Abolishing the "Extraordinary Nuclear Occurrence" Threshold of the Price-Anderson Act

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The Price-Anderson Act\(^1\) establishes a federal system of private insurance, government indemnity, and limited liability for the civilian nuclear power industry. Among the Act's provisions is a scheme to enhance protection of the public from nuclear accidents by requiring nuclear plant owners to waive certain defenses they might otherwise have under local tort law.\(^2\) These waiver provisions apply, however, only when the Nuclear Regulatory Commission determines that the accident exceeds a threshold of overall severity described as an "extraordinary nuclear occurrence."\(^3\) In the one application of the threshold provision to date, the 1979 accident at the Three Mile Island Nuclear Plant near Middletown, Pennsylvania, the Nuclear Regulatory Commission determined that the accident was not an extraordinary nuclear occurrence.\(^4\) In light of estimated losses of $18 million for residents within fifteen miles of the plant,\(^5\) the Three Mile Island incident calls into question the policies underlying the threshold provisions, and illustrates the need for reform.

This article critically examines the extraordinary nuclear occurrence threshold in light of its congressional purpose. Part I surveys the Price-Anderson Act's nuclear liability scheme. Part II focuses on the extraordinary nuclear occurrence threshold, scrutinizing its content and its application to the Three Mile Island accident. Part III discusses the need for reform of the nuclear liability waiver of defenses scheme, concluding that the threshold should be abolished.


\(^{4}\) See notes 53-54 and accompanying text infra.

\(^{5}\) See note 62 and accompanying text infra.
I. THE PRICE-ANDERSON ACT

Prior to 1954, the federal government held an absolute monopoly on atomic energy development, which was at that time an exclusively military endeavor. The Atomic Energy Act of 1954 ended the government monopoly in an attempt to encourage the development of atomic energy by private industry for electric power generation, under strict regulation by the Atomic Energy Commission (AEC). The private sector, however, was unwilling to invest heavily in the new technology, in part because of the enormous potential liability it would face under traditional tort law in the event of a serious nuclear accident. Concerned that the United States would be overtaken in the nuclear race, Congress passed the Price-Anderson Act in 1957.

A. Protecting the Nuclear Industry: Limitations on Licensee Liability

The Price-Anderson Act has two principal goals: protection of the public by assuring the availability of funds to satisfy accident claims, and protection of the nuclear industry by removing the threat of tremendous potential liability. Most of the provi-
sions of the original Act were directed towards the latter goal, emphasizing the role of private insurers with government acting as a back-up. The Act, for example, requires operators of production size reactors to obtain the maximum amount of insurance available from private sources to cover public liability. It further provides that should public liability from an accident exceed the amount of private insurance coverage, the AEC would indemnify the licensee for an additional amount of $500 million. Another controversial provision of the original Act limits the aggregate liability for a single nuclear accident to $560 million. When Congress extended the Price-Anderson Act for a third ten-year period in 1975, it added a third layer of liability protection, designed to come into play after the private insurance is exhausted, but before the liability of the federal government is invoked. In the event of an accident at any licensed facility for


18 42 U.S.C. § 2210(b) (1976). The private insurance industry organized into two nuclear liability insurance pools. At the time the Price-Anderson bill was enacted the pools agreed to provide coverage of $60 million for liability to the public from a single nuclear accident. That amount has increased over the years to a present level of $160 million. 10 C.F.R. § 140.11(a)(4) (1980).


16 42 U.S.C. § 2210(e) (1976). The limitation engendered a great deal of controversy because of claims that the release of radioactivity from a "worst case" accident could cause damage to the public many times greater than the liability limit. The most recent study estimated the average consequences of the worst category of accident examined would be 3,500 fatalities and 45,000 radiation injuries within one year, 45,000 delayed cancer fatalities, 240,000 delayed thyroid injuries, 5,100 inherited disorders in offspring of the irradiated population, and property damage of $14 billion. NRC, Reactor Safety Study: An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants 83 (WASH-1400) (NUREG 75/014) (1975). These casualty figures and the Reactor Safety Study as a whole have been severely criticized as understating the true potential consequences of serious accidents. See, e.g., sources cited in Note, Nuclear Power and the Price-Anderson Act: Promotion Over Public Protection, 30 Stan. L. Rev. 393, 431-38 (1978). In response to this criticism and an internal review, the NRC formally repudiated the Executive Summary of the Reactor Safety Study and acknowledged its methodology and peer review procedure as inadequate. Office of Pub. Aff., NRC, News Release 79-19, Nuclear Regulatory Commission Issues Policy Statement on Reactor Safety Study and Review by Lewis Panel(1979).


which public liability exceeds the amount of private insurance available, a retrospective rating plan assesses deferred premiums of $2-5 million per reactor on all licensees in the country. Thus, every reactor operator in the country can be liable for up to $5 million for an accident at any plant. Imposing this liability on the industry displaces the liability of the federal government under its indemnification agreements, and eventually will increase the aggregate compensation above the $560 million level as more reactors are commissioned. The amendments also provide for government assurance of the deferred premium funds in case any licensees are unable to pay them promptly for any reason.


