounts of energy, the fission process produces an average of 2 1/2 neutrons, and two or more fission product atoms which are usually radioactive. Both of these reaction by-products contribute to the potential radiological hazard of nuclear power generation. Smith, *On Risk Assessment of High Level Radioactive Waste Disposal*, 39 NUCLEAR ENGINEERING & DESIGN 293 (1976).

[12] Wright, *Disposal of Radioactive Wastes*, 10 ATOMIC ENERGY L.J. 239, 242 (1968).

[13] *Id.* at 246.

[14] *Id.* at 241. Structural elements of the reactors, minerals in reactor coolant water, protective clothing, air, etc. may all be rendered radioactive if they are in proximity to nuclear fuel when it is being subjected to neutron bombardment.

> has not yet come to understand. At unpredictable times and places, this radioactive waste will reappear in man's food, air or water. It will not go away, for decades or centuries, or even millenia.[15]

Radioactive waste must be treated, contained, or disposed of in such a way that it will not endanger the surrounding population or the natural environment until its curie level diminishes to an acceptable radiation safety standard.[16] Of the various methods used,[17] disposal into the ground has proven to be an expedient and simple method.[18]

1. *High-level waste*

Disposal of high-level radioactive wastes is presently limited to the underground storage of liquid wastes in specially constructed tanks. These tanks are typically made of steel and are built on a 4-foot steel pan which is then completely enclosed in a concrete vault with foot-thick walls. The surrounding area is then filled with water. The burial grounds are in an area of impermeable clay several hundred feet thick. Both the vault and the water are monitored and spare tanks are available to pump waste from a leaking tank.[19] At present, there are millions of gallons of liquid waste stored in a similar fashion at various Atomic Energy Commission (AEC) installations.[20]

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[15] S. NOVIK, THE CARELESS ATOM 103 (1969).

[16] Formal radiation standards have been in existence for more than 40 years. The scientific basis for these standards is a composite of thousands of studies by hundreds of investigators worldwide which are reviewed continuously by national and international committees. The most important of these reviewing bodies include: The International Commission on Radiological Protection (ICRP), the National Council on Radiation Protection and Measurements (NCRP), and the United Nations Scientific Committee on Effects of Atomic Radiation (UNSCEAR). *See* Grendon, *Nuclear Power and the Environment,* 8 FORUM 70 (1972); Hansen, *Development and Application of Radiation Protection Standards,* 12 IDAHO L.J. 1 (1975).

[17] Low-level radioactive waste has been burned, released into bodies of water, or simply pushed into hugh piles and abandoned. However, pressure exerted by environmentalists and concerned citizens has led to the almost universal practice of burying low-level as well as high-level waste.

[18] *Atomic Age Trash,* Wall St. J., Jan. 25, 1971, at 1, col. 1.

[19] Pittman, *supra* note 4, at 9-10.

[20] At the end of 1969, more than 80 million gallons of such wastes were stored in about 200 underground tanks, ranging in capacity from 300,000 to 1.33 million gallons, at AEC facilities in Washington, Idaho, and South Carolina. UNITED STATES ATOMIC ENERGY COMMISSION, THE NUCLEAR INDUSTRY 262 (1969).

Although technological advances are being made toward the development of longer-lasting tanks to hold radioactive waste, a serious problem exists concerning the integrity of the older tanks still in use. In a 1970 survey of 183 AEC tanks, it was found that nine had leaked or were leaking.[21] In June of 1973, the loss of some 115,000 gallons of liquid waste from one tank was discovered at the AEC's Hanford Facility, in Richmond, Washington.[22] Because of inadequate data it is difficult to determine the period of time for which the tanks will maintain their integrity and effectively contain the liquid wastes. It may be necessary to transfer the wastes to new tanks, with attendant risks, at least several times before the radioactivity dissipates sufficiently to permit some form of more effective permanent disposal.[23]

All other proposals for long-term storage or disposal of high-level waste lie at the research and development stage.[24] Some of the proposals which have been considered include disposal in solar orbit and disposal in bedded salt.[25] This imprecise state of affairs concerning long-term storage and/or disposal of nuclear wastes has caused alarm to environmentalists, particularly in light of the great expansion of the nuclear power industry.[26]

Reference is made throughout this paper to the U.S. Atomic Energy Commission (AEC). It should be noted that this agency was abolished by the Energy Reorganization Act of 1974, 42 U.S.C. § 5801 (Supp. V. 1975), which went into effect on January 19, 1975. The Regulatory Staff of the AEC, under five Commissioners appointed by the President, became the Nuclear Regulatory Commission; the bulk of the AEC was incorporated into the Energy Research and Development Administration under a single administrator, also appointed by the President.

