
David M. Rocchio
THE PRICE-ANDERSON ACT: ALLOCATION OF THE EXTRAORDINARY RISK OF NUCLEAR GENERATED ELECTRICITY: A MODEL PUNITIVE DAMAGE PROVISION

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[It is not the easiest thing for a group of laypersons, such as we on this committee, to try to deal intelligently and with some consequence with the range of issues such as are presented by nuclear power. We are none of us scientists. We have at most a very lightly sketched understanding of the issues we are dealing with. Yet it is a condition that is presented to us; a condition not different from that which persons in the modern world frequently find themselves . . . .

On the other hand, we aren't without some experience in the world and we try to cope . . . . What we are trying to deal with right now is the fact that the nuclear industry could be doomed in this country.]

Senator Daniel Patrick Moynihan

I. INTRODUCTION

As the United States enters its fourth decade with nuclear power, the potential damages from an accident remain high. Nuclear power

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* Solicitations Editor, 1987-1988, BOSTON COLLEGE ENVIRONMENTAL AFFAIRS LAW REVIEW.


3 See infra note 83 and accompanying text.
is a dangerous source of electrical generating capacity. This danger is evidenced by the operating record of the nation's nuclear power facilities. In 1986, for instance, the Federal Department of Energy shut down two plutonium-producing plants at the Hanford Nuclear Reservation in Richland, Washington because workers were not observing safety standards at the facility. The Nuclear Regulatory Commission (NRC) has found bad management by utility companies to be the main cause of design and construction flaws in nuclear plants. Moreover, the NRC's reticence in not requiring an Ohio nuclear facility to replace defective water pumps until nearly six years after the Three Mile Island accident resulted in a similar chain of events at the plant outside Toledo that had caused a near meltdown of the reactor core at Three Mile Island. These incidents show that, even after the Three Mile Island reactor accident in 1979, not enough is being done by the federal government or the nuclear industry to guarantee safe operation of nuclear power plants.

Congress, through the Atomic Energy Act of 1954, adopted the policy of private development of nuclear energy for commercial use. Commercial generation of nuclear power, however, is hindered by the cost of protecting against the extreme danger posed by a nuclear accident. In order to encourage private commercial generation while also protecting the public against the dangers inherent in such generation, Congress has created a complex statutory framework.

One major problem with the private development of nuclear power is the uninsurability of nuclear reactors against the catastrophic risk involved in producing nuclear generated electricity. Neither risk nor potential liability arising from a nuclear accident are fully cal-

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4 For a discussion of fuel-cycle risk, see infra note 54. For a discussion of risk assumed by persons outside of the fuel-cycle, see infra note 55.
6 N.Y. Times, Apr. 9, 1984, at B12, col. 1.
9 See infra notes 40–124 and accompanying text.
11 This Comment uses "nuclear accident," "nuclear disaster," and other similar descriptive terms to mean an event that causes damage to any person or property, either on- or off-site at a nuclear facility, due to contamination by nuclear materials or a nuclear reaction at that site. "Nuclear incident" is used as defined by the Atomic Energy Act of 1954:
q. The term "nuclear incident" means any occurrence, including an extraordinary nuclear occurrence, within the United States causing, within or outside the United States, bodily injury, sickness, disease, or death, or loss of or damage to property,
culable. Damage estimates based upon a severe nuclear accident near a population center range from $14 billion in property damage and 3,500 early fatalities to $300 billion in property damage and 100,000 early deaths. Wind, rain, and cloud patterns at the time of an accident may cause a tenfold increase in damages. In 1957, Congress passed the Price-Anderson Act in an attempt to guarantee that the fledgling private nuclear power industry could develop nuclear power without assuming the high risk involved.

Through the Price-Anderson Act (the Act), the federal government indemnifies licensees of the NRC. The Act also places a

arising out of or resulting from the radioactive, toxic, explosive, or other hazardous properties of source, special nuclear, or by-product material . . . .


"Extraordinary nuclear occurrence" is used as defined in the Atomic Energy Act of 1954: j. The term "extraordinary nuclear occurrence" means any event causing a discharge or dispersal of source, special nuclear, or by-product material from its intended place of confinement in amounts offsite, or causing radiation levels offsite, which the [Nuclear Regulatory] Commission determines to be substantial, and which the Commission determines has resulted or will probably result in substantial damages to persons offsite or property offsite. Any determination by the Commission that such an event has, or has not, occurred shall be final and conclusive, and no other official or any court shall have power or jurisdiction to review any such determination. The Commission shall establish criteria in writing setting forth the basis upon which such determination shall be made . . . .


14 Meyer, supra note 12, at 446.


16 The [Nuclear Regulatory] Commission shall with respect to licenses issued, . . . for which it requires financial protection of less than $560,000,000, agree to indemnify and hold harmless the licensee and other persons indemnified, . . . from public liability arising from nuclear incidents which is in excess of the level of financial protection required . . . .
liability cap on damages from each nuclear accident involving the release of fissionable material into the atmosphere. The cap is either the total amount of the licensee's financial protection or $560 million, whichever is greater. The Act is intended to both protect the public from loss arising through nuclear accidents and to encourage private investment in nuclear power. As passed in 1956, the Act was to protect the private nuclear industry for ten years, after which the industry was to provide for its own liability insurance. Rather than having industry assume risks after ten years, however, Congress has instead reauthorized the Act.

The most significant amendments to the Act occurred in the years of the Act's reauthorization, 1966 and 1975. The provisions of the 1966 and 1975 reauthorizations of the Act reflect mood changes in

42 U.S.C. § 2210(c) (1982). For a description of NRC licensees, see U.S. Nuclear Regulatory Commission, Licensed Operating Reactors, Status Summary Report, Data as of 05/31/86, NUREG-0020 (1986) [hereinafter Status Summary Report] and infra note 49. Nuclear power plants are operating and nuclear fuel or nuclear waste is being transported in nearly every state. As one source indicates:

Nuclear power plants are sited in 34 states. Shipments of nuclear materials travel through hundreds of communities regularly . . . . The cities of New York, Chicago, Boston, Washington D.C., Philadelphia and Detroit are closer to nuclear plants than the city of Kiev is to Chernobyl. Many other plants are sited near America's most fertile agricultural areas. An accident at one of these sites could cause tens of billions of dollars in damage to health, property and businesses.


The aggregate liability for a single nuclear incident of persons indemnified, . . . 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, the sum of $560,000,000, or the amount of financial protection required of the licensee, whichever amount is greater . . . .


In order to protect the public and to encourage the development of the atomic energy industry, in the interest of the general welfare and of the common defense and security, the United States may make funds available for a portion of the damages suffered by the public from nuclear incidents, and may limit the liability of those persons liable for such losses.


"[D]uring the 10-year period it is hoped that there will be enough experience gained so that the problems of reactor safety will be to a great extent solved and the insurance people will have had experience on which to base a sound program of their own . . . ." S. REP. No. 296, 85th Cong., 1st Sess. 9 (1957).


society and Congress. While Congress clung to the hope that it had placed in nuclear power, each amendment to Price-Anderson presented greater attempts at public protection than did its predecessor. The aggregate effect of the two principal amendments was to increase the level of private insurance for some reactors, to institute waivers of some defenses to suits arising from a nuclear accident, and, through increased industry contribution to insurance pools, theoretically to end indemnification of the private industry for the difference between the level of financial protection and the liability cap. Unless reauthorized, the Price-Anderson provisions of the Atomic Energy Act of 1954 expired on August 1, 1987.

Congress undoubtedly will pass legislation to reauthorize the Act, which has become a controversial element of the Atomic Energy Act. Yet the stated purpose of protecting the public and also limiting the liability of utilities for damages following an accident presents a paradox. The liability cap and indemnification provisions, which are the heart of the Act, do nothing to encourage safety in nuclear plant operations. In fact, by limiting the liability

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23 See Buffington supra note 10, at 684–685. See also 42 U.S.C. § 2210(n) (1982):

[T]he Commission may require provisions . . . which waive (i) any issue or defense as to conduct of the claimant . . . (ii) any issue or defense as to . . . immunity . . . (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, . . . but in no event more than twenty years.

42 U.S.C. § 2210(n) (1982). See also infra note 73 and accompanying text.
24 See Buffington supra note 10, at 685. 42 U.S.C. § 2210(b). This is, however, a semantic change due to Congress' proviso in 42 U.S.C. § 2210(e): "Provided, That in the event of a nuclear incident . . . 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 . . . ." 42 U.S.C. § 2210(e) (1982). The likelihood that Congress will react to a nuclear disaster and appropriate large sums from general revenues must be considered. For the language proposed by the 99th Congress' House Committee on Interior and Insular Affairs, see infra note 234.
30 It is beyond the scope of this Comment to criticize, catalog or discuss Congress' full role
of plant manufacturers, builders, and operators, little incentive exists to place a high priority upon safety and quality control by those producing nuclear generated electricity.

The legal issues raised by the industry's uninsurability absent the intervention of a federal statute remain complex and controversial. An inability to provide adequate insurance coverage for damages which may arise from a nuclear accident impacts legitimate damage claims which may result from a nuclear accident. By limiting the monies utilities are required to pay out following an accident, little incentive exists to encourage utilities to carefully manage the nuclear plants. This Comment focuses on whether Congress should allow claims for punitive damages under state tort law within the framework of the Price-Anderson Act. The issue of punitive damages in encouraging the development of commercially generated nuclear electricity. This Comment analyses the provisions of the Price-Anderson Act and how they relate to the issue of legitimate punitive damage awards. Similarly, this Comment does not purport to discuss the merits of the Price-Anderson Act, although it does question the logic of the Act. The Act must, at the very least, be amended, if not repealed and replaced with a different means of regulating and supplying nuclear generated electricity.

The history of nuclear power in the United States is well documented in D. FORD, THE CULT OF THE ATOM: THE SECRET PAPERS OF THE ATOMIC ENERGY COMMISSION (1982) [hereinafter D. FORD]. Nuclear energy was first released as a result of the United States' war effort in World War II (WWII). The "Manhattan Project" was the top-secret atomic power research and development branch of the Roosevelt Administration. The sole goal of the project was to develop a weapon for use in WWII. The cities of Hiroshima and Nagasaki, Japan were bombed with crude atomic weapons in 1946. See D. FORD, at 25–31. See also Buffington, supra note 10, at 686, 688; Note, Federal Supremacy, supra note 27. For a discussion of the likely results of a major nuclear accident, see infra notes 12–14, 53–59, 82–91 and accompanying text.

31 Two United States Supreme Court cases have dealt directly with the Price-Anderson Act. In Duke Power Co. v. Carolina Envtl. Study Group, Inc., 438 U.S. 59 (1978), the Supreme Court held that Price-Anderson did not violate the U.S. Constitution on either due process or equal protection grounds. In Silkwood v. Kerr-McGee Corp., 464 U.S. 238 (1984), the Court held that the Atomic Energy Act did not preempt a punitive damage award based in state tort law. Silkwood has strongly worded dissents. Justice Blackmun's dissent in Silkwood defended federal supremacy in the nuclear arena. Justice Blackmun argued that the majority misconstrued the federal regulatory structure and the Court's prior Atomic Energy Act cases: "The Court, in my view, tortures its earlier decisions and, more importantly, wreaks havoc with the regulatory structure that Congress carefully created." 464 U.S. at 259. Justice Blackmun also attacked the Court's reasoning and logic: "Having focused on the wrong issue, the Court seeks to support its wrong result by focusing on the legislative history of the wrong statute." 464 U.S. at 269. For a discussion of the Supreme Court's analysis, see infra notes 126–88 and accompanying text.

