

The Price-Anderson Act: A Constitutional Meltdown of Tort Liability?

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In the wake of recent events at Three Mile Island, public concern about the safety of nuclear power has risen dramatically. Nonetheless, many members of government and industry are looking to the nuclear generation of electricity as the most promising prospect for meeting the nation's energy needs.¹ Currently, seventy nuclear reactors are in operation, eighty-five are under construction, and another eleven are in the planning stage.² As the number of reactors increases so does their kilowatt capacity.³ As a result, a nationwide debate has developed regarding the environmental risks created by the nuclear generation of power.⁴

Opponents of nuclear power suggest several scenarios in which radioactive materials known as fission products could threaten public safety. It is possible that released radioactive wastes could contaminate hundreds of acres of land for thousands of years. Or an earthquake could rupture a reactor core, releasing deadly fission products. Mechanical failure, human error or even sabotage could cause a reactor to drastically overheat. In the worst possible case the intense heat could melt the protective structure enclosing the nuclear material, causing the reactor core to contaminate the surrounding area. This is known as a "meltdown." Failure of an emergency cooling system could also result in such a meltdown.

Studies have estimated that, should a meltdown occur, thousands of lives could be lost and property damage could

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1. See, e.g., Bethe, *The Necessity of Fission Power*, 234 SCIENTIFIC AM. 21 (Jan. 1976); Address by T. Nemzek, Director, Division of Reactor Research and Development, U.S. Energy Research and Development Administration, to the International Platform Ass'n (Aug. 6, 1975) ("Nuclear Power—Myth and Reality").

2. NRC, PROGRAM SUMMARY REPORT, NUREG-0380 (1980).

3. JOINT COMM. ON ATOMIC ENERGY, 93d Cong., 2d Sess., SELECTED MATERIALS ON INDEMNITY AND INSURANCE LEGISLATION 56 (Joint Comm. Print 1974).

4. See ENVIRONMENTAL EDUC. GROUP, A PUBLIC REPORT ON NUCLEAR POWER PLANTS (1974); R. NADER, THE MENACE OF ATOMIC ENERGY (1977); S. NOVICK, THE CARELESS ATOM (1969).

amount to billions of dollars.⁵ In spite of the enormity of these figures the Price-Anderson Act⁶ insulates operators of nuclear power plants and certain other persons associated with the research, production or utilization of nuclear power from liability by limiting recoverable damages for a nuclear accident to \$660 million.⁷ In a recent case, *Duke Power Co. v. Carolina Environmental Study Group, Inc.*,⁸ the United States Supreme Court upheld the constitutionality of the limited liability provisions of the Price-Anderson Act.

This note will examine the correctness of the Supreme Court's conclusion that the Act conforms with the Constitution. Specifically, the constitutional issues to be discussed are: (1) whether the Act violates the due process clause of the Fifth Amendment on the ground that the amount of recovery is not rationally related to the potential losses; (2) whether the Act violates the equal protection component of the Fifth Amendment on the ground that the Act unreasonably places a greater burden upon those people living near nuclear reactors than upon people living far away; and (3) whether the Price-Anderson Act can be differentiated from constitutionally valid statutory schemes limiting liability such as automobile guest statutes, worker's compensation acts and the Swine Flu Act. In conclusion, it will be suggested that since alternatives are available to the Act's limited liability provisions, a different analysis of the constitutionality of the Act's recovery ceiling would have been more appropriate.

I. Estimated Consequences of a Nuclear Incident

Although \$660 million may appear to be a substantial sum to the average individual, damage resulting from a single nuclear incident could easily exceed this amount. If a reactor core were to accumulate heat sufficient to melt its surrounding steel walls and rupture the concrete containment building in which it is housed,

5. AEC, THEORETICAL POSSIBILITIES AND CONSEQUENCES OF MAJOR ACCIDENTS IN LARGE NUCLEAR POWER PLANTS, WASH-740, at 14 (1957) [hereinafter cited as WASH-740]; NRC, REACTOR SAFETY STUDY, WASH-1400, app. VI, at 70 (1975) [hereinafter cited as WASH-1400].

6. Pub. L. No. 85-256, 71 Stat. 576 (1957) (current version at 42 U.S.C. §§ 2012, 2014, 2039, 2073, 2210, 2232, 2239 (1978 & Supp. 1980)).

7. This sum is comprised of the \$500 million indemnity provided for under the Act as well as the \$160 million protection that each licensed nuclear reactor with a rated capacity of 100,000 kilowatts or more is required to maintain in private insurance. See 42 U.S.C. § 2210(e)(1978 & Supp. 1980); 10 C.F.R. § 140.11(a)(4)(1980); note 62 *infra*.

8. 438 U.S. 59 (1978).

large amounts of radioactivity could escape into the atmosphere.⁹ Several government studies estimating the consequences of a release of radioactivity have concluded that the resulting damage to the public could exceed the Act's liability ceiling.¹⁰

In 1957, the Brookhaven Report¹¹ attempted to predict the consequences of a reactor core meltdown. It based its predictions upon a 500,000 kilowatt reactor (which is one fifth the size of most existing reactors) located 30 miles from a major city.¹² The report concluded that a meltdown could result in 3,400 deaths, 43,000 acute injuries, and \$7 billion in property damage.¹³ "Depending upon the weather conditions and temperature of the released fission products," the report stated, "the areas affected could range from about 18 square miles to about 150,000 square miles."¹⁴

Another study conducted at the same time as the Brookhaven Report attempted to estimate the worst possible damage a specific reactor could produce.¹⁵ According to this report, if the 300,000 kilowatt Enrico Fermi plant in Lagoona Beach, Michigan, was to experience a core meltdown, and a release of 50% of its fission products, with weather conditions carrying radioactivity to the most heavily populated areas of Detroit, 133,000 deaths, 181,000 immediate injuries and 245,000 long-term injuries could result.¹⁶

In 1965, the Brookhaven Report was updated by the Atomic Energy Commission (AEC)¹⁷ to take into account the increased size of later model reactors. The study concluded that a meltdown could cause 45,000 deaths, 100,000 injuries, \$17 billion to \$280 billion in property damage and long term contamination of an area the size of Pennsylvania.¹⁸

9. WASH-1400, *supra* note 5, at 6.

10. *See* note 5 *supra*.

11. WASH-740, *supra* note 5.

12. *Id.* at 25.

13. *Id.* at 14.

14. *Id.*

15. AEC, A REPORT ON THE POSSIBLE EFFECTS ON THE SURROUNDING POPULATION OF AN ASSUMED RELEASE OF FISSION PRODUCTS INTO THE ATMOSPHERE FROM A 300 MEGAWATT NUCLEAR REACTOR LOCATED AT LAGOONA BEACH, MICHIGAN, APDA-120 (1957).

16. *Id.* Immediate injuries are defined as radiation injuries occurring within one year of exposure. Long-term injuries refer to injuries occurring more than one year after exposure. *See* S. NOVICK, *THE CARELESS ATOM* 163-64 (1969).

17. AEC, Papers on Update of WASH-740, at 59-9, 136-3 (1964) (unpublished papers on file at the NRC Public Documents Room, Washington, D.C., released June 25, 1973), *cited in* Note, *Nuclear Power and the Price-Anderson Act: Promotion over Public Protection*, 30 STAN. L. REV. 393, 431 n.179 (1978).

18. Denenberg, *Nuclear Power: Uninsurable*, 38 PROGRESSIVE 27, 28 (1974). It should be noted that the 1964 update was kept secret for eight years. As a result of a lawsuit filed

In 1975, the Nuclear Regulatory Commission (NRC) issued its best known reactor safety study—the Rasmussen Report.¹⁹ This study described several situations that could lead to a reactor core meltdown. A failure in the normal reactor cooling system accompanied by a failure of the emergency core cooling system could lead to dangerous overheating.²⁰ Any number of other conditions, including failures in the shutdown and decay heat removal systems, could result in a meltdown.²¹ The report estimated that, in the most adverse weather conditions, an accident arising out of a core meltdown could result in 3,300 prompt fatalities, \$14 billion in property damage, and the contamination of 3,200 square miles of land.²²

The Rasmussen Report, which is the most recent probability and damage report, estimated the likelihood of a core meltdown to be one in twenty-thousand per reactor per year.²³ Based upon one hundred operating reactors, the number anticipated to be in operation in the United States by 1990,²⁴ this means that the annual likelihood of a meltdown is one in two hundred. The report also indicated a positive correlation between amount of damage and degree of improbability of a core meltdown. According to the study, “[t]he core melt accident having a likelihood of one in 20,000 per reactor per year would most likely cause property damage of less than \$1,000,000.”²⁵ An accident causing damage of \$1 billion dollars was estimated to have a probability of one in 1,000,000.²⁶ Finally, an accident causing \$14 billion, which was considered to be the maximum possible damage, was estimated to have a probability of about one in 1,000,000,000 per reactor per year.²⁷

under the Freedom of Information Act, the study was made public in 1973. *Id.* at 29.