Hearings held by the congressional Joint Committee on Atomic Energy in 1965 identified two potentially significant sources of legal uncertainty in case of reactor accidents: (1) the standard of liability; and (2) whether the applicable state statute of limitations would cut off claims of radiation-injured claimants without allowance for the long latency periods of most radiation injuries. In 1966, the Joint Committee held hearings to probe the extent of these problems, and subsequently reported a bill which Congress enacted that same year. After considering a variety of other statutory solutions, Congress adopted a se-

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17 The amount of private insurance available from the pools has gradually increased over the years to a present level of $160 million. See 10 C.F.R. § 140.11(a)(4) (1980).
19 If the amount of private insurance available remains at the present $160 million level, government indemnity will be eliminated completely when there are 80 licensed reactors (80 × $5 million = $400 million industry liability + $160 million private insurance = $560 million aggregate compensation). Thereafter, each additional license will add $5 million to the aggregate compensation fund.
25 For example, the Joint Committee considered and rejected the idea of enacting a new body of federal tort law because of perceived difficulties of administration and strong opposition from the nuclear and insurance industries. H.R. Rep. No. 2043, supra note 23, at 8-10.
Torts scholars generally believed that the doctrine of strict liability should be uni-
ries of provisions requiring nuclear energy producers to waive various defenses otherwise available under state law.\textsuperscript{36}

Subsection (i) of the waiver provisions requires licensees to waive the defenses of lack of negligence, contributory or comparative negligence, and assumption of risk. This provision accomplishes a result similar to a rule of strict liability, even in jurisdictions which do not recognize that doctrine or would not apply it to operation of a nuclear plant.\textsuperscript{37}

Subsection (iii) requires licensees to waive any defense based on state statutes of limitation, as long as claims are filed within three years of discovery of injury and within twenty years of the nuclear accident.\textsuperscript{38} This provision protects claimants for up to twenty years against having their suits barred by statutes of limitation in jurisdictions which hold that a cause of action accrues for more than a limited period of time after the nuclear accident.\textsuperscript{39}

formally applied in the event of a nuclear accident. Dean Prosser has noted, for example:

\begin{quote}
[T]he first case raising the question as to the use of nuclear energy has yet to reach the courts. When it does, it may be predicted with a good deal of confidence that this is an area in which no court will, at last, refuse to recognize and apply the principle of strict liability. . . .
\end{quote}


However, the Committee perceived that the issue of whether strict liability would be applied could be a source of legal uncertainty and disparate treatment of claimants, because only a few states had adopted the strict liability doctrine in 1965 while several had explicitly rejected it. Even in those jurisdictions which had accepted the doctrine, it was uncertain whether it would be applied to the nuclear power industry. \textit{Id.}

\textsuperscript{36} \textit{See note 24 supra}. The amendments authorize the AEC (NRC) to require that both indemnity agreements with licensees and private insurance policies include waivers of:

(i) any issue or defense as to conduct of claimant or fault of persons indemnified,
(ii) any issue or defense as to charitable or government immunity, and
(iii) any issue or defense based on any statute of limitations if suit is instituted within three years from the date on which the claimant first knew, or reasonably could have known, of his injury . . . . and the cause thereof, but in no event more than twenty years after the date of the nuclear incident.


Subsection (ii), not discussed in the text, is designed to benefit victims of incidents at nuclear research facilities of public universities or at government nuclear installations.

\textsuperscript{37} By requiring waivers of contributory or comparative negligence and assumption of risk, the provision actually goes somewhat beyond traditional strict liability, which sometimes allows those defenses. \textit{See W. Prosser, supra note 25, § 79, at 522-24}. On the other hand, the waivers expressly do not apply to a defense based on plaintiff's failure to take reasonable steps to mitigate damages or plaintiff's intentional acts causing his injury or wrongfully causing the nuclear incident. 42 U.S.C. § 2210(n)(1) (1976).

\textsuperscript{38} 42 U.S.C. § 2210(n)(1) (1976). A 1975 amendment extended the cutoff period from ten to twenty years. \textit{Id.}
at the time of the wrongful act of the defendant. However, it does not limit claims in jurisdictions with more liberal statutes of limitations, such as those which have adopted the discovery rule, since in such situations the defendant will not yet have any defense to waive.

A handful of other provisions also attempt to enhance the public protection element of the Price-Anderson Act. A provision added by the 1966 amendments authorizes the Commission to “enter into agreements with other indemnitors to establish coordinated procedures for the prompt handling, investigation, and settlement of claims for public liability.” This provision authorizes the Commission or private insurers to make prompt payments to claimants without securing releases “for the purpose of providing immediate assistance following a nuclear incident.” Another provision establishes a scheme for federal court apportionment of the compensation fund if it appears that public liability from a single nuclear incident may exceed the $560 million liability limit.

A 1965 study of state statutes of limitations revealed that in the majority of states, the cause of action accrued at the time of the wrongful act of the defendant, without regard to whether or not the claimant knew or could reasonably know of his or her injury. See Edward J. Bloustein, The Statutes of Limitations Applicable to Common Law Recovery for Radiation Injuries, reprinted in Waiver Hearings, supra note 23, at 218, 222.

Many radiation injuries have long latency periods which do not manifest themselves for as long as twenty or thirty years. In states which adhere to the “time of the wrongful act” rule, the latent radiation injury claims of nuclear accident victims would probably be barred by the statute of limitations, because in most states claims must be filed within three years of the accrual of the cause of action. Id. at 219-20.

In 1965, a small minority of the states adhered to the “discovery rule,” under which a cause of action for personal injury accrued when the claimant first knew, or reasonably could have known, of his or her injury and its cause. Id. at 223. The “discovery” rule is particularly well suited to radiation injuries since it accounts more fairly for the problem of knowing whether or not one is injured before the manifestations appear. 31 ALA. L. REV. 509, 513 (1980) (discusses a recent Alabama Supreme Court decision, Garrett v. Raytheon Co., 368 So. 2d 516 (Ala. 1979), refusing to apply the discovery rule and thus barring a radiation injury claim on the basis of a one-year statute of limitations). Although more states now adhere to the discovery rule, see, e.g., Louisville Trust Co. v. Johns-Manville Products Corp., 580 S.W.2d 497 (Ky. 1979); Raymond v. Eli Lilly & Co., 117 N.H. 164, 371 A.2d 170 (1977); Gilbert v. Jones, 523 S.W.2d 211 (Tenn. 1974), a few states persist in applying the “time-of-the-wrongful-act” rule. See, e.g., Garrett v. Raytheon Co., 368 So. 2d 516 (Ala. 1979); Thornton v. Roosevelt Hospital, 47 N.Y.2d 780, 391 N.E.2d 1002, 417 N.Y.S.2d 920 (1979). See also Birnbaum, Statutes of Limitations in Environmental Suits: The Discovery Rule Approach, TRIAL, April 1980, at 38.