32 According to the Supreme Court in Silkwood, [playing both federal fines and state-imposed punitive damages for the same incident would not appear to be physically impossible. Nor does exposure to punitive damages frustrate any purpose of the federal remedial scheme . . . .
touches upon the goals of the Atomic Energy Act, the functioning of the Price-Anderson liability limitation provisions, and ultimately upon the appropriate means to regulate nuclear power. This Comment concludes that a well-drafted provision allowing punitive damages under state law would strengthen the protection afforded the public through the Price-Anderson Act. 33

It is first necessary to review the theory behind and the operation of the Price-Anderson Act. Included in this discussion is an examination of the scientific estimates and models used to establish risk involved with commercial nuclear power plants. 34 In addition, reference will then be made to the record that comprises the legislative history of the Act. 35 The second section presents an analysis of the Supreme Court's decisions that interpret the Price-Anderson Act, an analysis of the Atomic Energy Act, and a discussion of the 99th Congress' work on the Price-Anderson Act. 36 Finally, given the conclusion that punitive damages based on state tort law should be allowed, 37 a model punitive damage provision for the Act is proposed. 38 This punitive damage provision would specifically allow state tort law to impose punitive damages on nuclear facilities in certain circumstances. 39

II. DEVELOPMENT AND OPERATION OF THE PRICE-ANDERSON ACT: THE THEORY OF PROTECTION AND THE LEGISLATIVE RESPONSE

A. Shielding Risk, Externalizing Cost

Regulation of risk is usually done after the initial political and financial decision to proceed with the development of new technol-
The narrow analytical process used in initial decision making forces segments of society that do not directly benefit from the technology to carry the real costs. The development of nuclear disaster regulation is a clear example of this post hoc decision making process. The Atomic Energy Act of 1954 established private development of nuclear power based upon the limited knowledge of members of Congress and industry. Not until three years after the Atomic Energy Act's passage did industry and government first analyze the extraordinary liability risk of nuclear energy. This analysis showed that the risk of a nuclear accident, while small, could not be discounted. Moreover, the damages from such an accident would be high.

This failure to take into account external costs often results in technological advances and progress for society. This failure may, however, also result in unmitigated disaster. Ninety-three nuclear

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40 The societal decision to build a particular facility ideally would be based upon the balance between all the benefits and costs of the proposed facility. Considerations would include the costs of the facility itself and the costs of choosing one of the alternatives, as well as the costs of building no facility at all. Risk costs would be included in the decision process, and general risk management criteria would be applied to all technologies. However, in the United States decisions are not usually based upon such broad considerations. Regulation of risk is not often done separately from the political and/or financial decision to go ahead with a particular project, and becomes a matter of reducing and managing the adverse impacts associated with the endeavor.


41 Id.


43 The findings of this analysis did not, unfortunately, trigger a rethinking of the decision to privatize the industry. Instead the privatization was allowed to go forward behind the shield of the Price-Anderson Act.

44 See infra note 55.

45 Id.

46 External costs are defined as costs not borne directly by the developer but those that are spread among a larger group. In the case of nuclear energy the larger group may be the stockholders, ratepayers, society as a whole, or the victims of a nuclear accident. Meyer, supra note 12, at 441.

47 To a large extent, the major transportation networks in the United States were paid for by all of society. In the case of the railroads, the private carriers were allowed to operate at a profit based on artificially low costs due to the federal government's involvement in establishing right of way and financing the construction. Environmental damage caused by the construction of the railroads is incalculable and was not a part of the equation used to determine whether the railroads were worth the cost. Similarly, the interstate highway system, while a federal project, was built for profit by private contractors. Again, the worth of the project was to a large extent determined without considering the environmental ramifications. In both cases the benefits have been so great that few in society question the original decisions to proceed.

48 See infra notes 47-49, and accompanying text.
reactors were in commercial operation in the United States as of January 1987.49 These ninety-three reactors produced 77,703 megawatts (MWe)(Net) of electricity.50 Three additional licensed reactors are in “power ascension,” or permanently turned off due to accident, failure, or age.51 Four reactors are licensed for fuel loading and low power testing.52 The number of reactors and the variety of their designs make it imperative that utilities bear some of the responsibility for reducing risk in the operation of nuclear plants. The NRC cannot adequately insure high standards of professionalism and care in the operation of nuclear generating reactors.

The NRC recognizes that preventing nuclear accidents is nearly impossible, if for no other reason than the fact that many factors are beyond a plant operator’s control. According to the Advisory Committee on Reactor Safety of the NRC, “the difficulty in demonstrating with a very high degree of confidence that . . . [a] large scale fuel melt [will not occur,] in view of the complexities introduced by consideration of matters such as sabotage, earthquakes, and other potential multiple failure scenarios” makes accident prevention impossible.53 The production of huge amounts of electricity through a very clean technology when all is well54 is thus juxtaposed against the massive, albeit unlikely, consequences of one failure.55

49 Status Summary Report, supra note 16.
50 For a basis of comparison, New England’s peak one hour demand for electricity as of March 1987 occurred on January 26, 1987, when 17,500 megawatts (MWe) of generated electricity needed to be delivered at once. New England’s generating capacity as of December 31, 1986 was 23,250 MWe of electricity. The Breton Point Coal Plant generates about 630 MWe of electricity, and is comparable in physical size to Seabrook. Seabrook, if allowed to go on line, would produce about 1,150 MWe of electricity. Telephone interview with William P. Sheperdson, Communications Administrator, New England Power Pool (February 20, 1987).
51 These reactors are “plants licensed for operation which are shut down indefinitely.” Status Summary Report, supra note 16. They are the Dresden I Reactor, the world’s largest plant when built, Humboldt Bay, and Three Mile Island II. Id.
52 Id.
53 Quantative Safety Report, supra note 41, at 58.
54 “[T]he total fuel cycle risk to the general public and plant workers was given as .59 to 1.7 fatalities per plant year for the nuclear fuel cycle and 15 to 120 fatalities per plant year for the coal fuel cycle.” S. REP. No. 310, 99th Cong., 2d Sess. 31 (1986) (statement of James W. Vaughan, Jr., Acting Assistant Secretary for Nuclear Energy, Department of Energy).
55 The probability of an accident resulting in total damages (meaning both personal loss and property damage) on the order of $60 billion (meaning that total damages would be above $6 billion and below $600 billion) is about 1/1,000,000,000 per reactor year. The odds equate to
Lower insurance costs made possible by the Act have shifted real costs away from producers to the public. This effect has been termed an externalization. The true costs of nuclear accidents are therefore not reflected in the price of nuclear energy. As a result, the public does not consume nuclear energy at the same rate that it would if the price directly reflected the full cost of insuring against accidents. Arguably, therefore, utilities in the United States overproduce and energy users overconsume nuclear generated electricity. The imposition of catastrophic loss risk on society, not industry, means that the public pays less for expensive energy now, yet will pay the cost of any eventual nuclear accidents. Congress' attempt to control the cost-benefit analysis of commercially generated nuclear electricity, in part through the Price-Anderson Act, has resulted in a paradox.

Harold Green has noted the paradox of Price-Anderson's dual goals:

In the past, congressional consideration of the Price-Anderson Act and its amendments has proceeded on the tacit assumption that Price-Anderson is a technical measure necessary for adequate protection of the public interest with respect to a technology that exists and will inevitably grow substantially. The fact that the technology exists and grows only because of Price-Anderson has been artfully concealed from public view so that consideration of the indemnity legislation would not trigger pub-

about a 1/333,333 chance for 100 reactors over thirty years. Meyer, supra note 12, at 446; See also Strip Report, supra note 13, at 4-11.

"[A] cost of production is neither borne by the producer nor passed on to the consumer through price increases but rather is transferred to the public at large or to some sub-class of the public." Meyer, supra note 12, at 441.

This is a failure of the market mechanism to the extent that a production cost can be shifted from the producer to the public at large, the cost is not reflected in the product's price. See id. at 442.

Two subsidies exist within the framework of Price-Anderson. The first is an artificial limitation on liability. With a limitation, the taxpayer or the accident victim, depending on whether Congress acts to pay damages or allows victims to take a pro-rata share, not the responsible party, pays the damages exceeding that limit. The second subsidy allows the nuclear industry to avoid the full cost of insuring against nuclear disaster. K. Kehoe, UN-AVAILABLE AT ANY PRICE, ENVIRONMENTAL POLICY CENTER (1980) (citing Green, Nuclear Power: Risk, Liability and Indemnity, 71 Mich. L. Rev. 479, 501 (1983)). The average annual premium for insurance to cover losses to the nuclear plant itself is, on average, more than 12 times the annual premium utilities pay for liability insurance to cover damages to the public. U.S. Nuclear Regulatory Commission, Report to Congress, The Price Anderson Act: The Third Decade, NUREG-0957 (1983).

Meyer, supra note 12, at 443.

"[I]f the costs of these catastrophic loss risks were placed upon the facility generating the risks, the industry in question might not exist." Meyer, supra note 12, at 453.
lic debate as to whether nuclear power was needed and whether its risks were acceptable. Exposing the nuclear industry to liability for its actions, including liability for punitive damages, would give the public an opportunity to evaluate the actual cost of nuclear power as reflected in its utility bills. As it stands now, that cost is hidden in an obscure federal statute of limited protections. The legislative history of the Atomic Energy Act and the Price-Anderson Act make it clear that Congress intended the catastrophic loss risk to fall on the public only for the short term. This risk remains with the public today, over thirty years after the statutory enactments.

B. Legislative History

In 1946 the United States government owned the most powerful force known to man. The atom bomb had ended the Second World War and was, according to the President and the Congress, going to remake the world in peacetime, in part by generating inexpensive electricity through controlled nuclear reactions. As the Supreme Court stated in Pacific Gas & Electric Co. v. State Energy Resources Conservation & Development Commission: "[t]he turning of swords into plowshares has symbolized the transformation of atomic power into a source of energy in American society."

This vision of nuclear power as a source of energy was first given form in the Atomic Energy Act of 1946. The Atomic Energy Act of 1946 created the Atomic Energy Commission (AEC) and gave the AEC control over the government's monopoly of atomic power. The 1946 Act also created the Joint Committee on Atomic Energy
(Joint Committee), which was composed of nine members from each house of Congress. By the late 1940's, the AEC and other expert opinion convinced the Joint Committee that, contrary to the original plans for a governmental monopoly, private development of nuclear power would best serve the country. Once the Joint Committee determined to pursue private development of nuclear power, the Committee was soon able to work with President Eisenhower at rewriting the Atomic Energy Act of 1946.