19. WASH-1400, *supra* note 5.

20. *Id.* at 6.

21. *Id.*

22. *Id.* at 83-85 (statistics based on one in a billion chance per reactor year). The Reactor Safety Study has been criticized for underestimating the delayed cancer fatalities by a factor of 35-50, delayed thyroid injuries by a factor of 0-12, inherited disorders by a factor of 10-65 and property damage by a factor of 5-10. See American Physical Society Study Group on Light-Water Reactor Safety, *Report to the American Physical Society*, 47 REVS. MOD. PHYSICS S106 (1975) (Supp. No. 1). See also *Nuclear Agency Revokes Support for Safety Study*, N.Y. Times, Jan. 20, 1979, at 1, col. 2.

23. WASH-1400, *supra* note 5, at 8.

24. This is according to a statement made by James G. Hanchett, Public Affairs Officer, NRC Region V, on Jan. 2, 1981. See also NRC PROGRAM SUMMARY REPORT, NUREG-0380 (1980).

25. WASH-1400, *supra* note 5, at 11.

26. *Id.*

27. *Id.* At this point, it should be noted that the NRC has recently withdrawn most of its support from the Rasmussen Report. *Nuclear Agency Revokes Support for Safety*

Actual nuclear accidents have occurred, although none, luckily, have produced damage of the magnitude estimated in the NRC studies. Nonetheless, a review of recent reactor mishaps helps put into perspective the liability limitations of the Price-Anderson Act. In Chalk River, Ontario, on December 12, 1952, a sudden generation of heat caused uranium rods in a reactor core to fuse, filling both the air and the surrounding cooling water with radioactive fission products.²⁸ On November 29, 1955, in Idaho Falls, Idaho, a core meltdown occurred during an experiment at the Experimental Breeder Reactor.²⁹ In that case, a misunderstanding between a scientist and an operator resulted in the melting of the fuel elements.³⁰ Fortunately, no personal injuries were reported.³¹ On October 10, 1957, the Number-One Pile Reactor in Windscale, England, malfunctioned, causing radioactive contamination of milk and vegetables³² and requiring the government to seize all growing food in a 400 square mile area around the plant.³³

In 1965, a fire at the AEC's Rocky Flats plant exposed 400 workers to high concentrations of plutonium; 25 workers were exposed to up to 17 times the permissible level.³⁴ As noted by the *Public Report on Nuclear Power Plants*,³⁵ "In one 18-month period, there were 24 fires, explosions, plutonium spills and contamination incidents. Some 325 workers have been contaminated by the radiation since 1953. Fifty-six workers got cancer; 14 have died."³⁶

On January 10, 1967, a water valve failure was responsible for radioactive contamination of the laundry of a fuel reprocessing plant located at West Valley, New York.³⁷ Of the two laundry

Study, N.Y. Times, Jan. 20, 1979, at 1, col. 2. Specifically, the NRC announced that it "does not regard as reliable the Reactor Safety Study's numerical estimate of the overall risk of a reactor accident." *Id.* Therefore, the Commission concluded, the absolute probability of a risk presented by the Rasmussen Report "'should not be used uncritically'" either in making regulatory decisions or for purposes of making policy decisions. *Id.* at 19.

28. ENVIRONMENTAL EDUC. GROUP, *supra* note 4, at 32.

29. AEC, OPERATIONAL ACCIDENTS AND RADIATION EXPOSURE EXPERIENCE 31 (1968).

30. *Id.*

31. *Id.*

32. ENVIRONMENTAL EDUC. GROUP, *supra* note 4, at 30. Due to the high radioactivity in the Irish Sea, embryo fish displayed deformed backbones. *Id.* See generally ROYAL COMMISSION ON ENVIRONMENTAL POLLUTION, NUCLEAR POWER AND THE ENVIRONMENT 59 (1976).

33. ENVIRONMENTAL EDUC. GROUP, *supra* note 4, at 30.

34. *Id.* at 31.

35. ENVIRONMENTAL EDUC. GROUP, *supra* note 4.

36. *Id.* at 31.

37. Severo, "Was soll man mit dem Zeug tun?" DER SPIEGEL, May 9, 1977, at 215.

workers who were exposed to radiation, one developed a bone disease and the other died of lung cancer in 1972.³⁸ On March 22, 1975, at the Browns Ferry Reactor in Alabama, a major cooling failure was caused by a fire started by a workman using a candle to inspect cables.³⁹ A core meltdown was prevented only because a pump, not designed for the purpose, was able to keep cold water flowing through the reactor core for several hours.⁴⁰

More recently, on March 28, 1979, the main feedwater system at the Three Mile Island nuclear generating plant malfunctioned.⁴¹ An auxiliary feedwater system which should have started automatically failed because a number of its manual valves had inadvertently been left closed.⁴² Without a feedwater supply, both the coolant temperature and the pressure inside the core rose, triggering a relief valve at the top of a pressurized tank.⁴³ It is estimated that approximately two hours after the initial malfunction, two-thirds of the twelve-foot high core stood uncovered.⁴⁴ This resulted in a continuous release of low level radiation through the ventilation system of the plant.⁴⁵ It is significant to note that, according to a report on the incident, if the relief valve had remained open another thirty to sixty minutes, "a substantial portion of the fuel in the core . . . would have melted."⁴⁶ Although neither Three Mile Island nor any other accident has yet occurred in this country which exceeded the \$660 million mark, the possibility does exist that such an accident could occur in the future.⁴⁷

In this connection, it should be noted that a very serious nuclear accident occurred in the Soviet Union in 1957. A Central Intelligence Agency report⁴⁸ about the accident stated the following:

In about 1956 there was an explosion at Chelyabinsk-40; the explosion lighted up the sky for a great distance and the newspapers in Chelyabinsk made a flimsy attempt to proclaim the event an unusual occurrence of the northern lights. The chief evidence

38. *Id.*

39. *Browns Ferry Nuclear Plant Fire: Hearings Before the Joint Comm. on Atomic Energy*, 94th Cong., 1st Sess. 134 (1975).

40. R. WEBB, *THE ACCIDENT HAZARDS OF NUCLEAR POWER PLANTS* 198-99 (1978). See also *Browns Ferry Nuclear Plant Fire*, *supra* note 39.

41. See SPECIAL INQUIRY GROUP, NRC, *THREE MILE ISLAND: A REPORT TO THE COMMISSIONERS AND THE PUBLIC* 14-15 (1980).

42. PRESIDENT'S COMM'N ON THE ACCIDENT AT THREE MILE ISLAND, REPORT 94 (1979).

43. *Id.* at 94-96.

44. *Id.* at 100.

45. See SPECIAL INQUIRY GROUP, *supra* note 41, at 25.

46. *Id.* at 20.

47. See generally 10 C.F.R. § 140.11(a)(4)(1980); note 62 *infra*.

48. Z. MEDVEDEV, *NUCLEAR DISASTER IN THE URALS* 195 (1979).

of the explosion was the tremendous number of casualties in the hospitals of Chelyabinsk. Many of the casualties were suffering from the effects of radiation.⁴⁹

According to Russian scientist Zhores Medvedev, the explosion occurred at an underground nuclear waste disposal site between Chelyabinsk and Tscheljabinsk and resulted in several thousand deaths and in the contamination of tens of thousands of inhabitants.⁵⁰

II. Legislative History

None of the nuclear accidents to date have resulted in liability for injuries or property losses in excess of \$660 million.⁵¹ However,

49. CIA, FOREIGN INTELLIGENCE INFORMATION REPORT No. OOK-323/20537-76 (Sept. 20, 1976), *reprinted in* Z. MEDVEDEV, *supra* note 48, at 195.

50. Z. MEDVEDEV, *supra* note 48, at 166. *See also* *Zehntausende Wurden Verseucht*, DER SPIEGEL, Apr. 9, 1979, at 42-46.