Id. § 2210(o). If the federal district court in the district where the accident occurs determines, upon the petition of any interested party, that the liability limit might be exceeded, the court must approve any indemnity payments in excess of fifteen percent of the liability limit. Id. § 2210(o)(1). In addition, the Commission shall, and any other
The 1966 amendments also granted original jurisdiction to the federal district court of the district where the accident occurred for public liability claims arising from an extraordinary nuclear occurrence. Finally, the 1975 amendments directed Congress to thoroughly review any nuclear incident causing damage in excess of the applicable liability limit.

II. THE TRIGGER TO WAIVER: THE EXTRAORDINARY NUCLEAR OCCURRENCE THRESHOLD

A. The Threshold Defined

The modifications of tort law described in the preceding section do not apply to all "nuclear incidents." The Price-Anderson Act provides that the waivers are to come into effect only for those serious nuclear incidents which the Commission characterizes as "extraordinary nuclear occurrences." An extraordinary nuclear occurrence is defined as "any event causing a discharge or dispersal . . . of source, special nuclear, or byproduct material . . . or causing radiation levels offsite, which the Commission determines has resulted or will probably result in substantial damages to persons offsite or property offsite." The Commission's determination is not reviewable by any agency or court.

Congress directs the NRC to establish written criteria further defining the extraordinary nuclear occurrence threshold. The Commission's extraordinary nuclear occurrence regulations

interested party may, submit to the court a plan for the appropriate disposition of the remaining funds, including withholding of a portion thereof for possible latent injury claims which may not be discovered until a later time. Id. § 2210(o)(3).

This provision was enacted in response to the criticism that victims of a "worst case" accident might be compensated at a rate of only a few cents per dollar of losses as a result of the liability limit. This amendment is a congressional promise to at least consider providing additional compensation on an ad hoc basis. For the view that this provision adds no substantive protection for nuclear accident victims, see Note, supra note 15, at 408-09.

The Act defines "nuclear incident" as "any occurrence . . . causing . . . bodily injury, sickness, disease, or death, or loss of or damage to property, or loss of use of property, arising out of or resulting from the radioactive, toxic, explosive, or other hazardous properties of source, special nuclear, or byproduct material." 42 U.S.C. § 2014(q) (1976).

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provide a two-part test for the threshold. The first criterion is satisfied if one or more persons were, could have been, or might be exposed to a specified dosage of radiation per critical organ or if a specified amount of radiation has contaminated offsite property. If the Commission determines that either component of the first test is met, then it will consider the second test: whether the event has resulted or will probably result in substantial damages to persons or property offsite. The meaning of “damage” under the regulations is restricted to losses resulting from the hazardous properties of radioactive materials or from protective actions to avoid exposure thereto.

The first criterion states:

The Commission will determine that there has been a substantial discharge or dispersal of radioactive material offsite, or that there have been substantial levels of radiation offsite, when . . . radioactive material is released from its intended place of confinement or radiation levels occur offsite and either of the following findings are also made:

(a) The Commission finds that one or more persons offsite were, could have been, or might be exposed to radiation or to radioactive material, resulting in a dose or in a projected dose in excess of one of the levels in [a specified] table . . . .

(b) The Commission finds that—

1. Surface contamination of . . . any 100 square meters of offsite property has occurred as the result of a release of radioactive material from a production or utilization facility and such contamination is characterized by levels of radiation in excess of the values listed in [another specified table], or

2. Surface contamination of any offsite property has occurred as the result of a release of radioactive material in the course of transportation and such contamination is characterized by levels of radiation in excess of one of the values listed in [the second specified table].

Id. § 140.84.

A positive determination will be made if any of the following are established:

1. . . . the death or hospitalization, within 30 days of the event, of five or more people located offsite showing objective clinical evidence of physical injury from exposure to the radioactive, toxic, explosive, or other hazardous properties of [nuclear] materials; or

2. . . . $2,500,000 or more of damage offsite . . . sustained by any one person, or $5 million or more . . . damage in the aggregate; or

3. . . . $5000 or more . . . damage offsite . . . sustained by each of 50 or more persons, provided that $1 million or more . . . damage in the aggregate has been or will probably be sustained. . . .

Id. § 140.85(a).

The regulations define damage as that arising out of or resulting from the radioactive, toxic, explosive, or other hazardous properties of source, special nuclear, or byproduct material and shall be based upon estimates of one or more of the following:

1. Total cost necessary to put affected property back into use,

2. Loss of use of affected property,

3. Value of affected property where not practical to restore to use,

4. Financial loss resulting from protective actions appropriate to reduce or avoid exposure to radiation or to radioactive materials.

Id. § 140.85(b).
The legislative history of the waiver provisions reveals two rationales which were offered for the threshold. The first, and more important of these was fear that application of the waivers to all “nuclear incidents” would encourage “nuisance” suits. This was the rationale offered by the Joint Committee on Atomic Energy and the one most often mentioned by supporters of the threshold during hearings.

The second rationale offered for the threshold was that limit-

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48 The Senate Report on the amendments states that inclusion of the concept stems in major part from the desire of industry to preserve its customary legal defenses in situations where nothing untoward or unusual has occurred in the conduct of nuclear activities. . . .

[T]here is no pressing need to invoke . . . the special waivers in situations which are not exceptional and which can well be taken care of by the traditional system of tort law. . . . For this reason, and for the additional purpose of helping to assure that the waiver system will not be invoked in case of nuisance suits, the Committee believes that a reasonable threshold should be satisfied before the special waiver provisions . . . become operative.