President Eisenhower sent a reworked Atomic Energy Act to Congress shortly after his "Atoms for Peace" speech in 1953. The 1953 bill called for private development of nuclear power and was endorsed by the Joint Committee. The Committee members' optimism for private development of nuclear energy included optimism in safety developments. This sentiment is reflected in the Committee's 1954 statement that "[i]t is now evident that greater private participation in power development need not bring with it attendant hazards to the health and safety to the American people." The Joint Committee's 1954 report went on to document the great strides made in developing nuclear power and proclaimed that "the goal of atomic power at competitive prices will be reached more quickly if private enterprise . . . is now encouraged to [help develop nuclear power]

Neither the bill nor the Committee report discussed the issue of public liability. The strongest dissent to the Committee's action in creating the Atomic Energy Act was a vehement attack on the federal government's control of patents developed by the law. This

68 Id. § 15.
73 Id. at 3459. The report continued, "[i]n particular, we do not believe that any developmental program carried out solely under governmental auspices, no matter how efficient it may be, can substitute for the cost-cutting and other incentives of free and competitive enterprise." Id.
75 S. REP. No. 1699 supra note 72, at 3487–3488.
shows that the Committee’s focus was not on safety. Not until the
bill had become law and the private development of the nuclear
industry was well under way did the Joint Committee consider the
dilemma of insuring against huge damage awards.\textsuperscript{76}

Private industry’s enthusiasm for nuclear power waned quickly as
information about risk was developed.\textsuperscript{77} As one commentator stated,
“merely breaking even, let alone making a profit, lay in the relatively
remote and uncertain future . . . . [Another] obstacle was the prob-
lem of potential public liability . . . .”\textsuperscript{78} In 1956, the Joint Committee
held hearings to determine what catalyst could be used to get the
Atomic Energy industry off the ground.\textsuperscript{79}

Protection was needed against the damages caused by the release
of “fission products”\textsuperscript{80} into the atmosphere. A release would occur
following damage to a reactor core, caused by accident, mechanical
failure, sabotage, operator error, war, or natural disaster.\textsuperscript{81} Fission
material is the most toxic substance known to man.\textsuperscript{82} Four major
classes of public health effects are associated with nuclear accidents:
early fatalities, early injuries, latent cancer fatalities, and genetic
defects.\textsuperscript{83} The potential for such serious and far-reaching injuries

\textsuperscript{76} As the Supreme Court put it, “[i]t soon became apparent that profits from the private
exploitation of atomic energy were uncertain and the accompanying risks substantial.” \textit{Duke
Power}, 438 U.S. at 63 (citing Green, \textit{supra} note 57).

\textsuperscript{77} The data began being reported in 1957 and continues to be collected through this day.
See \textit{AEC, Theoretical Possibilities and Consequences of Major Accidents in Large Nuclear
Power Plants, WASH–740} (1957); \textit{AEC, Papers on Update of WASH–740} (1964) (unpublished
papers on file in NRC Public Document Room, Washington, D.C.); \textit{AEC, An Assessment of
Accident Risks in U.S. Commercial Nuclear Power Reactors: A Review of WASH - 1400}
(1975); \textit{Union of Concerned Scientists, The Risks of Nuclear Power Reactors: A

\textsuperscript{78} Green \textit{supra} note 76, at 480–81.

\textsuperscript{79} \textit{Hearings Before the Joint Committee on Atomic Energy on Government Indemnity
for Private Licensees and AEC Contractors Against Reactor Hazards, 84th Cong., 2d Sess. 47
(1956)} [hereinafter 1956 \textit{Indemnity from Hazards Hearings}].

\textsuperscript{80} Fission products are defined as certain heavy elements (such as uranium and plutonium)
that are split into approximately equal parts, resulting in the release of enormous quantities
of energy. Fissionable products are highly radioactive. For a brief description of radioactivity’s
toxic effect, see \textit{infra} note 83 and accompanying text.

\textsuperscript{81} Strip Report, \textit{supra} note 13, at 2–3.

\textsuperscript{82} See generally Green \textit{supra} note 57, at 481–84 (citing 1956 \textit{Indemnity from Hazards
Hearings}). See also 1956 \textit{Indemnity from Hazards Hearings} (testimony of C. Rogers McCullough)
\textit{supra} note 79; Strip Report, \textit{supra} note 13, at 3–4.

\textsuperscript{83} \textit{Id.} The Strip Report’s analysis of the health consequences of a nuclear accident demons-
trates why complex damages would arise following the release of fission products into the
environment. Based on a projection model, the report describes devastating consequences:
These are: early fatalities, early injuries and latent cancer fatalities. In addition [the
system] . . . also calculates thyroid and genetic effects, which will not be discussed
in this report. Early fatalities are estimated on the basis of exposure to the bone
translates into an enormous potential liability. Due to this potential for tremendous liability, the small likelihood of an accident does not mitigate the private sector's inability to insure against the consequences of an accident. The remoteness of the risk does not justify ignoring the damages that could result from a disaster.

marrow, lung, and gastrointestinal tract, and are observed within one year of exposure. Bone marrow damage is the major contributor. The risk of early fatalities for a given dose is determined by a dose-response curve (at which 50% of the exposed population is expected to die within 60 days). All persons exposed to greater than 615 rads are assumed to have a 100% mortality rate.

Persons receiving large doses who do not die are subject to early injuries, which are defined as nonfatal radiation induced illnesses requiring medical attention or hospitalization, and include prodomal vomiting, skin illness, and immunological system impairment. The final health effect we are concerned with is latent cancer fatalities. Latent cancers are assumed to have a ten-year latency period followed by a period at risk for the remainder of the individual's life (except leukemia which has a 30 year plateau). Strip Report, supra note 13, at 3.

On April 26, 1986, an accident occurred at the Chernobyl Nuclear Power Station, in the Soviet Ukraine. The accident constituted the world's first actual nuclear power catastrophe, with substantial loss of life, widespread exposure to radiation, and serious damage to the environment. The radioactive release was several million times greater than the release at Three Mile Island. Dukakis, Statement and Press Release based upon information gathered by Dr. Albert Carnesale of Harvard University's Kennedy School of Government (September 20, 1986) (available from the author). The lessons from Chernobyl are applicable to the U.S. nuclear industry in only limited ways due to the differences in reactor types. Two lessons from Chernobyl relate to damages following a nuclear accident. The accident could have been far worse than it was. Still, the event sheds light on the likely results of a major release of fissionable materials into the environment. As Governor Dukakis' Press Release commented: First, the geographical and weather conditions at Chernobyl reduced the threat to life by dispersing the release over a remarkably large area, extending in diffuse form to places remote from the plant, rather than depositing lethal concentrations in population areas close to the plant. The flatness of the Ukrainian plains where Chernobyl is located, and the hot, dry climatic conditions prevalent in that area tended to keep the radioactive debris aloft for relatively long periods of time. Despite the quality of the response, it was only because of the additional natural or fortuitous circumstances such as weather, geography, and altitude of the plume that more extensive immediate and long term injury was avoided. Chernobyl was in many ways a "best case scenario" for emergency response.

Even under these conditions, thousands of residents within five miles of the plant suffered radioactive dosages at least eight times greater than the threshold set forth in federal [NRC] guidelines for immediate evacuation and 200 times greater than normal annual background exposure. Also, the mitigating circumstances that accompanied the accident and its immediate aftermath did not spare the countryside around Chernobyl from distressing long-term effects. Evidence suggests that areas comprising hundreds of square miles may remain uninhabitable for four years. The impact of such depopulation on public health and safety, not to mention the area's economy and its basic community fabric, are beyond calculation.

Id. at 7–11.

84 The small likelihood of reactor failure is defined supra note 55.
85 Meyer, supra note 12, at 442.
86 Id. at 442–47; See generally H. Green, The Strange Case of Nuclear Power (1957).
Exposure to liability for a nuclear accident could thus potentially bankrupt the entire nuclear power industry.

Through the 1956 hearings, the Joint Committee tried to solve the problem of allocating liability for nuclear accidents while simultaneously maintaining a viable private nuclear power industry. The hearings involved coming to terms with private industry's need to know that, following a nuclear accident, a ceiling for potential damage liability existed. The nuclear power industry regarded the liability problem as a "roadblock" to the development of nuclear electricity.87 Testifying at the 1956 hearings, Willis Gale, Chairman of Commonwealth Edison Company, said: "[w]e have hoped that we could be assured that the risk was too remote to be considered. But we have not found a single expert who is willing to say that, within a period of years of actual experience, the hazard . . . can be ignored."88

The primary purpose of the Act, as seen by the AEC, was not "from the standpoint of disaster insurance to protect the public . . . [The AEC is] trying to remove a roadblock that has been said to interfere with getting people into this program . . . ."89 Congress dealt with the roadblock not by rethinking privatization of nuclear power, but by limiting the industry's liability following nuclear accidents.

The Joint Committee faced a difficult task securing passage of the Act. If, as the AEC argued, the AEC's regulations and oversight were enough to guarantee the safety of the public, then the need for a liability cap and indemnification program became hard to justify.90 The dilemma was that the legislation sought could be justified only upon a showing that nuclear power involved extraordinary risk. To demonstrate this risk would have frightened the public and, potentially, the Congress.91

The Joint Committee could not secure passage of the Act in 1956.92 In 1957, the Committee held new hearings93 at which the industry threatened to withdraw from the nuclear power program if Congress

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87 Green, supra note 76, at 484.
88 1956 Indemnity from Hazard Hearings, supra note 79, at 240.
89 1956 Indemnity for Hazard Hearings, supra note 46, at 36 (testimony of Harold L. Price, Director, AEC, Division of Civilian Applications).
90 Green, supra note 76, at 485.
91 Id.
93 Hearings Before the Joint Committee on Atomic Energy on Governmental Indemnity and Reactor Safety, 85th Cong., 1st Sess. 4 (1957) [hereinafter 1957 Indemnity Hearings]; see also Green, supra note 76, at 486.
did not adopt a liability cap and indemnification system.94 In the 85th Congress, the Price-Anderson Act was again reported out by the Joint Committee.95 This time the bill passed on a voice vote after limited debate in the House with one member opposing passage, and by voice vote with no debate in the Senate.96

The legislative history shows a congressional willingness to protect the nuclear industry and a strongly voiced hope in nuclear energy.97

94 "At this time we do not see any sound basis on which we can risk our solvency on the possibility, remote as it may be, of a major nuclear catastrophe." See supra note 79, 1956 Indemnity from Hazard Hearings, at 240 (statement of Willis Gale, Chairman, Commonwealth Edison Company).

95 See S. REP. No. 296 reprinted in, 1957 U.S. CODE CONG. & ADMIN. NEWS 1803. For Congressional statements on the 1957 passage of the Price-Anderson Act, see 103 CONG. REC. 15,057 (1957) ("Everybody who desired to appear was given an opportunity to testify or to file a statement. No statement has yet been submitted to the Joint Committee opposing this legislation except on behalf of one association." Statement of Senator Anderson discussing the history of the Joint Committee hearings held on the Price-Anderson Act concluding that the bill had nearly unanimous support). Id.