[21] *Atomic Age Trash, supra* note 18.

[22] THE NUCLEAR FUEL CYCLE, *supra* note 6, at 267. The particular tank that leaked was constructed in 1944 and thus was part of the older group of tanks located at Hanford. This leak was estimated to have taken 7 weeks to occur, thus raising the possibility that other tanks at Hanford and elsewhere may be leaking undetected.

[23] Snow, *Radioactive Wastes From Reactors*, 9 SCIENTIST AND CITIZEN 89 (1967). On June 2, 1969, the AEC announced a proposed new policy requiring that all high-level radioactive wastes be converted to solid form and shipped as soon as practicable to a federal waste repository. AEC Press Release M-132 (June 2, 1969).

[24] THE NUCLEAR FUEL CYCLE, *supra* note 6, at 219.

[25] *Id.*

[26] Dr. Alvin Weinberg, former Director of the AEC's Oak Ridge National Laboratory, has written: "The price we demand of society, for this magical energy source is both a vigilance and a longevity of our social institutions that we are quite unaccustomed to . . . . Is mankind prepared to extend the eternal vigilance needed?" Weinberg, *Social Institutes and Nuclear Energy*, SCIENCE (July 7, 1972).

2. *Low-level waste*

Low-level wastes have been disposed of in various ways since the beginning of nuclear energy production. With respect to aqueous wastes, the basic philosophy was to "dilute and disperse" by direct release into surface waters or by seepage into the ground.[27] Originally, low-level solid waste disposal was accomplished by mixing it with concrete in steel drums and dumping it into the sea.[28] However, because the Mexican government strongly opposed the dumping of radioactive wastes in the Gulf of Mexico, the AEC ultimately denied licenses for such activities in the Gulf on the basis of foreign policy considerations.[29]

Although dumping still continued in the Atlantic, this practice died when the AEC instituted a new policy of allowing low-level radioactive wastes to be buried at AEC facilities.[30] This program was expanded to permit burial of low-level wastes on state-owned land so as to assure perpetual care of the burial waste.[31]

Even though low-level wastes do not create the major problems of high-level waste, the sheer volume of this type of waste produces potential problem areas. Fears exist that if burial sites are not carefully chosen and operated,[32] buried contaminants with long decay rates, even though remaining under-

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[27] *Hearings on Industrial Radioactive Waste Disposal,* 86th Cong., 1st Sess., vol. 2 at 989 (1959).

[28] About 100,000 steel drums were buried at sea at depths in excess of 6,000 feet before 1965. Since the drums must be weighted with concrete, there is only a small usable capacity available. Used for solid waste disposal, this method is three to four times as costly as land burial. C. FOX, RADIOACTIVE WASTES 23-24 (1964).

[29] *In re* Industrial Waste Disposal Corp., 2 A.E.C. 70 (1962), 2 ATOM. EN. L. REP. (CCH) ¶ 11.462.

[30] UNITED STATES ATOMIC ENERGY COMMISSION, MAJOR ACTIVITIES IN THE ENERGY PROGRAMS, JAN.-DEC. 1960, at 101 (1961).

[31] In 1963, the AEC withdrew from providing land waste burial services, based on the availability of commercial waste disposal services which used state-owned burial grounds in Nevada and Kentucky. Since then, additional state-owned burial grounds have been established in Washington, Illinois, and New York. UNITED STATES ATOMIC ENERGY COMMISSION, *supra* note 20, at 251-52.