S. REP. No. 1605, supra note 12, at 11.

49 E.g., Waiver Hearings, supra note 23, at 23 (statement of Joseph F. Hennessey) (“it would cause considerable concern to the insurers . . . if the nuisance suit were permitted to have the advantages of the waiver of these defenses”).

Mr. Hennessey, General Counsel of the AEC, later testified:

[T]he insurance companies have . . . accumulated some dread of the nuisance claim and the fake claim, and the purpose of establishing a threshold is to eliminate from this system the occasion where a few people in the neighborhood of a nuclear power plant who contract diseases, or may think they have, will assert claims against the utility. . . .

. . . The purpose is to take care of the situation where you have a small number of nuisance claims and not give those people the advantage of the waiver of defenses.

I think apart from that reason I know of no other for setting up this specially defined term, “extraordinary nuclear occurrence.”

Id. at 78 (emphasis added).

An attorney for a prominent nuclear utility testified: “[I]t is very significant that the waivers be limited to extraordinary nuclear occurrences. In the absence of this it would be an invitation for nuisance suits. . . .” Id. at 50 (statement of Arthur Gehr).

Similarly, a representative of the nuclear insurance pools which provide the private coverage stated: “The minor incident, the nuisance claim, are all claims if possible which should be kept from this regime.” Id. at 122 (testimony of DeRoy C. Thomas).

Two members of the staff of the Joint Committee on Atomic Energy likewise identified the desire to exclude nuisance suits as the major reason for the threshold in an article about the waiver legislation. They wrote:

The inclusion of the concept . . . stemmed in major part from the desire of industry to preserve its customary legal defenses in situations where nothing untoward or unusual has occurred. . . . The desire of industry to retain its defenses is grounded on the fear that victims of diseases such as cancer—which may be caused by, among other things, ionizing radiation—who live in the vicinity of reactors might charge that their infirmities were caused by the tiny amounts of radioactive gases which the AEC has determined may be emitted from a reactor’s stack without endangering the public health and safety.

ing the waivers to only serious accidents is consistent with the Act's purpose of protecting the public from the consequences of catastrophic nuclear accidents.\textsuperscript{47} Although the waivers would apply to less-than-catastrophic accidents, Congress chose to require "substantial" radiation releases and damages as a trigger to the waiver scheme.\textsuperscript{48} Congress, however, decided not to define "substantial" statutorily because of "the difficulty of fixing a definition which would be suitable for a wide variety of circumstances," and instead authorized the Commission to develop a suitable definition.\textsuperscript{49}

B. The Threshold in Practice: Three Mile Island as a Non-Extraordinary Occurrence

The waiver of defenses scheme created by the Price-Anderson Act constitutes a significant start toward improving the public protection component of the overall federal nuclear accident liability scheme.\textsuperscript{50} A puzzling problem is why the application of these useful liberalizations of tort law should be afforded only to victims of very serious accidents, leaving victims of lesser accidents to cope with the very vicissitudes of state tort law which the waiver of defenses provisions were designed to avoid.

The inadequacy of the threshold requirement became quite apparent in its only application to date, the notorious accident at Three Mile Island. In the spring of 1979, the most serious accident in the history of civilian nuclear power occurred at Unit 2 of the Three Mile Island Nuclear Power Plant.\textsuperscript{61} The Three Mile Island (TMI) accident clearly satisfied the qualitative norms of the regulations. By virtually any standard, "something exceptional" occurred; the incident was "untoward and unexpected."\textsuperscript{62} Nevertheless, the NRC's final determination in April, 1980, was that the TMI accident did not constitute an extraordinary nuclear occurrence under the quantitative requirements of

\textsuperscript{47} S. Rep. No. 1605, supra note 12, at 11.
\textsuperscript{49} S. Rep. No. 1605, supra note 12, at 12.
\textsuperscript{50} For the view that the waivers do not substantially benefit nuclear accident victims because most of the defenses waived could not be successfully asserted under prevailing rules of law, see Note, supra note 15, at 410-18.
\textsuperscript{61} Three Mile Island is a two-unit nuclear facility operated by the Metropolitan Edison Co. near Middletown, Pennsylvania. See generally 1 Special Inquiry Group, NRC, Three Mile Island, A Report to the Commissioners and to the Public 1-4, (Mitchell Rogovin, Director, 1980) [hereinafter cited as Rogovin Report].
\textsuperscript{62} 10 C.F.R. § 140.81(b)(3) (1980).
its regulations. Although conceding that “in ordinary parlance” the accident was “extraordinary,” the Commission nonetheless found that the radiological releases did not rise to the levels required for an extraordinary nuclear occurrence under its regulations.

A survey of some of the undisputed events and consequences of the TMI accident illustrates the gross discrepancy between the articulated purpose of the threshold and the result of its application in practice. The incident had all the earmarks of disaster. Two days into the accident, because of uncertainty concerning the possibility of uncontrolled radiation release, the Governor of Pennsylvania advised pregnant women and preschool age children within five miles of TMI to leave the area. Ninety-three percent of that group complied with the advice. Officials of the NRC, the utility, and the state government considered immediate major evacuation of the area several times during the accident. At one point, a county official announced over a local radio station that evacuation was imminent. Although no official, general evacuation was ordered, approximately 144,000 people, 39 percent of those living within 15 miles of the plant, voluntarily left the region.

A survey commissioned by the NRC estimated that within 15 miles of the plant, 34,000 evacuees lost 141,000 person-days of work. Of those who lost work, 19,000 also lost pay. If approximately $1.2 million of already paid insurance compensation is subtracted from income loss and accident-related expenses, short term, uncompensated losses borne by households within 15 miles of TMI as of August 10, 1979, were about $18 million, of

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88 Metropolitan Edison Co., 11 N.R.C. 519 (1980). This determination is not reviewable before any tribunal. 42 U.S.C. § 2014(j) (1976). One commentator has suggested that the provision eliminating judicial review might be unconstitutional. See Note, supra note 15, at 428.