According to one CIA Report: "In spring 1958, he heard from several people that large areas north of Chelyabinsk were contaminated by radioactive waste from a nuclear plant operating at an unknown site near Kyshtym, a town 70 kilometers northwest of Chelyabinsk on the Chelyabinsk-Sverdlovsk railroad line. It was general knowledge that the Chelyabinsk area had an abnormally high number of cancer cases. To go swimming in the numerous lakes and rivers in the vicinity was considered a health hazard by some people. Food brought by the peasants to the Chelyabinsk market (rynek) was checked by the municipal health authorities in a small house at the market entrance where the peasants also paid their sales tax. How radioactive food was destroyed was unknown to source. Food delivered to the plants, schools, etc., by the kolkhozy and sovkhozy was probably examined by the latter themselves. Until 1958 passengers were checked at the Kyshtym railway station, and nobody could enter the town without a special permit. By what authority the permit was issued and why the checking was discontinued in 1958, source was unable to say. In addition, some villages in the Kyshtym area had been contaminated and burned down, and the inhabitants moved into new ones built by the government. They were allowed to take with them only the clothes in which they were dressed." CIA, FOREIGN INTELLIGENCE INFORMATION REPORT No. CSK-3/465, 141 (Feb. 16, 1961), *reprinted in* Z. MEDVEDEV, *supra* note 48, at 187.

According to another CIA Report: "In the winter of 1957, an unspecified accident occurred at the Kasli . . . atomic plant . . . All stores in Komensk-Uralskiy which sold milk, meat, and other foodstuffs were closed as a precaution against radiation exposure, and new supplies were brought in two days later by train and truck." CIA, FOREIGN INTELLIGENCE INFORMATION REPORT No. CS-3/389, 785 (March 4, 1959), *reprinted in* Z. MEDVEDEV, *supra* note 48, at 185.

"The only detail SOURCE could learn of the plant itself was that a 'tube' protruded from the surface of a nearby lake. Area was tightly guarded by military personnel. Plant employees lived in a settlement within the restricted area, which they were not allowed to leave and which no unauthorized person could enter. In 1959, a female worker who died was buried within the area; relatives were denied entry." CIA, FOREIGN INTELLIGENCE INFORMATION REPORT No. CSK-3/465, 141 (Feb. 16, 1961), *reprinted in* Z. MEDVEDEV, *supra* note 48, at 189.

51. It is also significant to note that according to the General Public Utilities Corpora-

it is clear that accidents do occur and that the scientific studies estimating possible loss from a serious accident conclude that actual damage could well exceed the liability ceiling of the Price-Anderson Act.

In light of clear evidence that damage from a nuclear disaster could exceed \$1 billion, the background and purpose of the Price-Anderson recovery limitations must be examined. Congress initially gave the federal government a monopoly in the field of nuclear technology with the enactment of the Atomic Energy Act of 1946.⁵² However, in order to encourage private industry to participate in the development of nuclear energy, Congress subsequently enacted the Atomic Energy Act of 1954.⁵³

Subsequent to passage of the 1954 Act, congressional hearings were held by the Joint Committee on Atomic Energy to discuss, among other things, the exceedingly high amount of damages faced by private industry in the event of a nuclear accident.⁵⁴ Potentially catastrophic liability was considered to be a deterrent to private industrial participation in the development of nuclear energy.⁵⁵ Industry's concern over the possibility of unlimited liability was exemplified by the testimony of Charles H. Weaver, vice president of Westinghouse Electric Corporation, in which he asserted

that Westinghouse could find itself "absolutely liable to the public should damage occur. Obviously, we cannot risk the financial stability of our company for a relatively small project no matter how important it is to the country's reactor development effort, if it could result in major liability in relation to our assets."⁵⁶

Referring to negotiations for the purchase of component parts for the nuclear reactor, Mr. Weaver testified:

Our supplier was unwilling to go ahead with the contract unless we agreed to indemnify him against nuclear risks . . . [I]n order to get the supplier to go ahead with the work, we had to promise him to resolve the indemnity problem before delivery of the

tion, operator of the Three Mile Island reactor, the cost of decontaminating the badly damaged reactor will amount to approximately \$1 billion. *Wall St. J.*, Nov. 10, 1980, at 3, col. 4.

52. Pub. L. No. 79-585, 60 Stat. 735 (superseded 1954). See 2 U.S. CODE CONG. & AD. NEWS 1803 (1957).

53. Pub. L. No. 83-703, 68 Stat. 919 (current version at 42 U.S.C. §§ 2011-2282 (1970 & Supp. 1975)).

54. See *Governmental Indemnity for Private Licensees and AEC Contractors Against Reactor Hazards: Hearings Before the Joint Comm. on Atomic Energy*, 84th Cong., 2d Sess. (1956) [hereinafter cited as *1956 Indemnity Hearings*]. See also *Three Mile Island Utility Lobbying Hard for Bailout*, *L.A. Daily J.*, Sept. 19, 1980, at 5, col. 4-5.

55. 2 U.S. CODE CONG. & AD. NEWS 1803 (1957).

56. *1956 Indemnity Hearings*, *supra* note 54, at 110.

equipment, or, in the alternative, reimburse him for his costs. This is an example of the immediacy of the problem.⁵⁷

Although the Joint Committee regarded the risk of a serious accident as extremely remote,⁵⁸ there was considerable reluctance on the part of its members and on the part of industry spokesmen to estimate the potential damage. However, an "off the record" estimate of \$5 billion was mentioned by the committee's chairman Clinton Anderson.⁵⁹

It was against this background that the Joint Committee recommended that the deterrent of enormous liability be removed by making available a public fund from which liability claims could be satisfied.⁶⁰ In response, Senator Anderson introduced Senate Bill 715 on January 3, 1957. This bill provided that "[t]he amount of financial protection required [of a licensee] shall not exceed the amount of liability insurance available from private sources."⁶¹ In addition, the bill provided that "[t]he aggregate liability for a simple nuclear incident of persons indemnified shall not exceed the sum of \$500,000,000 together with the amount of financial protection required and any other sums which may be made available by the Congress as additional indemnification."⁶² Representative Melvin Price introduced the identical bill in the House on January 5, 1957.⁶³ These bills, known as the Price-Anderson Act, became law

57. *Id.* at 116.

58. *Id.* at 158.

59. *Id.*

60. *See generally id.*

61. S. 715, 85th Cong., 1st Sess. § 170 (1957).

62. *Id.* It should be noted that 10 C.F.R. § 140.11(a)(4) provides that each licensed nuclear reactor which has a rated capacity of 100,000 kilowatts or more is required to maintain financial protection in an amount equal to \$160 million.

"(a) Each licensee is required to have and maintain financial protection:

"(1) In the amount of \$1,000,000 for each nuclear reactor he is authorized to operate at a thermal power level not exceeding ten kilowatts;

"(2) In the amount of \$1,500,000 for each nuclear reactor he is authorized to operate at a thermal power level in excess of ten kilowatts but not in excess of one megawatt;

"(3) In the amount of \$2,500,000 for each nuclear reactor other than a testing reactor or a reactor licensed under section 104b of the Act which he is authorized to operate at a thermal power level exceeding one megawatt but not in excess of ten megawatts; and

"(4) In an amount equal to the sum of \$160,000,000 and the amount available as secondary financial protection (in the form of private liability insurance available under an industry retrospective rating plan providing for deferred premium charges) for each nuclear reactor which is licensed to operate and which is designed for the production of electrical energy and has a rated capacity of 100,000 electrical kilowatts or more: *Provided, however,* That under such a plan for deferred premium charged for each nuclear reactor which is licensed to operate, no more than \$5 million with respect to any nuclear incident and no more than \$10 million within one calendar year shall be charged."