[32] The land-burial site at Maxey Flats has been critized because of the relatively short period (10 days) used to gather data concerning the geological and hydrological conditions of the area. Critics also claim the site has been operated with insufficient monitoring equipment, insufficient record-keeping of materials buried, and inadequate site security. J. Thomas, *supra* note 2, at 21.

ground for many years, may have a large enough quantity of nuclides to migrate far below ground and pollute a potable source of water.[33]

B. *Future Concerns*

In the wake of the coldest winter ever officially recorded in many states, the phrase "energy crisis" has become increasingly significant to most Americans. When one turns his thermostat up for more heat and nothing happens, his concern for how utility companies produce the energy to heat his home diminishes and his primary concern is simply that the energy be produced. It is in this context that many environmentalists fear America will turn wholeheartedly to nuclear energy to satisfy her growing appetite for energy[34] without completely considering the long-term impact of increased nuclear waste by-products upon our environment. The 1973 Pugwash Conference on Science and World Affairs concluded:

> Owing to potentially grave and as yet unresolved problems related to waste management, diversion of fissionable material, and major radioactivity release arising from accidents, natural disasters, sabotage, or acts of war, the wisdom of a commitment to nuclear fission as a principal energy source for mankind must be seriously questioned at the present time.[35]

These fears of the environmentalists have been countered by the AEC which has consistently minimized any danger associated with its activities.[36] Allied with the AEC are the utilities,

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[33] *Id.*

[34] The electric power needs of the United States have been doubling approximately every 10 years for over seven decades. To meet this need, nuclear power has become an integral part of the electrical generating economy in the United States. Today, there are 53 licensed nuclear plants that together represent more than 7% of our nation's total installed electrical generating capacity. In addition, there are 75 nuclear plants under construction and 106 more are planned. Rowden, *Nuclear Power Regulation in the United States: A Current Domestic and International Perspective,* 17 ATOMIC ENERGY L.J. 102, 103 (1975).

[35] Twenty-third Pugwash Conference on Science and World Affairs, Report of Working Group on Radioactive Pollution of the Environment (August 1973).

[36] According to a study released by the AEC on Aug. 20, 1974, the risks from nuclear power plant accidents are smaller than from other man-made or natural disasters. AEC Chairman Dixy Lee Ray said that there was "no such thing as zero risk,"

which have spent enormous sums of money advertising nuclear energy as a safe and acceptable means of obtaining our nation's energy needs without harm to the environment.[37]

Although the propaganda from both sides has been voluminous and many side issues have been raised, two basic propositions prevail. First, atomic energy technology produces substantial benefits to our energy-starved society. Second, the use of this technology generates wastes which, if discharged or disposed of in the biosphere involve some degree of risk.[38] Although the quantum of risk is uncertain, there can be no reasonable argument but that the current and future enjoyment of the benefits of nuclear energy technology is dependent upon careful and meticulous consideration in the planning and implementation of techniques for the management of radioactive wastes within safe radiation limits. A critical element necessary for the implementation of safe and proper techniques is the existence of a comprehensive and perpetual regulatory scheme.

III. THE REGULATION OF NUCLEAR ENERGY

Federal legislation has dealt with the regulation of the entire nuclear energy cycle—from the mining of uranium to nuclear waste disposal. Thus, although a particular piece of legislation authorizing an agency or state to establish standards or supervise nuclear operations may not specifically mention waste disposal, authority to regulate the nuclear operation field in general would give implied authority to regulate waste-disposal operations and standards.[39]

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but in terms of the study, the nuclear industry "comes off very well." ENERGY CRISIS 193 (L. Sobel ed. 1975).

[37] Senator Lee Metcalf disclosed that in 1969, utilities spent $328.8 million on sales and advertising, but a mere $41 million on research and development. Lapp, *The Nuclear Power Controversy,* THE NEW REPUBLIC 18 (Jan. 23, 1971).

An example of this type of advertising is a two-page spread in the June 22, 1970 issue of TIME magazine, proclaiming "The Western White House is Located about 4400 yards from this [San Onofie] California Nuclear Plant." Another advertisement appeared later in 1970 (Aug. 17) which stated: "Go Play in the Nuclear Park—The Grounds Adjacent to Nuclear Power Plants Are Safe and Clean Enough for a Children's Playground." Elliot, *Environmental Aspects of Nuclear Power,* 4 URBAN LAW. 33, 36 (1972).

[38] Green, *Radioactive Waste and the Environment,* 11 NATURAL RESOURCES J. 281, 290 (1971).

[39] Recent Cases, 25 VAND. L. REV. 418, 424 (1972).