96 House debate is recorded at 103 CONG. REC. 10,710–10,725 (1957). The one member of the Joint Committee on Atomic Energy who dissented from the majority was Congressman Holifield of California. In a colloquy with Congressman Rogers of Colorado, Mr. Holifield responded to a defense of the liability cap by arguing that Price-Anderson would do nothing to protect the public.

You were told a few minutes ago that [Price-Anderson] was not to protect the reactor owners. It was to protect the people. I tell you that this relieves the reactor owners of their liability . . . . There is only one thing that can protect you, and that is a safe reactor, or a reactor in an isolated position where it will not explode in the neighborhood of the people who are liable to get killed.

103 CONG. REC. 10,715. The Price-Anderson Act was adopted in the Senate on voice vote with no debate. 103 CONG. REC. 15,057 (1957).

House passage is recorded at 103 CONG. REC. 15,182–15,183 (1957).

97 Representative Carl Durham, of North Carolina, then Chairman of the Joint Committee, was interviewed by Mr. Dave Garroway and Mr. Frank Blain on The Today Show in 1957. Chairman Durham shared an optimism with the journalists for the future of nuclear power, and, while a number of questions dealt with keeping the United States ahead of other nations that had atomic reactors, no questions about safety were asked.

On the television screen, Dave Garroway was seen in closeup seated at his regular desk . . . . From time to time during the interview, the Congressman was seen on full screen closeup . . . .

Mr. Garroway: . . . . In 1954, Congress decided that the peacetime use of nuclear power should be developed by a partnership of Government and private industry. Now what does that mean?

Congressman Durham: . . . . [T]o primarily assist private industry to get into the business of developing the atomic energy field for humanity, and for the benefit of the whole country.

. . .

Mr. Garroway: I see . . . . Well, now, sir, the taxpayer, through the Government, of course, spent tens of billions of dollars to discover the secrets of the atom. Why did Congress decide to share these expensive secrets, instead of having the Government make the profits which could be expected in the future?

Congressman Durham: . . . . The Congress, of course, decided, and the country, that we had done a lot of research and development in this field, which, of course,
The Price-Anderson Act itself was a radical departure from the Atomic Energy Act of 1954. Until the passage of the Act, the government received indemnification from industry in exchange for the industry's right to use nuclear fuel which was leased from the federal government between 1954 and 1964. In exchange for such leases, the licensee originally was required by statute to indemnify and hold harmless the United States from all claims arising from the use of the fuel. The Act repudiated and reversed this arrangement. Since 1957, the federal government has indemnified its licensees through the Act. No comment about this change was recorded in the House debates before passage.

A revealing statement by the Joint Committee helps to ascertain congressional intent in passing the Act. In 1957, the Joint Committee on Atomic Energy wrote that, during the ten years with the Act, it hoped the private industry would develop its own insurance program without additional federal help. While Congress no longer entertains this thought, the fundamental structure of the Act remains the
same regardless of the failure of its initial mission. The amount of time for which the Price-Anderson protections extend partly explains the importance of the indemnity provisions. Under the Act as originally enacted no indemnity agreements would have been entered into after August 1, 1967, yet all “persons indemnified were protected for forty years, or the life of the license,” according to the Joint Committee’s 1957 report. The protection of the Act thus extends well beyond the ten year reauthorization period.

As recent nuclear accidents and accurate prediction models show, the potential liability of a nuclear accident greatly exceeds the liability cap. The congressional goal of protecting the public through Price-Anderson is thus not met. In addition, the Act allows for the cost of an accident to be ignored when establishing rates. The government assumes the liability and thus keeps insurance rates artificially low. The cost of insurance and the cost of a potential damage claim are simply left out of the equation by energy planners. The government assumes the risk and the cost of damages, not the utility stockholders or ratepayers.

In 1965, when Congress acted to reduce the government’s liability and to extend the Act’s coverage until 1977, the Joint Committee addressed three major concerns. First, the Committee was worried that state tort law did not provide adequate remedies for damages to all citizens because many states required findings of fault or negligence. These elements were felt to present a nearly

107 “The provisions of this bill provide governmental indemnifications to those licensees who obtain their licenses within 10 years. The indemnification agreement is to run for the life of the license.” H.R. REP. No. 435, 85th Cong., 2d Sess. 9 (1957).
108 See supra note 12 and accompanying text.
109 The basic indemnity of $500 million “shall be reduced by the amount that the financial protection required shall exceed $60,000,000 . . . .” 42 U.S.C. § 2210(c) (1982).
111 The Joint Committee adopted a waiver of defenses provision rather than create a federal tort:

The approach incorporated in the bill, of authorizing the Commission to require waivers as to matters concerning fault and statutes of limitations, will allow achievement of the major purposes of the bill in a way which avoids the necessity of enacting either a Federal rule of absolute liability or a Federal statute of limitations. If one were to go down the road of a Federal statute of absolute liability, we would
impossible burden of proof for the plaintiff to carry. Second, state statutes of limitation would probably invalidate claims due to the latency of many injuries caused by radiation.\textsuperscript{112} Third, the Committee was concerned about procedural stumbling blocks that plaintiffs would encounter when bringing suit, such as determining an appropriate forum. Requiring that all claims arising from a nuclear incident be brought in a single federal district court remedied this problem.\textsuperscript{113} The Joint Committee found a waiver of defense provision to be preferable to a federal tort.\textsuperscript{114}

In 1975, Congress again reauthorized the Act, this time through 1987.\textsuperscript{115} The 1975 Amendment also gave the NRC\textsuperscript{116} the authority to assess nuclear licensees between $2 and $5 million in the event of a nuclear accident.\textsuperscript{117} This prospective assessment reduced the amount

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\[\ldots\] have to decide whether there was any part of State law which would continue to be applicable or not.

\textit{Hearings Before the Joint Committee on Atomic Energy on Proposed Amendments to the Price-Anderson Act Relating to Waiver of Defenses, 89th Cong., 2d Sess. 105-07 (1966)} [hereinafter \textit{Waiver of Defense Hearings}]. The waiver of defense provision Congress finally adopted was contingent upon the classification of a disaster as an "extraordinary nuclear occurrence" by the Nuclear Regulatory Commission. An extraordinary nuclear occurrence is defined as "an event resulting in substantial offsite release of radiation and likely to result in significant personal injury or damage to property." 42 U.S.C. §§ 2014(3), 221O(n)(1) (1982). After the declaration of an extraordinary nuclear occurrence the waiver provisions apply. Id. The extraordinary nuclear occurrence designation has been unpopular and controversial from its beginning. \textit{Waiver of Defense Hearings, supra} at 74, 75 (recording a heated exchange between Congressman McCulloch and Professor Arthur W. Murphy, Columbia Law School). \textit{See also} W. PROSSER, HANDBOOK OF THE LAW OF TORTS 6 (4th ed. 1971). For a detailed criticism of the extraordinary nuclear occurrence threshold, see Note, "Extraordinary Nuclear Occurrence," \textit{supra} note 27. The NRC failed to classify the Three Mile Island accident an extraordinary nuclear occurrence. For a discussion of the role played by the NRC in regulating nuclear power producers, see Pollard, \textit{After TMI: The Lesson Unlearned}, Philadelphia Inquirer, March 28, 1983, at A 9, col. 1.

\textsuperscript{112} Strip Report, \textit{supra} note 13 and accompanying text.

\textsuperscript{113} \textit{Waiver of Defense Hearings, supra} note 111, at 105-07.

\textsuperscript{114} \textit{See supra} note 111. For an interpretation which arrives at the same result, see \textit{Duke Power}, 438 U.S. at 65-66.


\textsuperscript{116} The Atomic Energy Commission was abolished and all functions of the Commission, the chairman, members of the Commission, and the officers and components of the Commission were transferred to and vested in the Nuclear Regulatory Commission and the Energy Research and Development Administration, with certain exceptions. 42 U.S.C. § 5814 (1982) (originally enacted as Act of Oct. 11, 1974, Pub. L. No. 93-438, 88 Stat. 1233).

of federal indemnity by increasing the amount of private funds available for compensating victims of a nuclear accident while keeping the over liability cap at $560 million.\footnote{The liability cap is a nebulous concept. The relevant section states: (e) The aggregate liability for a single nuclear incident . . . shall not exceed (1) the sum of $500,000,000 . . . 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 . . . .} 42 U.S.C. § 2210(e) (1982). The federal indemnification may reach astronomical amounts of money if a nuclear accident reaches the level of damages predicted, and if Congress determines that the appropriate and necessary step is to pay damages unavailable from the utility companies and which the government has agreed to pay.

The Price-Anderson Act, then, is a system of forced statutory guarantees and protections. While it has achieved one of its two stated goals—development of a private nuclear power industry—there is no way to know whether this formula will protect the public after a nuclear disaster. The element of punitive damages in this system is, to date, not statutory. It has been established through litigation and judicial interpretation of statute,\footnote{See infra notes 130-225 and accompanying text.} not debate and legislation in Congress. Congress should codify a well thought out punitive damage provision.

When the Price-Anderson Act was developed in 1957, fear of an accident was small and faith in the industry was high. The bill's Senate sponsor thus felt comfortable setting the $560 million liability cap arbitrarily. Senator Clinton Anderson, one of the sponsors of the original version of the Act, described the process of choosing the sum by stating:

> In suggesting $500 million, I was trying to see if we could get some figure which would not frighten the country or the Congress to death and still solve the problem which the producers of parts face, and which the fabricator of the entire reactor faces, and which the operator of that reactor would eventually face once he puts it in operation.\footnote{Governmental Indemnity and Reactor Safety Hearings Before the Joint Committee on Atomic Energy, 85th Cong., 1st Sess. 32 (1957).}

According to the 1957 Joint Committee, time, oversight by federal regulators, and self regulation by the nuclear power industry would improve safety features until risk was insured solely through private means.\footnote{See supra note 19. The NRC is often criticized for being a captive agency. In a 1986 Wall Street Journal article it was reported that:} Modifications in the Price-Anderson Act, then, can be seen
as efforts to make an unrealistic goal realistic: protecting the public after a disaster (with damages potentially reaching billions of dollars) by actually limiting the amount of damages collectable and indemnifying the industry's risk.\textsuperscript{122}

The Committee reports, hearing records, and the statutory language of past Price-Anderson action suggest that the Joint Committee on Atomic Energy based its conclusions on subjective criteria in order to achieve a previously determined goal of privately developed, nuclear generated electricity for household use.\textsuperscript{123} The subjective

\begin{itemize}
  \item [R]egulators just don't seem willing to insist that safety improvements be made. Before the [June 1985] accident at Davis-Besse [in Toledo, Ohio], the NRC had identified the need for an additional backup cooling pump. Toledo Edison disagreed and the "NRC never felt strongly enough to just say 'put the pump in,'" says Joe Williams, senior vice president for nuclear operations at the utility. So the pump wasn't installed.

  When the accident happened last June, both of the normal cooling pumps failed, and the only thing available was a small pump not designed for the job. Only "outstanding performance" by plant operators averted likely damage to the plant's nuclear-fuel core from overheating . . . .