63. H.R. 1981, 95th Cong., 1st Sess. § 170 (1957).

on September 2, 1957, without floor debate in either house.⁶⁴

III. Limited Liability Provisions

As a condition for obtaining a license⁶⁵ and construction permit,⁶⁶ the Price-Anderson Act requires that the licensee (the utility) provide and maintain private financial protection⁶⁷ in an amount determined by the Nuclear Regulatory Commission⁶⁸ and enter into an indemnification agreement with the NRC. In pertinent part, the Act provides:

The aggregate liability for a single nuclear incident of persons indemnified, including the reasonable costs of investigating and settling claims and defending suits for damage, shall not exceed (1) the sum of \$500,000,000 together with the amount of financial protection required of the licensee or contractor or (2) if the amount of financial protection required of the licensee exceeds \$60,000,000, such aggregate liability shall not exceed the sum of \$560,000,000 or the amount of financial protection required of the licensee, whichever amount is greater: *Provided*, That in the event of a nuclear incident involving damages in excess of that amount of aggregate liability, the Congress will thoroughly review the particular incident and will take whatever action is deemed necessary and appropriate to protect the public from the consequences of a disaster of such magnitude.⁶⁹

This section can be divided into four basic components. First, the Act requires NRC licensees to furnish financial protection in the form of insurance in amounts determined by the Commission. Second, it requires the Commission to provide indemnification of up to \$500 million for each nuclear incident. Third, the Act limits liability for a nuclear incident to the aggregate of the Commission's indemnity and the amount of private insurance required. Finally, by a 1975 Amendment, the Act authorizes Congress, in the event of

64. See 2 U.S. CODE CONG. & AD. NEWS 1803 (1957).

65. 42 U.S.C. § 2131 (1978).

66. 42 U.S.C. § 2235 (1978).

67. "The term 'financial protection' means the ability to respond in damages for public liability and to meet the costs of investigating and defending claims and settling suits for such damages." 42 U.S.C. § 2014 (K)(1978).

68. 42 U.S.C. § 2210(a)(1978). It should be noted that the Energy Reorganization Act of 1974, 42 U.S.C. §§ 5801-5891 (1977 & Supp. 1980) abolished the AEC, 42 U.S.C. § 5814 (1977), and replaced it with the Energy Research and Development Administration, 42 U.S.C. §§ 5811-5820 (1977 & Supp. 1980) and the Nuclear Regulatory Commission (NRC), 42 U.S.C. §§ 5814-5849 (1977 & Supp. 1980). Under 42 U.S.C. § 5842, the NRC assumed the AEC's former licensing and regulatory functions.

69. 42 U.S.C. § 2210(e)(1978).

a nuclear incident resulting in damage in excess of the aggregate liability limit, to "review" the incident and to take "whatever action is deemed necessary and appropriate."⁷⁰

Beyond these fundamental provisions, the Price-Anderson Act establishes other limits on liability. One provision exempts nuclear power plants with a capacity of less than 100,000 kilowatts from the \$660 million financial protection provision.⁷¹ These plants are required to maintain "the maximum amount [of liability insurance] available at reasonable cost and on reasonable terms from private sources."⁷²

The Act also extends its limited liability provisions to certain government contractors and nonprofit and educational institutions engaged in the construction of nuclear facilities.⁷³ Under the 1975 Amendments,⁷⁴ the NRC may agree to indemnify its contractors for up to \$500 million and may further require its contractors to provide a private source of financial protection "in such amounts as the Commission may determine to be appropriate to cover public liability. . . ."⁷⁵ Nonprofit educational institutions, on the other hand, are exempted from the requirement that private financial protection be obtained.⁷⁶ The Act thus provides for an aggregate indemnity, in such cases, in an amount not to exceed \$500 million for damages resulting from any one nuclear incident.⁷⁷

70. *Id.*

71. 42 U.S.C. § 2210(b)(1978). It should be noted that only four plants have low enough kilowatt ratings to escape this provision. See *Electricity from Nuclear Power*, ATOMIC INDUSTRIAL FORUM 9-14 (1977).

72. 42 U.S.C. § 2210(b)(1978). According to the NRC, \$140,000,000 is presently the maximum amount of liability insurance "available at reasonable cost" from private sources.

73. 42 U.S.C. § 2210(d)(1978) (government contractors); 42 U.S.C. § 2210(k) (1978) (nonprofit and educational instructors).

74. 42 U.S.C. § 2210 (1978).

75. *Id.* As defined in 42 U.S.C. § 2014(w)(1978), "public liability" means any legal liability arising out of a nuclear incident except certain claims such as state or federal worker's compensation claims.

76. 42 U.S.C. § 2210(k)(1978).

77. *Id.* In contrast to the limitations on liability for damages resulting from a nuclear incident in the private sector, section 2211 of the *Public Health and Welfare Code* states that "[I]t is the policy of the United States that it will pay claims . . . [for damages] . . . proven to have resulted from a nuclear incident involving the nuclear reactor of a United States warship." 42 U.S.C. § 2211 (1978). Thus, while the private side of nuclear industry is protected from full liability for damages, the public side, at least insofar as warships are concerned, bears full liability for the inescapable risks. While the Act has undergone several amendments, the original limited liability provision has remained unchanged. 42 U.S.C. § 2210(c)(1978).

IV. Constitutionality of the Price-Anderson Act

The constitutionality of the Price-Anderson Act has been ruled upon in two federal cases: *Carolina Environmental Study Group, Inc. v. United States Atomic Energy Commission*⁷⁸ and *Duke Power Co. v. Carolina Environmental Study Group, Inc.*⁷⁹ In the former case a federal district court held certain sections⁸⁰ of the Price-Anderson Act to be unconstitutional as violating the due process and equal protection provisions of the Fifth Amendment. The district court held that the challenged sections of the Price-Anderson Act violated the due process clause by allowing "the destruction of the property or the lives of those affected by nuclear catastrophe without reasonable certainty that the victims will be justly compensated."⁸¹ The court gave three reasons for this conclusion. First, since damage to life and property resulting from a nuclear accident could easily exceed the limit on liability, "[t]he amount of recovery is not rationally related to the potential losses."⁸² Second, the "low ceiling . . . placed on accountability to the public [tends] to diminish rather than to heighten steps necessary to protect the public and the environment."⁸³ Finally, the court noted the lack of benefits accruing to those who lived near a nuclear plant when measured against the potential burdens.⁸⁴

The district court also held that the Act violated the equal protection provision included in the due process clause of the Fifth

78. 431 F. Supp. 203 (W.D.N.C. 1977).

79. 438 U.S. 59 (1978).

80. 42 U.S.C. §§ 2210(c), 2210(e)(1978).

81. 431 F. Supp. at 222.

82. *Id.*

83. *Id.* at 223.

84. *Id.* at 223-24. The court gave several reasons supporting the conclusion that there is no *quid pro quo*. First, the court reasoned that since the principle of *Rylands v. Fletcher*, L.R. 3 H.L. 330 (1868) (which held the owner of a dam liable for the property damage sustained by downstream land owners when the dam burst) applies to those who engage in ultrahazardous activities, operators of nuclear reactors do not confer a benefit to potential plaintiffs when the operators waive defenses of negligence, contributory negligence and assumption of risk. 431 F. Supp. at 223. A second reason is that, in contrast to an airline passenger who in theory has an option to travel or stay at home, the neighbor of a nuclear reactor has no such option to accept or reject the risks of contamination. *Id.* at 224. Third, the court stated, "[p]rompt release of funds without prolonged litigation is not afforded. The Act promotes uncertainty rather than certainty and delay rather than promptness in the settlement of claims." *Id.* (emphasis in original). Fourth, there is no *quid pro quo* because, unlike claims under workmen's compensation and the Warsaw Convention, claims under the Price-Anderson Act "[bear] more relationship to the number of people injured than to the severity of the injury." *Id.* Finally, the court noted that the limitation of the Price-Anderson Act is absolute and applies to companies even though a nuclear catastrophe may be the result of "willful [mis]conduct or gross negligence." *Id.*

Amendment⁸⁵ “because [the Act] provides for what Congress deemed to be a benefit to the whole society (the encouragement of the generation of nuclear power), but places the cost of that benefit on an arbitrarily chosen segment of society, those injured by nuclear catastrophe.”⁸⁶ The Price-Anderson Act, as viewed by the court, “irrationally places the risk of [a] major nuclear accident upon people who happen to live in the areas which may be touched by radioactive debris.”⁸⁷ Additionally, the court noted that the statute “unreasonably places a greater burden upon people damaged by nuclear accident than upon people damaged by other types of accidents, such as motor vehicle or electrical accidents, involving power companies.”⁸⁸ Moreover, the court reasoned that the Act violated equal protection since “[it] unreasonably and irrationally relieves the owners of power plants of financial responsibility for nuclear accidents and places that loss upon the people injured . . . who are . . . least able to stand such losses.”⁸⁹ The court concluded that alternatives to a liability ceiling rendered those provisions of the Act “unnecessary to serve any legitimate public purpose.”⁹⁰

In 1978, the United States Supreme Court reversed the district court and upheld the constitutionality of the Price-Anderson Act⁹¹ on both due process⁹² and equal protection grounds.⁹³

85. See *Bolling v. Sharpe*, 347 U.S. 497 (1954). The Court in *Bolling* stated that “[though] the Fifth Amendment . . . does not [expressly] contain an equal protection clause as does the Fourteenth Amendment . . . the concepts of equal protection and due process, both stemming from our American ideal of fairness, are not mutually exclusive.” *Id.* at 499.