A. *Initial Federal Monopolization*

Following World War II, the potential for peaceful use of nuclear energy was unclear. However, there was little doubt that this awesome energy source would affect our lives in significant ways. Anticipating this vast potential, Congress passed the Atomic Energy Act of 1946.[40] The Act reflected a basic policy decision that the federal government should continue its authority over the "development, utilization and control of atomic energy."[41] The Act noted the potential benefits to mankind as well as the hazards in both military and peaceful uses of atomic energy: the processing and utilization of source, byproduct, and special nuclear material must be regulated in the national interest and in order to provide for the common defense and security and to protect the health and safety of the public.[42] To administer these objectives the Act established the AEC and entrusted it with a triple role: (1) Managing the military use of atomic energy by the services; (2) developing and expanding peaceful use of atomic energy by private individuals and firms; and (3) assuring public health and safety from the dangers of atomic radiation.[43]

The AEC thus had exclusive ownership and control of fissionable materials and the facilities using them. This federal monopoly stemmed from the historical factor of wartime development, the federal government's monopoly of skilled personnel, the supposedly prohibitive costs of private or state development, and a nascent concern for the hazards involved. Peacetime uses of the technology were closely bound to defense applications and thus also considered to be a matter for exclusive federal concern.

B. *The Shift from Complete Federal Control*

Complete federal control in the nuclear energy field was significantly shifted by the Atomic Energy Act of 1954.[44] This

[40] 42 U.S.C. § 2011 (1970).

[41] *Id.*

[42] 42 U.S.C. § 2012(d)(1970).

[43] Ramey, *The Environmental Effects of Producing Electric Power, Hearings before the Joint Comm. on Atomic Energy*, 91st Cong., 1st Sess. 136 (Oct.-Nov. 1969).

[44] 42 U.S.C. § 2011 (1970).

Act loosened the Government's monopoly on the development of atomic energy for civilian purposes by delaying the 1946 Act's prohibitions against private ownership of utilization and production facilities. The 1954 Act was, however, careful to restate the authority of the AEC to promulgate the safety requirements which govern the possession and use of nuclear materials and the utilization of production facilities.[45] As was true of the 1946 Act, the 1954 Act did not carve out any significant role for the states.

C. *Increasing State Activity*

Although Congress had never expressly precluded state regulation, there had been little state activity in the area for two reasons. First, federal installations, the primary hazard sources, were exempt from state control. Second, it was assumed that the federal standards for private users and handlers preempted state action.[46] However, it was never the intention of Congress in its original granting of exclusive regulatory powers to the AEC that these powers would be retained for an extended period of time.[47] The Senate report accompanying the bill stated it was merely "interim legislation."[48] As a result, extensive Congressional studies and hearings were conducted as to the matter of federal/state cooperation and the desirability of increased participation by the states.

The Congressional hearings culminated in 1959 with the addition of Section 274 to the Atomic Energy Act.[49] Entitled "Cooperation With the States," this amendment enabled the AEC to relinquish many of its regulatory powers to the states. As a precondition, the AEC had to be satisfied that the submitted state program would be compatible with that of the AEC and adequate to protect public health and safety.

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[45] The standards are those deemed necessary or desirable to promote the common defense and security, to protect health, and to minimize danger to life or property. 42 U.S.C. § 2201(b)(1970).

[46] W. BERMAN & L. HYDEMAN, THE ATOMIC ENERGY COMMISSION AND REGULATING NUCLEAR FACILITIES 69 (1961).

[47] *See* 42 U.S.C. § 2021(a)(6)(1970).

[48] S. REP. No. 870, 86th Cong., 1st Sess. 9 (1959).

[49] Act of September 23, 1959, Pub. L. No. 86-373, § 1, 73 Stat. 688 (codified at 42 U.S.C. § 2021 (1970)).

For a state to be entitled to perform former AEC functions, the governor of the state had to enter into a "turnover agreement"[50] with the AEC. The Commission's regulatory authority would then discontinue "with respect to any one or more of the following materials within the State: (1) By-product materials; (2) source materials; and (3) special nuclear materials in quantities not sufficient to form a critical mass."[51] The Commission still retained authority and responsibility with respect to regulation of the construction and operation of any production or utilization facility,[52] the export from or import into the United States of by-product, source or special nuclear material, and the disposal into the ocean or sea of any nuclear waste.[53] The AEC was also, at its option, able to regulate the disposal of the by-product, source or special nuclear material whenever the Commission deemed such regulation desirable.[54]

D. *Growing Dissatisfaction with the Regulatory Scheme*

Despite the lofty goals of Section 274, it "did not conclusively allocate responsibility, and it also planted the seed for future conflict between the federal government and the states."[55] The provisions of the amendment, while establishing a procedure to allow more state participation, gave the AEC blanket authority to determine whether this participation was "compatible" with the AEC's standards. In effect, the states were still obligated to look to the AEC for the regulation standards affecting nuclear operations.