85 2 Rogovin Report, supra note 51, at 1013-14. The Governor did not officially lift the evacuation advisory for ten days. Id. at 1016.

86 Id.

87 Id. at 1010-14.

88 Id. at 1012.

89 Id. at 1016. The median length of time evacuees remained out of the area was five days. They traveled an average distance of 100 miles. Id.

90 Id. at 633.

91 The median pay loss for this group was $110; the mean loss was $271. Eleven percent reported losing more than $500. Id.
which total evacuation costs represented some $8.8 million.\textsuperscript{62} Total income losses of evacuees and nonevacuees were estimated to be $9.3 million.\textsuperscript{63}

Despite the compelling evidence of substantial adverse consequences to the public, the TMI accident failed to satisfy the NRC criteria for offsite radiation doses to humans or radioactive contamination of property and, therefore, was not an extraordinary nuclear occurrence. Even if the radiation level requirements had been met, however, it is not clear that the TMI accident would have satisfied the damage requirements\textsuperscript{64} because of the narrow conception of damage implicit in the threshold concept, and made explicit in the regulations.\textsuperscript{65}

The extraordinary nuclear occurrence criteria contemplate only damages which are the direct consequence of actual physical exposure to nuclear materials or the avoidance thereof.\textsuperscript{66} The TMI experience demonstrates graphically that nuclear accidents can result in substantial losses without exposure to high levels of radiation. Besides the economic costs already mentioned, the TMI victims suffered a variety of health-related harms.\textsuperscript{67} Psychological distress, for example, said to be the most significant health effect of the accident, remained high in the area around TMI for many months after the height of the accident.\textsuperscript{68} The costs borne by the victims of TMI\textsuperscript{69} were not caused by exposure to radiation, but they were no less "caused" by the accident than if they had resulted from actual radiation exposure. Apprehension, and the expenses it engenders, are unavoidable costs of a nuclear accident. Nevertheless, the losses of TMI victims may

\textsuperscript{62} Id. at 635. It is noteworthy that the $18 million figure does not include any of the more controversial alleged damages from TMI such as reduction of property values, psychological distress, or slightly enhanced probability of disease in the future. It also does not include the losses of the much larger number of people outside the 15-mile radius who were adversely affected by the accident.

\textsuperscript{63} Id. at 638.

\textsuperscript{64} 10 C.F.R. § 140.85(a) (1980); see note 43 and accompanying text supra.

\textsuperscript{65} See STAFF ENO REPORT, supra note 54, at 30.

\textsuperscript{66} 10 C.F.R. § 140.85(b) (1980); see note 44 and accompanying text supra.

\textsuperscript{67} By most assessments the release of radioactivity at TMI will probably not result in any statistically noticeable public health effects other than psychological distress. 2 ROGOVIN REPORT, supra note 51, at 407-08. This is not to deny, however, that some additional individuals may contract cancer who would not have done so in the absence of the accident. It is only to say that the number of such individuals will not be great enough to be noticed statistically among the population at risk. The Rogovin Report concluded from several studies that the maximum offsite does to any individual was less than 100 millirems, and that the expected additional incidence of death from cancer would be less than one. Id.

\textsuperscript{68} Id. at 630-33.

\textsuperscript{69} See note 62 and accompanying text supra.
not fall within the categories of damage enumerated in the regulations; it is not clear that the voluntary TMI evacuations would be considered "appropriate" actions to reduce or avoid exposure to radiation.70

The failure of the NRC to declare TMI an extraordinary nuclear occurrence may not preclude the victims from obtaining relief. The TMI victims have already negotiated an extensive settlement,71 and Pennsylvania tort law is relatively favorable to the type of claims TMI plaintiffs would be likely to bring, with or without the Price-Anderson waivers of defenses.72 The extraordinary nuclear occurrence requirement has significant potential for mischief nonetheless.

Consider, for example, a hypothetical accident involving a substantial release of radiation occurring at the Browns Ferry Nuclear Generating Plant near Decatur, Alabama.73 In such an

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70 See 10 C.F.R. § 140.85(b)(4) (1980); Staff Enquiry Report, supra note 54, at 34.

71 The proposed settlement, however, provides mainly for economic losses, with only 20 percent of the funds going into a "public health fund." See Nat'L L.J., March 9, 1981, at 9, col. 1.

72 Pennsylvania courts have adopted the doctrine of strict liability for "abnormally dangerous activities" set forth in section 519 of the Restatement (Second) of Torts. Federoff v. Harrison Construction Co., 362 Pa. 181, 66 A.2d 817 (1949). There is reason to believe that a state which accepts the doctrine will apply it to operation of a nuclear plant. See note 25 supra. Even if courts applying Pennsylvania law do not apply strict liability in this context, TMI claimants' causes of action should not be impossible to maintain because there is ample documented evidence of negligence in the TMI accident. See generally, Rogovin Report, supra note 51. Thus, the Act's waiver of defenses as to fault is apparently not critical to TMI claimants.

Furthermore, Pennsylvania has recognized the "discovery rule" with respect statutes of limitations, holding that where knowledge of injury is impossible because of the laws of nature, the statute should begin to run from the time of discovery of the injury. See Med-Mar, Inc., v. Dilworth, 214 Pa. Super. 402, 257 A.2d 910 (1969).

The TMI plaintiffs should also fare adequately well without the special jurisdictional provision of the Price-Anderson Act, 42 U.S.C. § 2210(n)(2) (1976). A recent memorandum decision of the United States District Court for the Middle District of Pennsylvania (involving the largest consolidated class action suit arising from the TMI accident), held that although the NRC had determined that the TMI accident was not an extraordinary nuclear occurrence, federal jurisdiction was present under the statute granting district courts original jurisdiction of any civil action "arising under any Act of Congress regulating commerce," 28 U.S.C. § 1337 (Supp. III 1979). In re Three Mile Island Litigation, 87 F.R.D. 433 (M.D. Pa. 1980).