  Wall S. J., May 5, 1986, at 1, col. 6. In an assessment of the NRC in the WASHINGTON POST, a number of instances were reported where NRC investigations dealt lightly with utilities. "NRC officials say it is unrealistic to expect a hard-nosed approach from the commission's staff, which is under considerable pressure to process utility licenses.

  "The commission's shortcomings [are blamed] on 'a wellmeaning desire to see nuclear power succeed.'" Washington Post, April 8, 1986, at A1, col. 6.

\textsuperscript{122} In 1957 the AEC commissioned the first comprehensive study of risk associated with the operation of nuclear power plants. The report concluded that the worst case scenario based on the 1950's demographics and reactor specifications would result in a maximum 3400 deaths and 43,000 injuries, with $7 billion in property damage. AEC, Theoretical Possibilities and Consequences of Major Accidents in Large Nuclear Power Plants, WASH-740. See also supra note 77. In 1964 members of the Joint Committee suggested that WASH-740 be updated. It was assumed that the update would conclude a lowering of risk due to improved safety measures. The data, however, showed that increases in scale and changes in the sitings of reactors had increased risk to a worst case of 45,000 early deaths, contamination of 1,863 square miles of land and $18 billion in property damage. AEC, Papers on Update of WASH-740 (1964) (available at the NRC Public Document Room, Washington, D.C.). See also Jacks, The Public and the Peaceful Atom: Participation in AEC Regulatory Proceedings, 52 Tex. L. Rev. 466, 470 n.7 (1974). With this information in hand, the members of the Joint Committee on Atomic Energy based the liability cap of the Price-Anderson amendments on subjective values such as ease of passage, sense of security provided the industry, and confidence that an accident would not occur. The much maligned Reactor Safety Study (RSS) of 1975 set its conservative worst-case estimates at 3,300 early deaths, 45,000 early illnesses and $14 million in property damage. NRC, Reactor Safety Study: An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants, WASH–1400, NUREG–75/014 (Oct. 1975). For an update of the RSS, see Strip Report, supra note 81. See generally supra notes 77, 120 and accompanying text.

\textsuperscript{123} Green, supra note 76, at 480. See also Selected Materials on Atomic Energy Indemnity Legislation, Subcomm. on Legislation of the Joint Comm. on Atomic Energy, 89th Cong., 1st Sess. I, III-IV (1965) ("It would be difficult to overestimate the beneficial impact which this legislation has had . . . . Tremendous strides have been made since 1957 in the field of generating electricity by nuclear power plants, and these accomplishments are due . . . . to the
criteria Congress used in developing the Price-Anderson Act includes faith in the technology, belief that the possibility of a nuclear accident was extremely remote and thus the liability cap could be arbitrary and small, and the political reality that the Act should be passable in Congress as well as comforting to the public.124 The passage of time has disproven these beliefs.

By first looking at the Supreme Court’s interpretation of Price-Anderson, and finally analyzing the competing policy goals and pressures within the Act, the best role for punitive damages within the system can be defined.

C. Judicial Interpretation of Price-Anderson

Three major cases form the Supreme Court’s interpretation of Price-Anderson. In *Duke Power Co. v. Carolina Environmental Study Group, Inc.*,125 the Supreme Court held that the provisions of Price-Anderson were constitutional because the Act provided remedies to victims of a nuclear accident. In *Pacific Gas & Electric Co. v. State Energy Resources Conservation & Development Commission*,126 the Supreme Court held that, while the states may not regulate the safety of a nuclear reactor, the states do have a fundamental interest in deciding whether to pursue nuclear power. Furthermore, the Court held that state law plays an integral role in the “complex scheme to promote the civilian development of nuclear energy,”127 thus laying the groundwork for the Court’s later holding in *Silkwood v. Kerr-McGee Corp.*128 *Silkwood* went further than either *Duke Power* or *Pacific Gas & Electric*, and held that state tort law governs the awarding of damages following a nuclear accident, that awarding punitive damages is not contrary to federal public policy or federal statute, and was therefore not preempted.129

cooperation of private industry with the U.S. Government in the program—cooperation which the Price-Anderson Act permitted and fostered.” (joint statement of Chet Holifield, Chairman, Joint Committee on Atomic Energy, and John O. Pastore, Chairman, Subcomm. on Legislation).

124 See supra note 120 and accompanying text; Green, supra note 76, at 498–502.


126 461 U.S. 190 (1983). See also Northern States Power Co. v. State of Minnesota, 447 F.2d 1135, 1143 (8th Cir. 1971) aff’d mem., 405 U.S. 1035 (1972) (states are preempted from regulating the safety of nuclear generating facilities due to the pervasive federal regulatory scheme in the area of nuclear safety pursuant to the supremacy clause of the United States Constitution).

127 461 U.S. at 194.


129 Id. at 258.

The Supreme Court in *Duke Power*\(^\text{130}\) held that the Price-Anderson provisions of the Atomic Energy Act were constitutional.\(^\text{131}\) The plaintiff (respondent) argued that the Price-Anderson Act’s remedial scheme violated the due process clause.\(^\text{132}\) Price-Anderson, the plaintiff argued, arbitrarily changed the plaintiff’s property rights by creating the source of the underlying injury and limiting the recovery arising from the injury.\(^\text{133}\) The Supreme Court accepted the district court’s finding that, without the Price-Anderson protections, no nuclear power industry would exist. According to the Supreme Court in *Duke Power*, there exists “a ‘substantial likelihood’ that the . . . nuclear plants would be neither completed nor operated absent the Price-Anderson Act . . . .”\(^\text{134}\)

Although the Supreme Court accepted the finding that without Price-Anderson there would be no nuclear power industry, the Court based its holding on the recognition of Congress’ right, with which the Court would not interfere, to establish an economic regulation.\(^\text{135}\) The Court would “defer to the congressional judgment unless it is demonstrably arbitrary or irrational.”\(^\text{136}\) The Court then went on to hold that “[w]hen examined in light of this standard of review, the Price-Anderson Act . . . passes Constitutional muster.”\(^\text{137}\) Once the Court decided that limiting liability was not arbitrary or irrational, the Court stated that whether the $560 million liability ceiling itself was rational was beyond the point. The Court stated:

> Given our conclusion that, in general, limiting liability is an acceptable method for Congress to utilize in encouraging the private development of electric energy by atomic power, candor

\(^{130}\) 438 U.S. 59 (1978).

\(^{131}\) Id. at 84.

\(^{132}\) Id. at 69.

\(^{133}\) Paragraph 19 of the complaint reads in part:
> Since the Price-Anderson Act provides the victims of a nuclear disaster no benefit while at the same time limiting their right to recovery for their losses to approximately [two and one half percent] of such losses, the . . . $500 million limitation would, in the event of a nuclear disaster, deprive the persons injured . . . of property rights . . . .

Id. at 68 n.12.

\(^{134}\) Id. at 75. See also id. notes 21–22.

\(^{135}\) Id. at 84–85.

\(^{136}\) Id. at 84. “It is by now well established that [such] legislative Acts . . . 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.” Id. (citing *Usery v. Turner Elkhorn Mining Co.*, 428 U.S. 1, 15 (1976)).

\(^{137}\) 438 U.S. at 84.
requires acknowledgement that whatever ceiling figure is selected will, of necessity, be arbitrary . . . . This is not, however, the kind of arbitrariness which flaws otherwise constitutional action.\footnote{138 Id. at 86 (footnote omitted).}

Because of the federal safety standards and the potential damages that a utility would face following a nuclear accident, the Court found sufficient safeguards against creating a cavalier industry.

The relevance of Duke Power to the issue of punitive damages derives from the Court's reasoning that the federal indemnification system, and the liability cap, do not encourage the builders and owners of nuclear power plants to act irresponsibly.\footnote{139 Id. at 87.} According to the Court, Price-Anderson does not violate the due process and equal protection clauses of the fifth amendment because sufficient remedies remain in the event of a nuclear accident. The Court found that the federal government's scheme guaranteed a responsible industry, protection of individual rights, and adequate compensation following an accident.\footnote{140 Id. at 87–88.} This conclusion was predicated on existing state tort law remedies that in many instances include provisions for payment of punitive damages. Congress determined that state law would apply. Congress only modified state tort law by taking away defenses in some instances and setting a cap on awards, not by taking away causes of action.\footnote{141 Id. at n.33.} Thus, under the reasoning in Duke Power, a victim of a nuclear accident still has a cause of action for punitive damages.


Another important Atomic Energy Act case decided by the Supreme Court was Pacific Gas & Electric.\footnote{142 461 U.S. 190 (1983).} The Court's federal preemption analysis in Pacific Gas & Electric led directly to the Court's holding a year and a half later in Silkwood.\footnote{143 464 U.S. 238 (1984).} In Pacific Gas & Electric, the issue was whether a state's decision to deny permission to build a nuclear power plant was regulation of safety which is a domain reserved to the federal government through the Atomic Energy Act.\footnote{144 461 U.S. at 194–95.} The State of California passed a statute which pro-
hibited construction of nuclear power plants in the state until the federal government developed adequate regulatory standards for the permanent disposal of radioactive waste.\textsuperscript{145} The state argued that its motive was economic, not safety related, and was therefore not preempted by the Atomic Energy Act.\textsuperscript{146}

The Court agreed with the state. While the Court discussed at length the hazards associated with nuclear waste and the risk created by spent nuclear fuel, the Court held that California's stated economic motive was not clearly pretextural. California's decision to ban new nuclear construction until the spent fuel issue is resolved was thus not preempted by federal law.\textsuperscript{147} The Court went on to hold that Congress, in passing and reauthorizing the Atomic Energy Act, did not intend to entirely displace state regulation.\textsuperscript{148} In so holding, the Court stated that "[e]ven a brief perusal of the Atomic Energy Act reveals that, despite its comprehensiveness, it does not at any point expressly require the States to construct or authorize nuclear powerplants or prohibit the States from deciding . . . not to permit . . . any further reactors."\textsuperscript{149}

Thus, the importance of Pacific Gas & Electric resides in its bolstering of the contention that Congress, throughout its consideration of the Atomic Energy Act, felt that the states and the federal government were partners in the regulation of federally licensed nuclear facilities.\textsuperscript{150}

The Court summed up federal nuclear policy as a "complex scheme to promote the civilian development of nuclear energy, while seeking to safeguard the public and the environment from the unpredictable risks of a new technology."\textsuperscript{151} The Court also described the functioning of the relationship between the federal and state authority in the nuclear power area: "[t]he interrelationship of federal and state authority in the nuclear energy field has not been simple; the federal regulatory structure has been frequently amended to optimize the partnership."\textsuperscript{152}

\textsuperscript{145} Id. at 195–97.
\textsuperscript{146} Id. at 213.
\textsuperscript{147} Id. at 207–09 and nn.18–20.
\textsuperscript{148} Id. at 205.
\textsuperscript{149} Id.
\textsuperscript{150} Id. at 194. “Thus, Congress legislated here in a field which the States have traditionally occupied . . . . So we start with the assumption that the historic police powers of the States were not to be superseded by the Federal Act unless that was the clear and manifest purpose of Congress.” Id. at 206 (quoting Rice v. Sante Fe Elevator Corp., 331 U.S. 218, 230 (1947)).
\textsuperscript{151} 461 U.S. at 194.
\textsuperscript{152} Id. (emphasis added).
Justice Blackmun's concurring opinion in *Pacific Gas & Electric* defines the field of federal preemption in even narrower terms than does the majority. According to Justice Blackmun, if a state can decide how best to meet its energy needs, then the state should be allowed to consider all relevant factors when making the decision, including safety. The determining factor for Justice Blackmun is whether a state has granted permission to build a nuclear reactor, not whether denying the permission was based upon safety. Justice Blackmun argued that the state has the power to decide whether or not the plant should be built, but “if the decision is to permit construction, the subsequent determination of how to construct and operate those plants” is for the federal government.