The states were concerned over the lack of clarification of their role in nuclear energy regulation. There also was concern by many people that the AEC's dominant regulatory role would jeopardize the safety of persons living near nuclear facilities or nuclear waste disposal sites. This fear rested on the premise

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[50] 42 U.S.C. § 2021(b)(1970). A "turnover agreement" simply guarantees that standards established by the AEC in regard to regulation of the listed materials will be met by the participating state.

[51] *Id.*

[52] 42 U.S.C. § 2014(v)(1970).

[53] 42 U.S.C. § 2021(c)(1970).

[54] 42 U.S.C. § 2021(c)(4)(1970).

[55] Comment, *Federal Preemption of State Laws Controlling Nuclear Power*, 64 GEO. L.J. 1323, 1325 (1976).

that officials in distant Washington would have neither the incentive nor the accountability to establish adequate safeguards.[56] To bolster this argument, critics pointed to the seemingly conflicting, dual role of the AEC—it has the responsibility for developing the use of atomic energy while at the same time the responsibility for regulating the industry.[57]

The states' frustration over their uncertain position in nuclear regulation was brought to a head in 1971 in *Northern States Power Company v. State.*[58] Minnesota had established a Pollution Control Agency (PCA) which promulgated its own radioactive waste emission standards. Northern States Power Company, a public utility, received a construction permit from the AEC and built a nuclear generating plant on the Mississippi River at Monticello, Minnesota. Allowing for what they considered to be a wide margin of safety, the engineers designed the plant to discharge waste with a maximum emission of only about 10 percent of the AEC-allowed radiation content. However, this level approached or exceeded the PCA limits, and to meet the state standard Northern States would have to design new equipment to regulate its waste.[59]

Northern States challenged the state's authority to enforce these regulations on the ground that exclusive jurisdiction had been vested in the AEC.[60] The district court held that under the doctrine of implied preemption the federal government has the sole authority to regulate nuclear power plants, including the regulation of radioactive effluents discharged from such facilities. The court found the intent to preempt in the 1959 amendment itself[61] and in its legislative history. The court predicted

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[56] *See* Boffey, *Gofman and Tamplin: Harassment Charges Against AEC, Livermore,* 169 SCIENCE 838 (1970); Gillette, *Reactor Emissions: AEC Guidelines Move Toward Critics' Position,* 172 SCIENCE 1215 (1971); Walsh, *Vermont: Forced to Figure in Big Picture,* 174 SCIENCE 44 (1971).

[57] "Remarkable is the Atomic Energy Commission, the Agency which has sole responsibility for the development and use of atomic energy. The AEC is also the agency with sole responsibility for regulation in this field. In fact, it is responsible for regulating its own activities . . . ." S. NOVICK, *supra* note 15, at 193.

[58] 447 F.2d 1143 (8th Cir. 1971), *aff'd* 405 U.S. 1035 (1972).

[59] 447 F.2d at 1145.

[60] *Id.*

[61] The court was supported by restrictions on the AEC's power to relinquish authority in 42 U.S.C. § 2021(c), (k)(1970), which state that: "Nothing in this section shall be construed to affect the authority of any State or local agency to regulate activities for purposes other than protection against radiation hazards."

that, "were the states allowed to impose stricter standards on the level of radio-active waste releases discharged from nuclear power plants, they might conceivably be so overprotective in the area of health and safety as to unnecessarily stultify the industrial development and the use of atomic energy . . . ."[62] Furthermore, the court made note of the fact that Minnesota did not have a turnover agreement with the AEC,[63] although it did not clarify what effect such an agreement would have.