The jurisdictional issue might yet haunt claimants if their cases were appealed to the United States Supreme Court. The Court has not been eager to find implied private rights of action "arising under" federal statutes in recent years, see Transamerica Mortgage Advisors, Inc. v. Lewis, 444 U.S. 11 (1979); Touche Ross & Co. v. Redington, 442 U.S. 460 (1979), and might well disagree with the district court's holding on that issue.

73 The example is not far-fetched. The Browns Ferry Plant did have a very serious accident in 1975. A worker with a candle accidentally started a control cable fire which burned for seven hours and rendered some of the plant's safety systems inoperative. A makeshift reactor cooling system was quickly devised which averted a meltdown, but "there are experts who believe that Browns Ferry was as close as a few hours away from
event, a victim's radiation injury claim might well be barred by the Alabama statute of limitation even before the NRC determined whether the accident was an extraordinary nuclear occurrence.\footnote{In the TMI case, more than a year elapsed between the beginning of the accident and the NRC's determination that it was not an extraordinary nuclear occurrence. The Alabama statute of limitations for such radiation injury claims is one year, beginning at the time of the exposure. Garrett v. Raytheon Co., 368 So. 2d 516 (Ala. 1979); ALA. CODE § 6-2-39(a)(5) (1979). The Alabama statute was recently amended so that a victim can bring a product liability claim, including damages from latent radiation injuries not "resulting from a sudden and fortuitous trauma," against the original seller within one year of its discovery by reasonable diligence. See, id. § 6-5-502 (Supp. 1980). However the action must still be brought within ten years from the date the product was put into use or required to be repaired by a governmental agency. Id. See also 31 ALA. L. REV. 509 (1980).} If the determination was negative (the accident did not satisfy the threshold), the victim would be without a remedy no matter how serious the injury or how meritorious the claim. If the accident did satisfy the threshold, the Act's waiver scheme preserves the victim's cause of action, but only for twenty years.\footnote{42 U.S.C. § 2210(n)(1) (1976).} If the victim contracts cancer during that period, she must prove that her cancer was caused by the radiation she received from the accident in order to recover — a virtually impossible undertaking unless many of her neighbors are similarly afflicted.\footnote{See text accompanying note 97 infra.} If her cancer is not diagnosed until more than twenty years after the accident, she is once again without remedy, even if she can prove the accident was the cause.

The above example demonstrates some of the deleterious effects of the threshold that might be expected under circumstances less fortuitous than in the TMI case. The Alabama statute of limitations yields precisely the kind of harsh result which the waivers were supposed to remedy, yet the threshold denies that relief on the basis of a classification unrelated to the merit of the claim. The classification is both overinclusive, in that it denies benefits of the waivers to meritorious claims, and underinclusive, in that it affords the waivers to spurious claims arising from more serious accidents. As the Alabama example shows, the threshold contravenes the congressional purpose of improving protection of the public by potentially denying that protection in exactly the kind of situation in which it is most needed.

III. ABOLISHING THE THRESHOLD REQUIREMENT

A. Administrative Reform

The Three Mile Island experience highlights the need for reform of the extraordinary nuclear occurrence threshold. Application of the threshold to the Three Mile Island incident revealed a number of serious flaws in the current statutory scheme, a central flaw being the lack of "fit" between the Commission's qualitative and quantitative standards. The current conceptual framework might be tolerable if the threshold were set low enough to exclude only truly inconsequential "incidents." But the radiation doses required by the first test of AEC criteria are very high — in one instance higher by a factor of 200 than the legally permissible dose to an offsite individual. Although the regulations state that the test is designed to assure that something "exceptional" and "untoward and unexpected" has occurred, the Three Mile Island incident illustrates that the quantitative regulations do not correspond to this goal.

The problems presented by the extraordinary nuclear occurrence requirement could be mitigated by changing the substantive definition of the threshold. The Public Citizen Litigation Group and the Critical Mass Energy Project have filed a petition for rulemaking with the NRC asking the Commission to alter or amend the extraordinary nuclear occurrence criteria to bring them more into line with the intent of Congress. The petition

77 10 C.F.R. § 140.84 (1980). See note 42 and accompanying text supra.
78 NRC Standards for Protection Against Radiation require that:
no licensee shall possess, use or transfer licensed material in such a manner as to create in any unrestricted area from radioactive material and other sources of radiation in his possession:
(1) Radiation levels which, if an individual were continuously present in the area, could result in his receiving a dose in excess of two millirems in any one hour, or
(2) Radiation levels which, if an individual were continuously present in the area, could result in his receiving a dose in excess of 100 millirems in any seven consecutive days.
10 C.F.R. § 20.105(b) (1980).
In other words, 100 millirems, or 0.1 rem, is the maximum dose to which a licensee may expose an individual at its site boundary during any seven-day period without violating the law. By comparison, in order to satisfy the first part of the extraordinary nuclear occurrence threshold, some offsite individual must receive a whole body dose of 20 rems (without time limit). 10 C.F.R. § 140.84 (1980). The threshold is higher by a factor of 200 than the radiation limit for legal operation of the plant.
79 10 C.F.R. § 140.81(b)(3) (1980).
asserts that the Commission has the discretion to define extraordinary nuclear occurrence in a way that is responsive to the needs of the public, and that accidents of far smaller size (than TMI) could be designated extraordinary nuclear occurrences in conformity with the legislative intent of the Price-Anderson Act as amended. The Commission has not yet ruled on the petition. There is apparently some feeling among the NRC commissioners themselves that the threshold criteria should be reviewed, but that opinion does not seem to be shared by a majority.

In response to the NRC’s notice of its intention to undertake an extraordinary nuclear occurrence determination for the TMI accident, the Commission received considerable comment that the criteria were inadequate or unreasonable. The NRC Staff Panel’s defense of the criteria was not convincing, relying largely on the lack of complaints prior to the TMI accident. Significantly, the Commission inadvertently admitted that the criteria were based upon outdated radiation standards.