86. 431 F. Supp. at 224-25.

87. *Id.* at 224.

88. *Id.*

89. The court suggested two alternatives. First, it suggested the establishment of a liability pool requiring contributions in advance. The court stated that “[t]his would effectively place the responsibility upon the group most directly profiting from any improvement in the costs or usefulness of electric power—the power company stockholders and the customers. . . .” 431 F. Supp. at 224. It appears that this would also mean abandoning the Act’s indemnification provisions. The second alternative the court suggested is to “make [nuclear] accidents a national loss and to pay those damaged out of the federal treasury.” *Id.* The advantage of this proposal is that it “would spread the loss among those who benefitted indirectly by having the nation’s power supply increased as well as among those who presumably benefitted directly.” *Id.*

90. *Id.*

91. *Duke Power Co. v. Carolina Environmental Study Group, Inc.*, 438 U.S. 59 (1978).

92. *Id.* at 82-93.

93. *Id.* at 93.

A. The Due Process Clause

First, addressing the due process challenge, the Court found that since the Act's legislative purpose was to "stimulate the private development . . . of nuclear power . . . the liability limitation . . . emerges as a classic example of an economic regulation . . . which come[s] to the Court with a presumption of constitutionality."⁹⁴ The burden of establishing this limitation as irrational or arbitrary, therefore, falls on the party complaining of a due process violation. The then-existing \$560 million liability limitation is neither irrational nor violative of due process, the Court continued, since "expert appraisals . . . [indicate that there is an] exceedingly small risk of a nuclear incident involving claims in excess of \$560 million."⁹⁵ The Court's opinion also indicated that Congress would enact "extraordinary relief provisions" in the event of a nuclear disaster resulting in claims in excess of \$560 million.⁹⁶ Furthermore, since the choice of a liability figure would inevitably be based upon imponderables, "[w]hatever ceiling figure is selected will, of necessity, be arbitrary."⁹⁷ Finally, the Court stated that since "nothing in the liability-limitation provision undermines or alters in any respect the rigor and integrity of [the licensing process], the District Court's . . . conclusion that the Price-Anderson Act 'tends to encourage irresponsibility . . . on the part of builders and owners' of the nuclear power plants, simply cannot withstand careful scrutiny."⁹⁸ The Court noted that in the event of a serious

94. *Id.* at 83. The Court cited *Usery v. Turner Elkhorn Mining Co.*, 428 U.S. 1 (1976). *Usery* arose under Title IV of the Federal Coal Mine Health and Safety Act of 1969 which required, among other things, that operators of coal mines compensate former employees who terminated their work before the Act was passed. 30 U.S.C. § 411(c)(3)-(4)(1979). In holding that the Act does not violate the due process clause of the Fifth Amendment, the Supreme Court stated: "It is now well established that legislative Acts adjusting the burdens and benefits of economic life come to the Court with a presumption of constitutionality, and that the burden is on one complaining of a due process violation to establish that the legislature has acted in an arbitrary and irrational way." 428 U.S. at 15.

95. 438 U.S. at 85-86. The Court based this conclusion on S. REP. NO. 94-454, 94th Cong., 1st Sess. 12 (1975), which states that "the probabilities of a nuclear incident are much lower and the likely consequences much less severe than has been thought previously." 438 U.S. at 86 n.30. In contrast, the EPA and the Union of Concerned Scientists have stated that the *Reactor Safety Study* (WASH-1400), notes 5 & 22 *supra*, underestimated the consequences of a nuclear incident.

96. 438 U.S. at 85. The Court relied on H.R. REP. NO. 89-883, 89th Cong., 1st Sess. 6-7 (1965) which stated that "in the event of a national disaster, . . . it is obvious that Congress would have to review the problem and take appropriate action." Moreover, "[t]he limitation of liability serves primarily as a device for facilitating further congressional review . . . rather than as an ultimate bar to further relief of the public." 438 U.S. at 86.

97. *Id.*

98. *Id.* at 87 (citation omitted).

accident the utility itself would risk bankruptcy, or at least great amounts of damage, and that such risk is in itself no small incentive to avoid the kind of irresponsible and cavalier conduct implicitly attributed to the utility by the district court. Moreover, the Court stressed that the Act provides a "fair and reasonable substitute for the uncertain recovery of damages of this magnitude from a utility or component manufacturer, whose resources might well be exhausted at an early stage."⁹⁹

The Court further rejected the district court's conclusion that the Act failed to maintain a *quid pro quo*.¹⁰⁰ The Court did not determine whether the due process clause requires that a legislatively enacted compensation system "either duplicate the recovery at common law or provide a reasonable substitute remedy"¹⁰¹ since the Price-Anderson Act was held to provide a "reasonably just substitute for the common-law or state tort law remedies it replaces."¹⁰²

B. The Equal Protection Provision

The Supreme Court also held that the Act's liability ceiling was consistent with the equal protection provision of the Fifth Amendment.¹⁰³ This conclusion was reached by balancing the competing interests of the importance of nuclear power against the burden borne by those injured in nuclear accidents.¹⁰⁴ This balancing process is apparent in the Court's statement that:

The general rationality of the Price-Anderson Act liability limitations—particularly with reference to the important congressional purpose of encouraging private participation in the exploitation of nuclear energy—is ample justification for the difference in treatment between those injured in nuclear accidents and those whose injuries are derived from other causes.¹⁰⁵

The Court did not engage in any more detailed equal protection analysis.

V. Constitutional Analysis

In the preceding discussion it was seen that the Supreme

99. *Id.* at 91.

100. *Id.* at 87-88.

101. *Id.* at 88.

102. *Id.*

103. *Id.* at 93-94.

104. *Id.*

105. *Id.*

Court upheld the Price-Anderson Act on due process grounds for five reasons: (1) the risk of damage exceeding \$560 million is "exceedingly small";¹⁰⁶ (2) if damage were to exceed \$560 million, "Congress would likely enact extraordinary relief provisions;¹⁰⁷ (3) any liability ceiling figure would of necessity be arbitrary;¹⁰⁸ (4) the "rigor" of the licensing process precludes the possibility that the Price-Anderson Act might encourage irresponsibility on the part of builders and owners of nuclear reactors;¹⁰⁹ and (5) like other constitutionally valid limitations of liability,¹¹⁰ the Price-Anderson Act provides a "reasonably just substitute for the common-law . . . remedies it replaces."¹¹¹

Each of these five reasons, however, may be effectively rebutted. First, the Court ignored evidence that the report it relied on for data on nuclear accidents, the Reactor Safety Study,¹¹² seriously underestimated the risk of a major nuclear accident.¹¹³ According to the Environmental Protection Agency,¹¹⁴ the Reactor Safety Study understated the risk based on underestimated health effects, evacuation doses, and probabilities of releases of radioactivity in a value between one and several hundred.¹¹⁵ Consistent with the EPA Report, a study by the Union of Concerned Scientists concluded that the Reactor Safety Study seriously underestimated the probability of a reactor meltdown.¹¹⁶ The NRC has, in fact, recently withdrawn most of its support of the Reactor Safety Study.¹¹⁷

A more accurate view of the risks involved may have been provided in the testimony of nuclear scientist Henry W. Kendall at

106. *Id.* at 85-86.

107. *Id.* at 85.

108. *Id.* at 86.

109. *Id.* at 87.

110. The Court cited *Silver v. Silver*, 280 U.S. 117 (1929)(automobile guest statute); *Providence & N.Y.S.S. Co. v. Hill Mfg. Co.*, 109 U.S. 578 (1883)(limitation of vessel owner's liability); *Indemnity Ins. Co. v. Pan Am. Airways*, 58 F. Supp. 338 (S.D.N.Y. 1944) (Warsaw Convention limitation of air carrier's liability for injuries suffered during international air travel). 438 U.S. at 88 n.32

111. *Id.*

112. See notes 5 & 22 *supra*.

113. It should be noted that the Court did mention the fact that the Reactor Safety Study has been criticized. In note 28 of *Duke Power Co.*, the Court stated: "For a thorough criticism of the Reactor Safety Study, see EPA, Reactor Safety Study (Wash-1400): A Review of the Final Report (June 1976)." 438 U.S. at 85 n.28.