E. *After Northern States*

Some authorities have concluded that Section 274 of the Atomic Energy Act expressly preempts all state regulation of radiation hazards that conflicts with the growth of nuclear generation of electricity and that is not pursuant to a valid AEC turnover agreement.[64] They point to the opinion in *Northern States,* which held that the AEC alone was capable of objectively balancing the legitimate interests involved and setting health and safety standards in accordance with desired industrial progress.[65] The states, it was reasoned, would be "overprotective in the area of health and safety . . . ."[66] Opponents of the above position assert that Congress did not expressly show an intent for the federal government to occupy exclusively the field of nuclear regulation. They point to the dissent in *Northern States,* which argued that the majority's "national interest" rationale was not persuasive when contrasted with the interest of the states in protecting the health and safety of their citizens from radioactive pollution.[67] The dissent suggests that in this area, which may profoundly affect the environment, the states should be permitted to regulate radioactive pollution because of its impact on the local environment.

This line of reasoning was used in *In re Dresden Nuclear*

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[62] 447 F.2d at 1154.

[63] *Id.* at 1149.

[64] *See* Murphy & La Pierre, *Nuclear "Moratorium" Legislation in the States and the Supremacy Clause: A Case of Express Preemption,* 76 COLUM. L. REV. 392, 445-46 (1976). *See* note 50, *supra,* for a definition of "turnover agreement."

[65] 447 F.2d at 1153-54.

[66] *Id.* at 1154.

[67] *Id.* at 1154-58.

Power Station,[68] in which the Illinois Pollution Control Board disagreed with the majority in *Northern States* and found nothing in the law to prohibit the federal and state governments from jointly exercising authority in the field.[69] The Board stated that the issue was whether its limitations in any way conflicted with the purpose of the federal statute, and held they did not. The Board pointed out that "there is no particular reason why the emissions from nuclear plants in Vermont should be the same as those in New Mexico."[70]

CONCLUSION

It is apparent that the states are willing to assume a more meaningful role in the regulation of the nuclear energy field. Specifically, the states have an interest in establishing adequate safety standards concerning the disposal of high- and low-level radioactive waste.[71] It is also apparent that there is a great deal of conflict concerning the states' proper role in this area.

It may be argued persuasively that the allowance of concurrent "reasonable" state regulation of pollution (radioactive waste) is not a bold or untried concept. In other areas where federal enactments have imposed controls on environmental pollution, Congress has provided for such a "reasonableness test" within the statutory framework of its regulatory scheme. For example, in the Air Quality Act of 1967,[72] HEW was authorized to develop air quality criteria[73] for the various "air quality control regions"[74] of the country. The states were then required to establish air quality standards and enforcement measures consistent with the federal criteria. The Act specifically provided that the states were not precluded "from adopting standards and plans to implement an air quality program which

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[68] 2 E.R.C. 1302 (Ill. Pollution Control Bd. 1971).

[69] *Id.* at 1304.

[70] *Id.* at 1306.

[71] Minnesota's maverick action in *Northern States* has evolved into a minor rebellion by the states which could lead to Balkanization of authority over radiation standards; at least 24 states have indicated support for Minnesota's position. Gillette, *supra* note 56.

[72] 42 U.S.C. §§ 1857-8571 (Supp. V, 1970).

[73] Air Quality Act of 1967, Pub. L. No. 90-148, § 107(b), 81 Stat. 490 (1967).

[74] *Id.* § 107(a)(2).

will achieve a higher level of ambient air quality than approved by the Secretary."[75]

The fear expressed by the court in *Northern States,* that state regulation will impede the development of atomic energy, may be unfounded. The federal courts are in a position to strike down any regulation which is unreasonable on grounds analogous to those applied to the taxation of interstate commerce by the states.[76]

The potential consequences of a reactor accident or of the unintentional release into the environment of a large amount of radioactive material from archival storage provide the incentive to clarify the responsibilities of the federal government and the states in regulation of nuclear energy production, material, and waste. Furthermore, the potential benefits of increased state responsibility in this area outweigh any potential hindrance to nuclear energy development or production. Local citizens may prefer state regulation because of a feeling that local officials will be better able to protect their health and safety interests than will distant Washington bureaucrats. If anything, increased and better coordinated state regulation will enhance the public acceptance of nuclear energy production, which is necessary to its long-term development. Even more important is the likelihood that increased state participation will insure an adequate institutional network to monitor and attend to the radioactive storage facilities in the years ahead.

Larry E. Rogers

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[75] *Id.* § 109, 81 Stat. 497.

[76] *See* National Bella Hess v. Department of Revenue, 386 U.S. 753, 756-58 (1967).