Justice Blackmun agreed with the majority that the petitioner's premise that Congress intended the state to accept nuclear power was flawed. He argued that Congress intended to give the state the opportunity to use nuclear power if demand existed for the new form of energy and if the state was willing to accept the risk. Using Justice Blackmun's reasoning, the State of California was thus acting within its power when it applied state law to prohibit the construction of nuclear plants due to the state's concern about “adequate capacity” for the spent nuclear fuel. The moratorium on the certification of new plants until “there has been developed . . . a demonstrated technology or means for the disposal of high level nuclear waste” was, according to Justice Blackmun, within the

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153 461 U.S. at 223 (Blackmun, J., concurring).
154 Id. at 224. “Congress has occupied not the broad field of ‘nuclear safety concerns’ but only the narrower area of how a nuclear plant should be operated to protect against radiation hazards.” Id.
155 Id. at 226–27.
156 Id. at 225–26.
157 Id.
158 Id. at 226. “Congress has not evidenced a dictatorial intent for every state to build nuclear powerplants.” Id. at 227 (quoting Note, *May a State Say “No” to Nuclear Power? Pacific Legal Foundation Gives a Disappointing Answer*, 10 ENVT. L. 189, 199 (1979) (attacking the lower court ruling in *Pacific Gas & Electric*, 659 F.2d 903 (9th Cir. 1981) which was overturned by the Supreme Court's opinion)).
159 461 U.S. at 227. “Congress did not compel States to give preference to the eventual product of that industry or to ignore the peculiar problems associated with that product.” Id.
160 Id. at 197.
161 Id. at 198 (quoting California's Warren-Alquist Act, CAL. PUB. RES. CODE ANN. §§ 25524.1(b) & 25524.2 (West 1977 & Supp. 1983)). The Court held that only § 25524.2 was ripe for judicial review, but that § 25524.1(b) was not ripe for review only because “we cannot know whether the Energy Commission [of the State of California] will ever find a nuclear plant's storage capacity to be inadequate” and thus “judicial consideration of this provision should await further developments.” 461 U.S. at 203 (citing *Pacific Gas & Elec. v. Energy Resources Comm'n.*, 659 F.2d at 918 (9th Cir. 1981)).
state's control not only because of economic concerns but also because of the state's legitimate concern about risk.\textsuperscript{162}

To extrapolate from this holding, a state's right to control the generation of power within its borders includes the right to employ state law in controlling the breach of its laws, but not the regulation of safety. The majority suggests that a state should control the economic risks flowing from conduct at nuclear power facilities and in the design, construction and operation of nuclear power facilities. Justice Blackmun goes beyond this and argues that, when deciding whether to allow construction of a facility, a state should be able to consider all types of risks, including safety risks. To carry this argument a step further, in order to evaluate the acceptibility of risk posed by the facility, the state should be allowed to examine how its laws affect that risk, including what deterrent effect a state's tort laws may have in preventing negligent management of nuclear facilities. Whether a state's laws would then survive a constitutional challenge under the supremacy clause depends on the Supreme Court's preemption analysis.

The \textit{Pacific Gas \\& Electric} Court's preemption analysis has three elements. Within constitutional limits, Congress may preempt state authority expressly,\textsuperscript{163} through pervasive regulation that infers an intent to preempt any state laws on the same subject,\textsuperscript{164} or when federal and state law applied together would frustrate a federal purpose.\textsuperscript{165} The Court found none of these conditions in \textit{Pacific Gas \\& Electric}.


When the Supreme Court asked a similar preemption question in \textit{Silkwood v. Kerr-McGee,}\textsuperscript{166} the Court again found a partnership between federal and state law, not a conflict.\textsuperscript{167} In \textit{Silkwood}, Karen

\begin{itemize}
  \item \textsuperscript{162} \textit{Id.} at 226–27.
  \item \textsuperscript{163} 461 U.S. at 203.
  \item \textsuperscript{164} \textit{Id.} at 204.
  \item \textsuperscript{165} \textit{Id.}
  \item \textsuperscript{166} 464 U.S. 238 (1984).
  \item \textsuperscript{167} \textit{Id.} at 240–41.
\end{itemize}
Silkwood was a laboratory analyst for Kerr-McGee. In 1974, Kerr-McGee's routine contamination check indicated that Silkwood had been severely contaminated by plutonium over a three day period. Investigation showed that the contamination came from her apartment, which was laced with radioactive plutonium. Conflicting evidence as to whether Kerr-McGee violated federal regulations in the handling of radioactive material was resolved by a jury in favor of Silkwood's estate.

A jury returned a verdict in favor of Silkwood, finding actual damages of $505 thousand and punitive damages of $10 million. Kerr-McGee moved for a judgment notwithstanding the verdict, contending that compliance with federal regulations precluded an award for punitive damages. In denying this motion, the district court held that Kerr-McGee had a duty to maintain the release of radiation to an "as low as reasonably achievable" standard. To Kerr-McGee's argument that, since only a small amount of radioactive material was released, Kerr-McGee could not be found liable, the district court answered that meeting a federal standard did not foreclose liability. The court stated that "[c]ompliance with this [as low as reasonably achievable] standard cannot be demonstrated merely through control of escaped plutonium to within any absolute amount." The Tenth Circuit, however, reversed the district court and held that the award of damages was contrary to federal law and thus was preempted. It further held that since no violation of federal regulation had taken place, there was no liability.

Reversing the Tenth Circuit's broad preemption analysis, the Supreme Court developed further the Pacific Gas & Electric preemption test. In Silkwood, the Court found that the federal government's preemption of the field of atomic energy was not complete. The Court held that the lack of a federal remedy for persons injured by conduct supporting an award of punitive damages.

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168 Id. at 241-44.
169 Id.
170 Id.
171 Id.
174 667 F.2d 908, 923 (10th Cir. 1981).
175 Id. "[A]ny state action that competes substantially with the AEC [now NRC] in its regulation of radiation hazards associated with plants handling nuclear materials" is preempted. Id.
176 Id. at 250-51.
177 Id. at 251. "Congress had no intention of forbidding the States to provide such remedies."
coupled with the legislative history of the Atomic Energy Act and the Price-Anderson Act, evidenced that state tort remedies continued to exist.\textsuperscript{178} Price-Anderson modified state tort law only in that it guaranteed that relief in a suit arising out of a nuclear accident would be equitably distributed,\textsuperscript{179} an action easily brought,\textsuperscript{180} and, following amendments in 1966 and 1975, quickly resolved.\textsuperscript{181} Price-Anderson protects the interests of private industry from awards based upon actual damages in excess of the liability cap, nothing more. Only when industry behavior is not culpable or when the Price-Anderson liability cap is reached, or both, is state tort law affected by federal law.\textsuperscript{182}

According to the \textit{Silkwood} Court, federal regulation of nuclear power occurs on two levels.\textsuperscript{183} First, once a state grants permission to build a nuclear power plant, specific safety regulations that control the entire operation of a plant, from design through construction to operation, are within the federal domain.\textsuperscript{184} Second, the distribution of liability for injuries caused by a nuclear accident is a federal concern as well, pursuant to the Price-Anderson Act.\textsuperscript{185} Through these two arms of regulation, Congress theoretically achieves its dual goal of encouraging private industry and protecting the public.\textsuperscript{186}

\textsuperscript{178} See supra notes 92–107 and accompanying text. \textit{Silkwood} involves a case where Price-Anderson’s award limitation provision is not imposed and the Joint Committee stated in supporting the language of the Act that:

there is no interference with the State law until there is a likelihood that the damages exceed the amount of financial responsibility required together with the amount of the indemnity. At that point the Federal interference is limited to the prohibition of making payments through the State courts and to prorating the proceeds available. S. REP. No. 296, 85th Cong. 1st Sess. 9 (1957).

\textsuperscript{179} 42 U.S.C. § 2210(m) (1982).

\textsuperscript{180} Id. § 2210(n).

\textsuperscript{181} Id.

\textsuperscript{182} Id.

\textsuperscript{183} 464 U.S. at 252. “Congress clearly began working on the Price-Anderson legislation with the assumption that in the absence of some subsequent legislative action, state tort law would apply . . . . Congress was fully aware of the Commission’s exclusive regulatory authority over safety matters.” Id. at 252–53.

\textsuperscript{184} 461 U.S. at 213.

\textsuperscript{185} For accidents below the liability cap it is doubtful that the NRC would ever term an incident an extraordinary nuclear occurrence. The NRC’s criteria for defining an incident as extraordinary is set out at 10 C.F.R. §§ 140.81–140.85 (1986). The regulation is in response to 42 U.S.C. § 2014(j) (1982) and 42 U.S.C. § 2210(m) (1982). The damages resulting from an extraordinary nuclear occurrence would by definition include radioactive poisoning outside of the plant. 42 U.S.C. § 2014(j) (1982). The costs associated with such a release are staggering. See supra notes 73–83 and accompanying text.

\textsuperscript{186} Only through an extraordinary nuclear occurrence would the theory be proven since the
According to the Court's interpretation of Price-Anderson, however, assessing liability for accidents with damages below the Price-Anderson liability cap is governed by state tort law.\(^{187}\) The Silkwood Court stated that "Congress assumed that persons injured by nuclear accidents were free to utilize existing state tort law remedies" below the extraordinary nuclear occurrence threshold.\(^{188}\) Designating a nuclear facility as "safe" by federal standards does not guarantee that those involved in the operation of that nuclear plant will not act negligently or with reckless disregard.\(^{189}\) The NRC has provided specifically for punitive damage awards in its regulations.\(^{190}\) The Court is thus correct in holding that Congress intended to provide for both state remedies and federal regulation.\(^{191}\)

The second element of the Court's analysis shows that no conflict exists between awarding punitive damages and the NRC's federal authority\(^{192}\) to impose civil penalties for violation of safety regula-

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Price-Anderson interference with state law is only triggered by terming an accident an extraordinary nuclear occurrence. 42 U.S.C § 2210(m) (1982).

\(^{187}\) 464 U.S. at 252.

\(^{188}\) Id. The Court also concluded that "Congress assumed traditional principles of state tort law would apply with full force unless they were expressly supplanted." Id. at 255.

\(^{189}\) Id. at 253.