114. EPA, REACTOR SAFETY STUDY (WASH-1400): A REVIEW OF THE FINAL REPORT, EPA-520/3-76-009 (1976).

115. *Id.*

116. See note 140 *infra*.

117. See note 27 *supra*.

the district court trial.¹¹⁸ "There is about one chance in five years of a meltdown among 100 reactors during the normal life of those reactors,"¹¹⁹ Kendall estimated. In particular, Dr. Kendall testified that since the Reactor Safety Study only covered the first five years of each reactor's life,¹²⁰ the study did not properly evaluate the effects of aging and wear and tear.¹²¹ Furthermore, Dr. Kendall testified that the study did not adequately consider the chance of damage precipitated by earthquakes or sabotage and that "only a few of the possible accident sequences had really been thoroughly evaluated."¹²²

In light of the apparent shortcomings of the Reactor Safety Study, the Supreme Court's conclusion that the risk of damage exceeding the then-existing \$560 million figure is "exceedingly small"¹²³ rests on a remarkably weak foundation. If the Supreme Court is correct in assuming that the probability of a major accident is only one in ten million,¹²⁴ then the Court should not have hesitated to encourage Congress to assume full responsibility for the possible consequences of a nuclear accident. As Herbert S. Denenberg, former Pennsylvania Commissioner of Insurance recently pointed out, "[t]he Price-Anderson Act is continuous proof that our present nuclear technology is not safe enough to permit those who control it to be financially responsible for its consequences."¹²⁵

Second, the Court's reliance upon the "likelihood" that Congress would enact extraordinary relief provisions¹²⁶ in the event of excessive damage is subject to the criticism that full compensation is thus made dependent upon merely political factors. By relying upon congressional action, the Supreme Court has preserved the uncertainty inherent in the compensation scheme of the Price-Anderson Act. That full compensation is not always paid to accident

118. Dr. Henry Kendall, Professor of Physics at M.I.T., testified for the plaintiffs at the district court. 431 F. Supp. at 212.

119. *Id.* at 213.

120. *Id.*

121. *Id.*

122. *Id.* Also notable is the fact that the Reactor Safety Study is not signed by any person and is prefaced by the statement that "[n]either the United States nor the U.S. Nuclear Regulatory Commission . . . makes any warranty, express or implied, nor assumes any legal liability or responsibility for the accuracy of [the report]." WASH-1400, *supra* note 5 (inside cover). This statement seems to indicate the author's desire to discourage reliance on the accuracy of the report.

123. See note 95 and accompanying text *supra*.

124. WASH-1400, *supra* note 5, at 83-84, Tables 5-4 & 5-7.

125. Denenberg, *supra* note 18, at 27.

126. 438 U.S. at 85.

victims is demonstrated by the experience of victims of the Texas City Disaster of 1947¹²⁷ and of the atomic tests in Utah and New Mexico in the late 1940's.¹²⁸ If the Court is correct in assuming that the risk of major damage is "exceedingly small,"¹²⁹ a logical step would have been to abandon the uncertain compensation scheme of the Price-Anderson Act.

Third, the Court's statement that any liability ceiling will "of necessity be arbitrary"¹³⁰ is a curious justification for the constitutionality of the Act. That the Act's liability ceiling is arbitrary is precisely the argument raised against the constitutionality of the Act. While other legislative schemes which limit liability also have liability ceilings,¹³¹ they do not make the amount of compensation received by an individual dependent upon the number of plaintiffs injured as does the Price-Anderson Act.¹³² Moreover, while other

127. "As a result of explosions of ammonium nitrate fertilizer, over 570 persons were killed and 3,500 injured, and great property losses occurred. . . . After the Supreme Court decision in *Dalehite v. United States*, 346 U.S. 15 (1953), which held that the government was not liable to the victims, Congress enacted the Texas City Disaster Relief Act, 69 Stat. 707 (1961) eight years after the catastrophe. The statute set a limit of \$25,000 on awards for death, personal injuries, or property damage, although many of the victims suffered property damages demonstrably in excess of that sum. . . . Under a 1959 amendment permitting slightly more liberal payments, it was estimated that up to about \$4 million additional would be paid. These figures contrast sharply with appraisals of the actual damages ranging from between \$60 million and \$100 million to about \$300 million to 'billions of dollars.'

" . . . The victims were left substantially or completely uncompensated for a period of from eight to ten years, and then in many cases received grossly inadequate compensation." A. ROSENTHAL, H. KORN & S. LUBMAN, *CATASTROPHIC ACCIDENTS IN GOVERNMENT PROGRAMS* 3-4 (1963).

128. *Study Shows High Leukemia Toll in Area of Utah Probably Hit by Nuclear Fallout*, *Wall St. J.*, Feb. 23, 1979, at 10, col. 1. It has been reported that residents of the sparsely populated area which received fallout from atomic bomb tests conducted from 1951 to 1963 in the Nevada desert are noticing an increase in leukemia, birth defects, sterility, miscarriages and cancer. Segel, *Utah Residents File Fallout Suit*, *HEALTH WATCH*, Fall 1980, at 8. See also Fadiman & Jacobson, *The Downwind People*, *LIFE*, June 1980, at 2. One study found that the incidence of leukemia in children born between 1951 and 1958 in high fallout counties in southern Utah was 2.44 times greater than in children born in the same counties before or since this seven year period. Lyon, Klauber, Gardner & Udall, *Childhood Leukemias Associated With Fallout From Nuclear Testing*, *NEW ENGLAND JOURNAL OF MEDICINE*, Feb. 22, 1979, at 397-402. Because the government has not provided compensation for those injured from fallout, 965 claimants from St. George, Utah have recently filed a \$500 million lawsuit against the United States Government charging that the Atomic Energy Commission and the United States Government were negligent in failing to provide residents with sufficient information about the health dangers of atomic testing. Segel, *Utah Residents File Fallout Suit*, *HEALTH WATCH*, Fall 1980, at 8.

129. See note 95 and accompanying text *supra*.

130. See note 97 and accompanying text *supra*.

131. See note 110 and accompanying text *supra*.

132. 42 U.S.C. § 2210(e)(1978).

legislative schemes which limit liability guarantee a given amount of compensation,¹³³ the Price-Anderson Act guarantees a given amount of compensation only in the event of congressional action.¹³⁴ It follows that in recognizing that any liability ceiling is arbitrary, the Court should have taken the next logical step and declared the Act unconstitutional as a violation of due process of law.

Fourth, the Court's statement that the "rigor and integrity" of the licensing process precludes the possibility that the Price-Anderson Act might encourage irresponsibility on the part of builders and owners of nuclear reactors¹³⁵ is contradicted by several studies.

In 1973, the AEC conducted a task force study of the reactor licensing process.¹³⁶ Not made public until 1974, the study stated that "there is still an unanswered question as to the quantified degree of safety . . . of a nuclear power plant."¹³⁷ The report continued:

Approximately 850 abnormal occurrences were reported to the AEC during the 17 month period used as a sample base (January 1, 1972 to May 31, 1973). These abnormal occurrences involved malfunctions or deficiencies associated with safety related equipment. Forty percent of the occurrences were traceable in some extent to possible design and/or fabrication related deficiencies. The primary cause of at least 200 of the component malfunctions was design and/or fabrication errors. The remaining incidents were precipitated by operator error, improper maintenance, inadequate erection control, administrative deficiencies, random failure, and variations of the foregoing.¹³⁸

The task force concluded that: "The large number of reactor incidents, coupled with the fact that many of them had real safety significance, . . . raises a serious question regarding the current review and inspection practices both on the part of the nuclear industry and the AEC."¹³⁹

Similarly, a 1972 study conducted by the Rand Corporation¹⁴⁰

133. See generally note 110 and accompanying text *supra*.

134. 42 U.S.C. § 2210(e)(1978).

135. 438 U.S. at 87. See note 98 and accompanying text *supra*.

136. AEC, EVALUATIONS OF INCIDENTS OF PRIMARY COOLANT RELEASE FROM OPERATING BOILING WATER REACTORS (1972), portions appearing in UNION OF CONCERNED SCIENTISTS, THE NUCLEAR FUEL CYCLE 112 (1975).