Administrative action to lower the criteria for the threshold is advisable in the absence of other reform. The NRC could lower the quantitative criteria for an extraordinary nuclear occurrence by administrative rulemaking. Such a change would reduce the potential mischief of the threshold to the extent that it only excluded minimal accidents from the waiver scheme. However, the statutory language requiring “substantial” radiation levels and damages would seem to constrain the Commission from

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81 Id. at 50,420.
82 See Metropolitan Edison Co., 11 N.R.C. 519, 522 & n.1 (1980) (“Indeed, we have some reservations about the criteria and the statutory definition of an ENO in light of the Three Mile Island experience”) (footnote that one commissioner believes that the criteria reflect “an outdated and overly relaxed view of the level of acceptable radiation dosages”).
83 STAFF ENO REPORT, supra note 54, app. C, at 11, 15-16.
84 The Staff Panel expressly declined to address the question whether the criteria should be changed, id. at 2, but responded to the attacks on the criteria by stating that they were established in 1967 and 1968 consistent with then — current standards contained in Federal Radiation Council protective action guides. The criteria were established in the course of public rule making whereby members of the public and other interested parties had the opportunity to comment. The adequacy or reasonableness of the criteria had never been questioned after enactment of the rules in part because there had never been, before TMI, an occasion to implement the criteria.
85 Id. at 15.
87 See notes 77-81 and accompanying text supra.
going far enough to accomplish the reform that is needed. More importantly, because other fundamental changes are appropriate to give substance to the public protection promise of the waiver of defenses provisions, a more drastic legislative remedy is called for.

B. Arguments for Abolition

The extraordinary nuclear occurrence threshold so defeats the rationale of the waiver provisions that Congress should abolish the threshold from the Price-Anderson Act. For one, the Three Mile Island incident calls into question a basic premise of the threshold, that claims arising from less serious accidents are less meritorious, and therefore less deserving of the protections provided by the waivers. There is no logical relationship between the severity of a nuclear incident and the merit of an individual claim resulting therefrom.\(^8\) If the claimant can demonstrate that he or she has suffered loss and that the loss was caused by the nuclear incident, recovery should not depend on how much radiation was released or how much total damage was caused.

Although the threshold does not deny victims of lesser accidents any rights they would otherwise have under tort law, it denies them rights accorded to victims of extraordinary nuclear occurrences on the basis of a classification (severity of the accident) not rationally related to the articulated congressional purpose of excluding unmeritorious claims.\(^9\) Although this irrational-
ality may not rise to the level of an equal protection violation, critics have questioned the fairness and rationality of such differentiation of treatment of claimants on policy grounds.90

Secondly, the threshold contravenes another congressional purpose of the waiver scheme — mitigating legal uncertainties.91 The uncertainties caused by varying defenses that licensees might have in different states are replaced under the threshold requirement by a more substantial uncertainty: whether those defenses will have to be waived under the Act. Until a determination is authoritatively made as to whether the accident was an extraordinary nuclear occurrence, claimants may not know whether they will have to prove negligence, how long they will have to file their claims, or in which court they should be filed. In the only experience to date, the NRC took more than a year to make that determination.92


The liability limit of the Act was attacked on equal protection as well as due process grounds in Carolina Environmental Study Group, Inc. v. United States Atomic Energy Comm., 431 F. Supp. 203 (W.D.N.C. 1977). The court held that the $560 million liability limit in the Price-Anderson Act was constitutionally defective in three respects: (1) the amount of the limit was not rationally related to potential losses from nuclear accidents; (2) the liability limit irrationally encouraged irresponsibility among nuclear plant builders and owners; and (3) the Act abolished state tort law remedies without providing potential nuclear victims with a quid pro quo. Id. at 222-24. The court also held that equal protection was lacking because the burden of nuclear damages exceeding $560 million was on people chosen without national relation to the Act's purposes. Id. at 224-25.

The Supreme Court, however, reversed unanimously. Duke Power Co. v. Carolina Environmental Study Group, Inc., 438 U.S. 59 (1978). The Court rejected each of the district court's three due process holdings, and suggested also that the Act did not deny equal protection. The Court held: (1) the liability limit is not irrational, since Congress, to promote the nuclear industry had to choose some figure for maximum liability and the Court deferred to Congress' judgment concerning the actual amount; (2) the limit does not encourage irresponsibility, since nuclear safety is supposed to be ensured by independent regulation; (3) the assurance of a $560 million fund is a reasonably just substitute, and therefore an adequate quid pro quo, for the common law rights abrogated by the Act. The Court assumed arguendo that a quid pro quo was necessary, but expressly refused to hold that it was. Id. at 86-89. Although the equal protection argument was not pursued on appeal, the Court said that any classification which establishes a liability limit was rationally related to the promotion of the nuclear industry. Id. at 93-94. See generally Dickerson, Limited Liability for Nuclear Accidents: Duke Power Co. v. Carolina Environmental Study Group, Inc., 8 ECOLOGY L.Q. 163, 167-68 (1979).

The constitutionality of the extraordinary nuclear occurrence threshold is beyond the scope of this article, which scrutinizes the concept on policy grounds. The irrationality which might make the threshold unconstitutional certainly makes it bad policy, apart from any decision by the Supreme Court on its constitutional status.