When it enacted the Price-Anderson Act, Congress was well aware of the need for effective national safety regulations. In fact, it intended to encourage such regulation. But, at the same time, 'the right of state courts to establish the liability of the persons involved in the normal way [was] maintained.'

\(^{190}\) 10 C.F.R. § 140.91.

Following the 1966 amendment, the Commission published a form for nuclear energy liability policies and indemnity agreements. After reciting the waivers being made by the licensee in the event of an extraordinary nuclear occurrence, the form contains the following provision: 'The waivers set forth . . . above do not apply to . . . [a]ny claim for punitive or exemplary damages . . . .'


\(^{192}\) See 464 U.S. at 257.
193 The federal regulatory system provides for civil penalties when federal standards are breached. 194 State punitive damages come into play when a defendant's behavior is culpable enough to mandate punishment, not when regulatory standards are breached. 195 Having two standards of review does not cause an impossibility of compliance. 196 In the Atomic Energy Act, Congress provided that the development of nuclear energy should be encouraged "only to the extent it is consistent 'with the health and safety of the public.'" 197 Furthermore, in Pacific Gas & Electric, the Court held that culpable behavior on the part of the producers of nuclear energy should not go unpunished solely because the federal government is a promoter of nuclear power. 198 Finally, a jury is capable of determining whether behavior is culpable. Based on this analysis, no conflict appears between awarding punitive damages based upon state law, and state legal systems are not capable of reviewing a case dealing with the results and causes of a nuclear accident.

Justice Blackmun's dissent in Silkwood argues that Congress has determined that states are incapable of handling the technical aspects of regulating nuclear power. According to the Justice, "[s]tates [are] without the technological expertise necessary to regulate [nuclear power]. . . . Yet the Court concludes that Congress intended to allow a jury to impose substantial penalties . . . for failure to follow what the jury regards as [in]adequate safety procedures." 199

Justice Blackmun, however, misconstrues the role of a jury in an action for punitive damages. The jury's importance is not in passing on the regulatory rules or the complexities of nuclear power, but

193 Id.
195 For a discussion of tort theory, see supra note 185 and accompanying text.
196 464 U.S. at 257-58. For a discussion of the Court's analysis of the provision, see supra note 29.
197 464 U.S. at 257 (citing 42 U.S.C. § 2013(d) (1982)).
198 461 U.S. at 222. "[T]he promotion of nuclear power is not to be accomplished 'at all costs'." Id.
199 464 U.S. at 259.
200 The process for generating nuclear electricity is not difficult to understand. For a general description of how nuclear reactors work, see CALIFORNIA STATE ASSEMBLY COMMITTEE ON RESOURCES, LAND USE AND ENERGY, Reassessment of Nuclear Energy in California: A Policy Analysis of Proposition 15 and its Alternatives, 67-69 (1976). Highly toxic radioactive fuels are used in a reactor "core" to make up pencil-thin "fuel-rods." See id. at 15. A nuclear chain reaction is allowed to take place, where the heavy, unstable atoms are freed to split, generating heat. Id. at 14. As with any other steam turbine system, the heat from the reactor (or furnace) is used to boil water which turns turbines to manufacture electricity. Id. Escaping radiation is trapped by the rods in which the fuel is stored. A neutron-absorbing substance is used to control the reaction. Id. Dropping "control-rods" of this substance into the reactor
is in finding whether a defendant committed an egregious act that causes harm.\textsuperscript{201} The determination of wrongful behavior is not a technological one. Rather, it is a role for which juries are suited.\textsuperscript{202} In fact, Justice Blackmun himself recognized that the states must have a role in regulating nuclear power when he wrote in \textit{Pacific Gas \& Electric} "[t]here is, in short, no evidence that Congress had

core stops the reaction, or "scrams" the reactor. \textit{Id.} Dropping the control rods, however, generates more heat initially than does the reaction. \textit{Id.} Cores are cooled with water. Failure of the water cooling systems can result in a "meltdown" of the reactor core and the concrete containment building in which the reactor is wrapped. \textit{Id.}

In 1957 Congressman Holifield described the process in simpler terms to his colleagues:

\begin{quote}
The first question is, what takes place in an atomic reactor? Atoms are split, which causes heat in a process called a chain reaction, which is under control.

What takes place inside an atom bomb when it explodes? Atoms are split in a noncontrolled chain reaction. Uncontrolled they are allowed to run wild.

What happens regarding radioactivity in both cases? Both a bomb and a reactor create radioactivity, deadly radioactivity, that can go through several feet of concrete and steel. In a reactor you contain the radioactivity behind walls of concrete, steel, or lead. In a bomb you release the radioactivity into the environment. As long as the controls work on a reactor, you are going to contain that radioactive material inside this reactor . . . .

The inside of a reactor becomes contaminated to a degree equivalent to the contamination of a bomb. As long as it is behind those walls it is safe. If that reactor gets out of control . . . [radioactive material] is spread over the environment for many miles, possibly many hundreds of miles, and carried downwind on the breeze . . . .

That is why the insurance companies will not cover these reactors to the extent that the people who are building them want them covered. They do not know. They sell their insurance on the basis of tables of experience. That is free enterprise and it should be that way. But 139 American insurance companies backed up by an agreement with Lloyds of London have said, "We will not write any more than \$60 million of insurance."
\end{quote}

\textsuperscript{103} CONG. REC. 10,714 (1957).

\textsuperscript{201} Deciding whether a nuclear reactor is "safe," and defining what "safe" means, when regulating nuclear reactors is highly technical and the decision making process demands high levels of expertise. Furthermore, nuclear energy generation is a national industry with numerous reactor designs and more than one manufacturer. Thus it makes sense to have a central regulatory structure where expertise is concentrated and national standards set. On the other hand, once safety standards are achieved and applied, whether the safety standards have been breached is an ascertainable fact that laymen are capable of deciding. Whether breached through actions or behavior so culpable as to justify punishment is also ascertainable by a lay jury. In other words, the NRC sets regulatory standards and sees that the standards are enforced. This is the job of the NRC and the sole domain of the federal government. A breach of safety standards which leads to other actionable offenses does not upset the federal law. Judging whether grossly negligent, wrongful, or otherwise culpable behavior is the cause of a breach of regulations is not a technical decision nor is it safety regulation. \textit{See e.g.}, \textit{Northern States Power}, 447 F.2d 1135 (8th Cir. 1971), \textit{aff'd mem.}, 405 U.S. 1035 (1972).

a 'clear and manifest purpose' . . . to force States to be blind to whatever special dangers are posed by nuclear plants.\textsuperscript{203}

The purpose of federal nuclear safety regulation is to protect the health and safety of the public.\textsuperscript{204} The goal of punitive damages is to atone for an act that may or may not violate those safety standards. What the Supreme Court has achieved through its holdings in \textit{Duke Power},\textsuperscript{205} \textit{Pacific Gas & Electric},\textsuperscript{206} and \textit{Silkwood},\textsuperscript{207} is a complicated balance between federal, state, and private rights and interests in the area of nuclear generated electrical power.

\section*{D. Recent Congressional Action in Preparation of Reauthorization and in Reaction to the Supreme Court's Interpretation of the Price-Anderson Act}

Recent events, such as the Three Mile Island and Chernobyl nuclear accidents, and general changes in societal values have given Congress a broader perspective on a variety of issues, including nuclear power. Committees in both Houses in the 99th Congress held extensive hearings and issued reports on the pending reauthorization of Price-Anderson.\textsuperscript{208} Congress did not pass reauthorization legislation in either House during the 99th Congress, yet Congress laid the groundwork for lawmaking in the 100th Congress. By examining the work of the various congressional committees, one may ascertain the Congress' sense of the role for punitive damages in the regulatory scheme.

The Senate Committee on Energy and Natural Resources reported out a bill in the 99th Congress\textsuperscript{209} to reauthorize the indemnification scheme for 25 years, increase the amount of funds readily available to compensate victims, provide for the gradual increase of the liability cap, and broaden the scope of the provision to cover nuclear waste disposal concerns and nuclear incidents involving theft

\begin{flushleft}
\textsuperscript{203} 464 U.S. at 257.
\textsuperscript{204} Id.
\textsuperscript{205} 461 U.S. 190 (1982).
\textsuperscript{207} Hearings were held in a number of different congressional committees because in 1976 the Joint Committee was abolished. Its duties were spread among the House Committees on Interior and Insular Affairs, Armed Services, Commerce, Foreign Affairs, and Science and Technology and the Senate Committees on Energy and Natural Resources, Armed Services, and the Environment and Public Works. Act of Sept. 20, 1977, Pub. L. No. 95-110, § 1, 91 Stat. 884.
\textsuperscript{209} Id. Compare supra note 105.
\end{flushleft}
of nuclear materials. The Senate bill would also increase the liability of industry, strengthen the congressional commitment to pay for damages over and above the liability limit and provide for the reimbursement of states for "precautionary evacuations."

The House of Representatives proposed reauthorizing Price-Anderson for ten years. The House bill would increase industry's liability to a greater extent than the Senate bill, and increase the "maximum deferred premium" per accident per reactor to $63 million, raising a fund to pay damages of $6.363 billion. The House bill also reacts to the Court's language in Silkwood. The Committee on Energy and Natural Resources determined that the punitive damages issue raised complex matters about which the Committee members could not agree. It therefore left the punitive damage issue out of the reported bill. The Committee on Science and

210 S. REP. No. 310 at 19.
212 See Price-Anderson Amendments Act of 1986, Part 1, H.R. REP. No. 636 [hereinafter Part 1]. One of the two members of the original Joint Committee on Atomic Energy still serving in Congress defended the Price-Anderson Act in the Committee Report and attacked the idea of allowing claims for punitive damages during the last session.

It is totally inconsistent to entertain the imposition of punitive damages for behavior which is wholly subject to the most stringent Federal regulations ever developed.

Unfortunately, there will always be those who will be dissatisfied with the Price-Anderson system. They will be dissatisfied because they know full well that the Price-Anderson Act plays a key role in the continuation of America's nuclear energy option. Some self-proclaimed "consumer groups" and "safe energy advocates" would rather sell-out the public for the sake of shutting down a vital industry, than work to improve the Price-Anderson Act within its stated goals.

Part 1, supra, at 55 (additional views of Mr. Manuel Lujan, Jr.).
213 Id. at 10.
214 Id. at 15. See also S. REP. No. 310 supra note 209, at 11. The House provision would in effect increase private liability to roughly $6,563,000,000 per accident. Id. The Senate provision increases the liability cap to roughly $2,500,000,000. The House's version includes such a large indemnity floor that the Senate's punitive damage provision, if added to the House's 1986 bill, would have little effect in many conceivable disaster scenarios. See supra note 209 at 20.
215 Part 1 supra note 212 at 15.
216 464 U.S. 238.
217 The Energy and Natural Resources Committee had a difficult time coming to terms on a punitive damages provision. The original amendment would have allowed punitive damages so long as the awards were not paid by insurance companies or government funds. The amendment would have disallowed payment of punitive damages through "either private financial protection or government indemnity funds . . . . A serious question arose, however, whether the amendment subjected NRC licensees and DOE contractors to unlimited liability for punitive damages, thereby undermining one of the primary tenets of the Act." Part 1, supra note 212, at 26 (emphasis added in the last clause of second sentence).
218 Id. "Notwithstanding this action, the Committee remains opposed to punitive damage awards in connection with claims arising under the Price-Anderson Act because such awards
Technology, however, took a strong stance within the area of its review\textsuperscript{219} to condemn the payment of punitive damages by the government.\textsuperscript{220} The Committee on Science and Technology concluded that the goal of punitive damages should be achieved by "civil or criminal penalties imposed by the Government."\textsuperscript{221}

Since Congress has decided to support the development of nuclear power and has premised this decision on a complex balancing of risks and benefits, Congress should not be ambiguous in dealing with punitive damages. The regulation of the industry and the regulation of a subsequent disaster should work toward the same end.