137. *Id.*

138. *Id.* at 112-13.

139. *Id.* at 113.

140. See UNION OF CONCERNED SCIENTISTS, THE NUCLEAR FUEL CYCLE 113 (1975) (reprinting portions of Rand Corp. Study).

reviewed reactor accidents and noted the "increasing reports of poor quality control and documented carelessness in manufacture, operation and maintenance of these complex machines."¹⁴¹ Consistent with the Rand Study, the Union of Concerned Scientists concluded in their book, *The Nuclear Fuel Cycle*, that "a reactor accident with major consequences is a real possibility in the coming decades."¹⁴² To be sure, the recent accident at Three Mile Island came perilously close to an accident with "major consequences." In light of this evidence it is difficult to see how the "rigor and integrity"¹⁴³ of the licensing process precludes irresponsibility on the part of builders and owners of nuclear reactors.

Fifth, the Court's statement that the Price-Anderson Act is similar to other constitutionally valid limitations of liability is open to criticism. Although the Court stated that the Act provides a "reasonably just substitute for the common-law . . . remedies it replaces,"¹⁴⁴ the Act's liability ceiling is fundamentally dissimilar to other constitutionally valid limitations of liability.

Automobile guest statutes are a common example of legislated liability ceilings. Typical legislation of this type prohibits most recovery by an individual traveling as a guest in another's motor vehicle.¹⁴⁵ The purpose of such a statute is to prevent the "serious public evil" presented by "many instances of collusion, utter indifference to results because of protective insurance, perjury and consequent fraud upon the courts."¹⁴⁶

In *Silver v. Silver*,¹⁴⁷ the United States Supreme Court held that a Connecticut guest statute did not violate the equal protection clause of the Fourteenth Amendment since the classification was based upon the desire to prevent the "abuses originating in the multiplicity of suits growing out of the gratuitous carriage of

141. *Id.*

142. *Id.*

143. See note 98 and accompanying text *supra*.

144. See note 102 and accompanying text *supra*.

145. "[N]o person transported by the owner or operator of a motor vehicle . . . as his guest without payment for such transportation shall have a cause of action for damages against such owner or operator for injury, death or loss, in case of accident, unless such accident was intentional on the part of such owner or operator, or was caused by his willful or wanton disregard of the rights of others." DEL. CODE ANN. tit. xxi § 6101(a). This statute was upheld as being consistent with the equal protection clause of the Fourteenth Amendment in *Justice v. Gatchell*, 325 A.2d 97 (Del. 1974). *Cf. Brown v. Merlo*, 8 Cal. 3d 855, 506 P.2d 212, 106 Cal. Rptr. 388 (1973).

146. *Justice v. Gatchell*, 325 A.2d 97, 99 (Del. 1974).

147. 280 U.S. 117 (1929).

passengers in automobiles."¹⁴⁸ It is difficult to see how an automobile guest statute provides an analogy for a statute which absolutely limits liability to between \$560 million to \$660 million. In contrast to the Price-Anderson Act, a guest statute does not erect an unconditional barrier for full compensation since it allows for recovery in accidents caused by "willful or wanton disregard of the rights of others."¹⁴⁹ Also, while a person generally has the option to decide whether he or she will become a nonpaying automobile passenger, that person does not necessarily have this choice in determining whether he will expose himself to the risk of radioactive contamination. Thus, fundamental dissimilarities exist which make analogization between the Price-Anderson Act and automobile guest statutes questionable.

Similarly, legislation exempting shipowners from liability for losses caused by fire "unless such fire is caused by the design or neglect of such owner or owners"¹⁵⁰ can be distinguished from the Price-Anderson Act. For one thing, the provisions of this statute are far narrower than those comprising the Price-Anderson Act. Under the "Act to limit the liability of Ship-Owners,"¹⁵¹ shipowners remain fully liable for losses caused by their negligence. Under the Price-Anderson Act, on the other hand, operators of nuclear reactors are not held fully accountable for accidents caused by their negligence.¹⁵² In addition, under the act limiting the liability of shipowners, the fact that shipowners remain liable to the extent of the value of their interest in the vessel and the freight then pending means that there is some relationship between the degree of liability and the amount of actual loss. In the event of a reactor

148. *Id.* at 123.

149. 42 U.S.C. § 2210(e)(1978); 10 C.F.R. § 140.11(a)(4). *See* note 62 *supra*.

150. On March 3, 1851, Congress enacted a statute entitled "An Act to limit the liability of Ship-Owners and for other Purposes," Ch. 43, 9 Stat. 635 (1851). The first section of that act provides: "That no owner or owners or any ship or vessel shall be subject or liable to answer for or make good to any one . . . any loss or damage which may happen to any goods or merchandise whatsoever, which shall be shipped, taken in, or put on board any such ship or vessel, by reason or by means of any fire happening to or on board the said ship or vessel, unless such fire is caused by the design or neglect of such owner or owners."

The third section of this act provides: "That the liability of the owner or owners of any ship or vessel for any embezzlement, loss, or destruction by the master, officers, mariners, passengers, or any other person or persons of any property, goods, or merchandise shipped . . . or for any loss, damage, or injury by collision, or for any act, matter or thing, loss damage, or forfeiture done, occasioned, or incurred without the privity or knowledge of such owner or owners shall in no case exceed the amount or value of the interest of such owner or owners respectively in such ship or vessel and her freight then pending."

151. *Id.*

152. 42 U.S.C. § 2210(e)(1978).

meltdown and release of a substantial amount of fission products, it is clear that the degree of liability would bear no such reasonable relationship to the amount of actual loss. Finally, the practical effect of the act limiting shipowners' liability is to shift the cost of insurance from the shipowner to the shipper. Under the Price-Anderson Act, in contrast, it is impossible for private individuals such as homeowners to obtain insurance against radioactive contamination.¹⁵³

The limited liability provisions of the Warsaw Convention¹⁵⁴ are similarly distinguishable from the Price-Anderson Act. Under the Warsaw Convention, the liability of an airline for injury to or loss of life of each passenger is limited to \$75,000.¹⁵⁵

In *Indemnity Insurance Co. of North America v. Pan American Airways*,¹⁵⁶ a United States District Court held that the Warsaw Convention's limitation on liability was not inconsistent with the due process clause of the Fifth Amendment since "[t]he public policy against contractual limitation of liability by common carriers . . . must bow to the overriding policy of the treaty."¹⁵⁷

Even though \$75,000 is not much in today's inflated economy, the fact that this figure applies to each individual passenger¹⁵⁸ would appear to provide for a reasonable scheme of compensation. In the case of the present \$660 million liability ceiling under the Price-Anderson Act,¹⁵⁹ an accident causing \$10 billion in damages to 40,000 people would result in compensation of only \$16,500 per

153. *Id.* § 3019. See PENNSYLVANIA INSURANCE DEP'T, CITIZEN'S BILL OF RIGHTS AND CONSUMER'S GUIDE TO NUCLEAR POWER (1973), reprinted in STAFF OF JOINT COMM. ON ATOMIC ENERGY, 93RD CONG., 2D SESS., SELECTED MATERIALS ON ATOMIC ENERGY INDEMNITY AND INSURANCE LEGISLATION 459 (Comm. Print 1974).

154. Convention for the Unification of Certain Rules Relating to International Transportation by Air, Oct. 12, 1929, 49 Stat. 3000, T.S. 876. See also 49 U.S.C. § 1502 (1970)(notes).

155. *Id.* On February 13, 1933, the Warsaw Agreement came into force. In pertinent part it provides: "In the transportation of passengers the liability of the carrier for each passenger shall be limited to the sum of 125,000 francs. . . . Nevertheless, by special contract, the carrier and the passenger may agree to a higher limit of liability." 49 Stat. 3000, 3019 (1929). By special agreement between participating carriers and the Civil Aeronautics Board, carriers going to or from an agreed stopping place in the United States are subject to a limit of liability of \$75,000 which includes the costs of litigation. See, e.g., 58 F. Supp. 338, 340 (S.D.N.Y. 1944). The Court cited *Conklin v. Canadian-Colonial Airways, Inc.*, 266 N.Y. 244, 194 N.E. 692 (1935). The rationale for this provision is that since the carrier can distribute the loss and obtain insurance to cover it, the loss can be better borne by the carrier than by the victim.

156. 58 F. Supp. 338 (S.D.N.Y. 1944).

157. *Id.* at 340.