90 See note 88 supra.
91 H.R. REP. No. 2043, supra note 23, at 6-7.
92 See note 76 supra.
The Three Mile Island incident also demonstrates the potential inadequacy of the twenty-year gross statute of limitations provided by the waivers. If a statistically significant number of additional cancers were not to appear among the population exposed to radiation until more than twenty years after the accident, the claims of the victims might well be barred by the statute of limitations. The logic and fundamental fairness of the discovery rule apply equally to claimants on both sides of an arbitrary twenty-year line, and easily outweigh the interests of defendants in repose from "stale" claims.98

Moreover, the threshold is unnecessary. One of the central rationales originally offered for the threshold was the elimination of "nuisance suits."94 Critics of the threshold, however, have effectively debunked the need for the threshold as a screen against nuisance suits. As several witnesses pointed out at the hearings prior to passage of the 1966 amendments, the problems that victims of low-level radiation exposures would face in proving damages and causation — elements not affected by the statutory waivers — would provide more than adequate protection against frivolous claims.91

The contention that the causation hurdle would provide more than enough protection against frivolous claims was never adequately answered by supporters of the threshold concept.96 This

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98 See Birnbaum, supra note 30.
94 See supra note 46.
96 This point was forcefully made by Columbia University Law Professor Arthur W. Murphy, who testified:

If, as we are assured, the intent of the bill is to exclude only nuisance claims, I wonder whether the game is worth the candle.

[It is still not clear that juries or courts, if properly advised and intelligently briefed, will have any great difficulty in separating the spurious from the real claim solely on the basis of the existence of legal causation.

The danger of the present wording of the statute is, of course, that a number of meritorious claims will go down the drain with the nuisance claims despite the protestations of all concerned that that is not their intent.

Waiver Hearings, supra note 22, at 68-69.

Another participant stated:

The apparent justification for the "extraordinary" concept is the avoidance of "nuisance" suits. This justification gives little weight to the already formidable burden carried by claimants in proving causation. . . . [I]t is doubtful whether waivers of "fault" will really encourage fictitious claims in light of the "causation" hurdle. . . . [I]t is true that a shorter period of limitations may reduce the number of suits brought, but statutes of limitations do not discriminate between legitimate and "nuisance" claims.

Id. at 283 (statement of Richard D. Kahn).

96 Asked why the waivers should not apply to any nuclear incident, Walter A. Hamilton, vice president of United Nuclear Corp., answered: "You would certainly open the door to what are called nuisance suits. . . ." Id. at 57. When it was pointed out that the
failure is significant since the causation problems related to radiation injury in general, and especially low-level radiation, are peculiarly severe. It is impossible to prove that a particular case of cancer was caused by a particular exposure to radiation. The only way a causal connection between the exposure and the disease can be shown is by a statistical increase in the incidence of the disease among those who were known to be exposed. Such a showing will be very difficult where the radiation exposure is low.

Finally, the threshold determination itself may exert undue pressure on claimants and defendants in litigation. If the NRC officially determines that an accident is not an extraordinary nuclear occurrence, defendants obtain an undeserved psychological bargaining chip in settlement negotiations. The NRC finding could also influence a jury on the merits. Conversely, a positive determination would give the claimants an undeserved advantage in terms of the actual merits of their claims. Thus, the threshold's irrational connection between overall severity of the accident and the merit of individual claims can adversely effect the outcome of claims even where application of the waivers is not critical.

C. Future Directions

For the reasons above, Congress should abolish the concept of the extraordinary nuclear occurrence from the Price-Anderson Act. At the same time, some standard for the application of the waiver provisions is required. The following recommendations point out the possible contours of reform.

1. Create a “nuclear incident” standard— One likely reform would be to institute a standard which would apply the waivers of defenses to all “nuclear incidents.” The effect would be to replace the current, unreasonably high threshold with a minimal, flexible one, determined judicially rather than administratively.

claimant would have to prove causation, he responded: “I think you change the temper of the situation if you extend it too broadly. It has a very valuable meaning if you restrict it to special situations.” Id. at 58. Unfortunately, the Committee members did not press Mr. Hamilton to elaborate, and that cryptic comment was the best response that was offered to this incisive criticism of the need for the threshold. The same conclusion was reached in Note, supra note 12, at 381.


tively. This judicially determined definition of nuclear incident should include loss of use of property, and expenses and income loss arising from objectively reasonable actions taken to avoid exposure to radioactivity. This would guarantee that the waivers would apply to any accident involving reasonable evacuations, a finding within the competence of the courts.

2. Replace the twenty-year statute of limitations with a discovery rule—More adequate protection of the public calls for at least one amendment to the waiver provisions themselves. The twenty-year gross statute of limitations should be repealed, so that the “three years from time of discovery of injury” rule remains applicable indefinitely. Because many radiation injuries can have latency periods longer than twenty years, and genetic defects can take several generations to appear, the present provision is no help to the victims of those injuries.

3. Create additional waivers—If Congress wishes to demonstrate genuine concern for protection of the public from nuclear technology, it should consider the addition of more substantive waivers to the present ones. For example, if licensees were required to waive any issues or defenses as to the compensability of certain damages not always allowed under tort law, the scheme would more equitably allocate the true social costs of nuclear accidents. Examples of these damages include evacuation expenses, lost income, lost business revenue, decline in property values, health monitoring costs, severe psychological distress, loss of peaceful use and enjoyment of property, and other consequential and incidental injuries. State tort laws have widely disparate standards for compensability of such damages. The Act would be greatly improved if it mitigated the disparate effects by ensuring the compensability of those damages as long as the claimants can prove actual harm and causation. The difficulties of proof will be more than adequate to dispose of unmeritorious claims.

CONCLUSION

The concept of waiver of defenses is a step toward improving the public protection component of the Price-Anderson Act, but the extraordinary nuclear occurrence threshold tends to make the promise of protection largely illusory for an important class of accident victims. To the extent that future accidents cause substantial economic dislocation without heavy physical damage, the threshold creates a substantial gap in protection of the pub-
lic. The threshold should be abolished because it is superfluous as a screen against frivolous claims, excessively broad in its application, and a source of needless uncertainty and complexity in administration. Additionally, Congress should repeal the twenty-year limit on waiver of statute of limitation defenses, so that victims of nuclear incidents are not unfairly precluded from receiving compensation for their injuries.

—Dean R. Tousley