III. SUGGESTED REFORMS OF THE PRICE-ANDERSON ACT

Congress should incorporate the judicial interpretation of the Price-Anderson Act into any liability and indemnification amendments. Three basic concerns raised by the Court need to be addressed in a punitive damages provision. First, Congress needs to draw a distinction between suits arising under both Price-Anderson and state law and suits arising solely under state law. Second, Congress must determine how a plaintiff will enforce a punitive damage award and how these rights rank among the various claims arising out of the same nuclear accident. And third, Congress must establish the tort standard that will apply or expressly state in legislation that state law shall apply.

could have the effect of diminishing the limited funds available to compensate actual injuries."

\textit{Id.}


\textsuperscript{220} Id. at 12. "The Committee's thirteenth amendment prohibits recovery against the government . . . . Besides the fact that punitive damages could result in very large awards paid by the government for non-physical damages, the Committee does not believe the federal government should . . . . pay punitive damages for any purpose." \textit{Id.}

\textsuperscript{221} Id. at 13.

If a person's actions constitute legal malice, that is, if the person intended to cause an accident, then those individuals should be punished by civil or criminal penalties assessed by the government and not by penalties ultimately assessed against the government . . . .

The fourteenth Committee amendment [to the Act] requires the Secretary of Energy to report to the Congress on the civil and criminal liability of any contractor or other person indemnified for intentionally causing, or attempting to cause, a nuclear accident . . . . If existing authority is insufficient, the Secretary is directed to make recommendations to the Congress in his report . . . .

\textit{Id.} at 13 (emphasis added).
A. Awarding Punitive Damages in Cases Involving Price-Anderson Versus Cases Not Involving Price-Anderson

For nuclear accidents that do not fall under the definition of an extraordinary nuclear occurrence and do not result in damages which exceed the overall liability cap, punitive damages should be assessed and levied under existing state law. Congress should not protect the nuclear power industry from the state’s police power when the accident falls below the level of federal financial involvement as defined by Price-Anderson. This policy neither frustrates the federal regulatory structure nor has been preempted by Congress’ statutory scheme for promoting, regulating, and controlling a private nuclear industry. This conclusion is justifiable based on the legislative history of Price-Anderson, the Supreme Court’s holding in Silkwood, and the logical differences between punitive jury awards and regulatory enforcement fines.

Punitive damages arise when the defendant’s behavior has been intentional and deliberate and has the characteristics of an outrage. The payment of damages in such cases is far more than a fine. The plaintiff is being paid for an intangible injury that is otherwise non-compensable. Regulatory violations occur due to an objective failure to comply with a given regulation. Courts, on the other hand, base punitive damage awards on the courts’ subjective level of a defendant’s responsibility for the harm.

A system of apportionment among plaintiffs awarded punitive damages is necessary if the damages from a nuclear accident reach the federal liability cap. Evidence shows a number of scenarios where damages above the liability cap can occur without reaching the designation of an extraordinary nuclear occurrence. Without this designation, the utility would waive no defenses, and the suit could be treated under appropriate state law. The resulting punitive award from an accident with damages above the liability cap, but which is not deemed an extraordinary nuclear occurrence, should be apportioned among all victims regardless of their standing to bring

\[\text{References:}\]
\[223\] Id.
\[224\] Id.
\[226\] See generally Meyer, supra note 12.
\[227\] It is assumed that suits arising out of nuclear accidents would be best filed as class actions under FED. R. CIV. P. 23(b)(3), thus necessitating a shared judgment.
a punitive damages claim. Furthermore, the punitive damage claim should be paid by the utility, not the federal government. When the damages for a nuclear accident exceed the Price-Anderson Act's liability cap, Congress should allow these damages to be assessed against the utility itself, and should provide for a scheme of distributing the punitive damages among the victims. This result is not mandated by the Supreme Court's holding in *Silkwood*. The holding in that case would, in fact, probably result in no punitive damages being paid when damages exceed the liability cap, and thus Congress should codify a punitive damage rule to prevent such a result. The federal government's role should be limited to establishing a procedure for enforcement and a timetable for payment of punitive damages through the NRC. As the federal agency responsible for regulating the nuclear industry, the NRC is in the best position to act as trustee for claimants suing an interstate industry.

The complex balancing of the rights and responsibilities within federal nuclear power policy makes the apportionment of punitive damages necessary. First, it is difficult to imagine that one plaintiff in the class of injured parties would have a distinct claim based upon punitive standards. Second, regardless of the nexus of the claim, Congress has clearly determined that the potential costs of nuclear power are to be shared by all members of society. To the extent possible, punitive damages must be awarded to avoid profit-making by a claimant. A punitive award should be allocated as if it were a compensatory award under Price-Anderson.

Such an allocation of the benefits achieves two goals: fairness in the allocation of the defendant's assets, and the weeding out of claims

228 The class bringing suit should not benefit at the expense of the class of latent-injury victims, who would not suffer actual damages for a number of years following an accident. The punitive damages should be collectable through enforcement only after all justifiable compensatory claims are awarded and payment systems for those judgments secured. The punitive award then would become a *de facto* element of a compensatory award to victims suffering latent injuries and death due to the accident.

229 See Part 2, *supra* note 100, at 12.

Punitive damages are intangible damages which are recoverable at the discretion of the jury or the judge in a non-jury trial. Besides the fact that punitive damages could result in very large awards paid by the government for non-physical damages, the Committee does not believe that the federal government should, as a rule pay punitive damages for any purpose.

*Id.*


231 This protection includes the apportionment of the award as well as any other action Congress agrees to take in the event of an accident involving damages in excess of the statutory cap. See 42 U.S.C. § 2210(e) (1982).
based upon greed. The fairness in allocating benefits to all is in keeping with the Act's principle of allocating costs to all members of society.\(^{232}\) Spurious claims are avoided by removing the claimant's incentive to sue. Thus, risk and benefit continue to be spread equitably and utilities need not fear nuisance suits asking for punitive damages.

**B. Exposing the Utilities to Liability for Culpable Behavior**

The federal government has stated its reluctance to expose a utility to unlimited liability in compensatory damage suits, and thus is leery of opening utilities up to unlimited liability in punitive damage suits.\(^{233}\) This makes no sense, however, when one considers that the public is exposed to uncompensable injury and damages following a nuclear accident, injury that the industry should pay for when its behavior reaches a high level of culpability. If Congress' sole goal were to promote nuclear power, then congressional concern about liability for culpable harm would be logical.\(^{234}\) As the law now stands, the lack of financial risk being borne by industry, which would promote a utility's interest in security and safety, increases the risk to the American public without enhancing the viability of nuclear energy.

In situations where the Nuclear Regulatory Commission declares a nuclear accident an extraordinary nuclear occurrence,\(^{235}\) a change in the statute must be made. The waiver of defenses should not

\(^{232}\) Id. See generally Meyer supra note 12.

\(^{233}\) The House Committee on Interior and Insular Affairs applied this logic in stating:

The Subcommittee on Energy and the Environment approved an amendment that would have prohibited use of either private financial protection or government indemnity funds available under the Act to pay punitive damage awards. The purpose of this amendment was to prevent the limited funds available for compensating actual injuries from being used to pay punitive awards. A serious question arose, however, whether the amendment subjected NRC licensees . . . to unlimited liability for punitive damages, thereby undermining one of the primary tenets of the Act.

Part 1 supra note 212, at 26. But Congress never agreed to protect utilities from any responsibility for their actions in order to promote nuclear power. Congress' policy of promoting nuclear generated electricity does not mean Congress agreed to protect utilities from suits arising out of their own culpability.

\(^{234}\) The Committee on Interior and Insular Affairs added language in its bill H.R. 3653 requiring Congress to shoulder the burden of paying damages above the liability cap:

[T]he Congress will thoroughly review the particular incident . . . and take whatever action is determined to be necessary (including approval of appropriate compensation plans and appropriation of funds) to provide full and prompt compensation to the public for all public liability claims resulting from a disaster of such magnitude.

Part 1 supra note 212, at 44 (emphasis added).

apply to claims for punitive damages in this situation. The waiver of defenses would make an accurate allocation of fault impossible and would take too much power away from the jury. Punitive damage awards, by law based upon findings of fault or culpability, cannot be awarded without the defendant presenting to the jury defenses explaining why its behavior is not punishable.

C. A Model Statutory Provision

Punitive Damages
(a) Nothing in this act shall be construed to limit awards for punitive damages based upon state tort law provided that the damages are proved to be the result of gross negligence, malfeasance, nonfeasance or wilful misconduct.
(b) No punitive damage award may be granted unless-
   (i) no part of the punitive damage award is paid by a private insuror or by the federal government, and;
   (ii) the amount of the award is set aside in trust for victims of a nuclear incident who suffer from latent injuries, or injuries based on early and chronic radiation doses that have a latency of up to ten years followed by a period of risk for the remainder of the victim’s life and for injuries such as genetic defects; still births and miscarriages caused by radiation induced injury, but not limited to the injuries enumerated.
(c) Damage awards for the class of plaintiffs suffering from latent injuries shall be made up of a pro rata share of the punitive damage fund, if any exists, and federal indemnification funds or money from the defendant nuclear industry or facility to make up the difference between the amount of the punitive damage trust share allocated to each victim provided that the total amount awarded does not exceed the pro rata compensatory award amount awarded and allocated [pursuant to 42 U.S.C. § 2210] to early fatality, early injury and early property damage claimants in any original litigation.

IV. Conclusion

If the nuclear industry is allowed to continue in its present form, the Price-Anderson Act must remain an element of United States policy. The Act, however, can only meet its two-part goal of protecting the public and promoting the nuclear industry if the industry is made expressly liable for punitive damages arising out of gross negligence or wilful misconduct. Industry, not the federal government or private insurance companies, must be responsible for paying
punitive damage awards. Using a punitive damage award fund to pay for latent injuries that develop over the long term will eliminate suits brought for short term gain by persons injured soon after an accident, and will create a source of payment for damages arising years after an accident. The increased costs to ratepayers created by a punitive damage provision would reflect more accurately the cost of the power that they receive. The similar effect on utility stockholders would encourage discussion on the viability of nuclear power. Having these costs borne by the people benefiting from the power is an important step in broadening the number of factors used to decide whether to invest in nuclear power.