158. See note 154 *supra*.

159. 42 U.S.C. § 2210(e)(1978). 10 C.F.R. 3140.11(a)(4)(1980). See note 62 *supra*.

person. In the absence of the liability ceiling, the individual pro rata recovery would be \$250,000. If only 20,000 people were injured as the result of a nuclear accident, the amount of individual compensation would double to \$33,000. Thus, the amount of compensation provided for under the Price-Anderson Act is made to depend upon the number of persons injured. The result is that, while the Warsaw Convention provides for a certain and specific level of compensation for the individual accident victim, the Price-Anderson Act provides for a fixed fund which makes the amount of individual compensation depend upon the number of persons injured.

The comparison of the Price-Anderson Act to worker's compensation statutes is similarly flawed. Generally, worker's compensation acts impose liability upon an employer for an employee's injury or death arising in the course of employment. Such acts require the employer to provide compensation to the employee or his family without regard to fault except where the injury is caused intentionally by the employee.¹⁶⁰ Moreover, the compensation for disability is fixed according to a graduated scale based upon loss of earning capacity.¹⁶¹

The constitutionality of worker's compensation acts was addressed by the United States Supreme Court in *New York Central Railroad Co. v. White*.¹⁶² There the Court held that a system of compensation which limits the amount of recovery does not violate the due process clause of the Fourteenth Amendment.¹⁶³ In response to the due process argument, the Court stated that although an "employee is no longer able to recover as much as before in case of being injured through the employer's negligence, he is entitled to moderate compensation in all cases of injury, and has a certain and speedy remedy without the difficulty and expense of establishing negligence in proving the amount of the damages."¹⁶⁴

The equal protection aspects of worker's compensation statutes were recently discussed by the United States Supreme Court in *Weber v. Aetna Casualty & Surety Co.*¹⁶⁵ Upholding the constitutionality of the Act against an equal protection challenge, the

160. See W. PROSSER, *LAW ON TORTS* 530-37 (1971).

161. See, e.g., S. HERLICK, *CALIFORNIA WORKER'S COMPENSATION HANDBOOK*, 211-31 (1978).

162. 243 U.S. 188 (1917).

163. *Id.* at 204-05.

164. *Id.* at 201. See also *Hawkins v. Bleakly*, 243 U.S. 210 (1917) in which the Court held that the Iowa Compensation Act which establishes a system of compensation according to a prescribed schedule does not violate the due process clause of the Fourteenth Amendment.

165. 406 U.S. 164 (1972).

Court stated, “[the] workmen’s compensation codes represent outgrowths and modifications of our basic tort law . . . [they] removed difficult obstacles to recovery in work-related injuries by offering a more certain, though generally less remunerative, compensation.”¹⁶⁶ The test to determine the validity of state statutes under the equal protection clause according to *Weber* is whether “a statutory classification bear[s] some rational relationship to a legitimate state purpose.”¹⁶⁷ Application of this “rational relationship” test in turn necessitates a dual inquiry: “What legitimate state interest does the classification promote? What fundamental personal rights might the classification endanger?”¹⁶⁸

Although worker’s compensation acts and the Price-Anderson Act both limit liability, several major differences outweigh their similarities. Under worker’s compensation, an accident victim is compensated for his or her individual loss according to a predetermined schedule. In contrast, under the Price-Anderson Act, compensation to an accident victim is dependent upon the number of individuals injured. The amount of a worker’s compensation payment, although limited by statute, is nonetheless certain, while under the Price-Anderson Act the amount of compensation is uncertain.

Another characteristic of worker’s compensation which distinguishes it from the Price-Anderson Act is the fact that under worker’s compensation there exists a contractual relationship between employer and employee. In theory at least, there has been a bargained-for exchange, or a *quid pro quo*. In return for giving up the legal right to sue his or her employer, the employee is guaranteed recovery in the event of injury—usually a monthly sum to compensate for lost earnings. Under the Price-Anderson Act, no such contractual relationship exists between a utility operating a nuclear reactor and a potential accident victim.

Another statutory scheme limiting liability is the National Swine Flu Immunization Program of 1976¹⁶⁹ (the “Swine Flu Act”). Under this Act, private providers of the Swine Flu vaccine are protected from liability for any injury or death suffered by inoculated individuals.¹⁷⁰ The Act abolishes all causes of action

166. *Id.* at 171-72.

167. *Id.* at 172.

168. *Id.* at 173.

169. 42 U.S.C. § 247b (1978 & Supp. 1980).

170. The Swine Flu Act applies to three categories of “program participants” which are defined as (1) manufacturers or distributors of the vaccine; (2) public or private agencies that provide an inoculation without charge and with informed consent; and (3) medical or

against private manufacturers, distributors and providers of the vaccine and makes a tort action against the United States the only remedy.¹⁷¹ Significantly, a cause of action brought against the United States is not subject to monetary limitations.¹⁷²

The constitutionality of the Swine Flu Act was upheld by a United States District Court in *Sparks v. Wyeth Laboratories, Inc.*¹⁷³ The court held that insofar as it abolishes a cause of action against a program participant and substitutes an alternative, efficacious remedy against the United States, "the Swine Flu Act comports with the due process clause of the Fifth Amendment."¹⁷⁴ Citing *Swanson v. Bates*,¹⁷⁵ the Court in *Sparks* stated: "[n]o one has a vested right in a given mode of procedure and so long as a substantial and efficient remedy is provided, due process of law is not denied by a change of remedy."¹⁷⁶

The Swine Flu Act is easily distinguished from the Price-Anderson Act. The major difference between the two statutes is that under the Swine Flu Act the United States assumes full responsibility for injuries caused by the vaccine.¹⁷⁷ Under the Price-Anderson Act the United States assumes only partial liability in the form of the \$500 million indemnification provision.¹⁷⁸

It is thus apparent that the Price-Anderson Act is not substantially analogous to other limitations on liability. The Price-Anderson Act is unique in making the amount of compensation an individual can recover dependent upon the total number of accident victims. This fact may in itself make the relief afforded by the Act arbitrary and irrational. It appears that the Supreme Court's real purpose in upholding the Act was to shield the nuclear power industry from potential bankruptcy.

other health personnel who provide an inoculation without charge and with the informed consent of the recipient. *Id.* § 247b(k)(2)(B). The provisions of the Swine Flu Act which are particularly relevant include: (1) the creation of a cause of action against the United States for any personal injury or death arising out of the act or omission of a program participant, *Id.* § 247b(k)(2)(A); (2) the abolition of a cause of action against program participants by making the cause of action against the United States the exclusive remedy, *Id.* § 247b(k)(3); and (3) the application of the procedures of the Tort Act to actions brought against the United States. *Id.* § 247(k)(2)(A).

171. *Id.*

172. *Id.*

173. 431 F. Supp. 411 (W.D. Okla. 1977).

174. *Id.* at 416.

175. 170 F.2d 648 (10th Cir. 1948).

176. 431 F. Supp. at 416.

177. See note 170 *supra*.

178. See note 7 and accompanying text *supra*.

Conclusion

While the Price-Anderson Act continues to encourage the development of nuclear power, the Act fails to achieve its stated objective of protecting the public. In light of the possibility that the amount of damage will exceed the amount of compensation paid to accident victims, the Act should be amended to provide for full liability. If nuclear power is indeed as safe as the NRC and the nuclear industry claim, then there is no reason to protect the nuclear industry from full liability. The fact that Congress is not willing to provide for full liability indicates that it is not confident in government and industry safety statistics. Congress' failure to amend the Act, in turn, supports the conclusion that nuclear power needs to be protected since it is inherently unsafe. This lack of confidence in the safety of nuclear power underscores the necessity for providing full compensation to nuclear accident victims.

It is clear that the present compensation system has subverted one of the basic tenets of the common law—that one is responsible for the full consequences of one's acts.¹⁷⁹ By placing the burden of loss for acts of the nuclear industry, not on the shoulders of the industry, but on the shoulders of accident victims, the Price-Anderson Act subsidizes nuclear industry. Because of the necessity of guaranteeing that nuclear accident victims will be fully compensated for their losses, full liability for nuclear accidents should be borne by the owners of nuclear installations. It follows that abandonment of the Price-Anderson Act's limited liability subsidy would advance the Act's purpose of providing public protection by letting the forces of the market place determine the future of nuclear power.

179. *Trull v. Carolina-Virginia Well Co.*, 264 N.C. 687, 691, 142 S.E.2d 622, 624 (1965).