

## **Cato Institute Policy Analysis No. 36: The Price-Anderson Act: Is It Consistent with a Sound Energy Policy?**

April 17, 1984

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### **Executive Summary**

Of all the seemingly endless debates in American society, certainly one of the most needless has been the debate over the safety and economic viability of nuclear energy. Citing statistics and using arguments that range from sophisticated sophistry to incredible idiocy, a vast army of politicians, intellectuals, academics, and lobbying groups has been debating this issue for almost three decades. In all, the debate has been an excellent example of Thomas Sowell's point that sometimes the only ultimate validation of an idea is if it sounds plausible enough to people or to the right People.[1]

While the debate goes on, usually centered on the role of government, few individuals seem to realize that nuclear power might not exist in the absence of government intervention. The conservative, usually in favor of more nuclear power, generally sees the problem as a surfeit of regulation.[2] The liberal, generally opposed to nuclear power, sees the problem as one of too little governmental regulation of this dangerous power source and reacts with such suggestions as Ralph Nader's proposal to hire one million government guards for nuclear power plants.[3]

There are many forms of government subsidization of the nuclear power industry. These subsidies include the sponsorship of research, enrichment of fuels, and disposal of nuclear wastes. Through payments by the nuclear utilities into a trust fund, the government is to take possession of all used fuel by 1998.[4] In spite of its free-market rhetoric, the Reagan administration has favored extending financial backing to the nuclear industry, including the Clinch River Breeder Reactor. As Richard Holwill of the Heritage Foundation writes, the Reagan administration "gives the appearance of being for a free market in all things conventional, but virtually socialist on nuclear power." [5]

These subsidies do not necessarily establish the nonviability of the nuclear power industry, in that it is conceivable that these functions could be taken over by private industry. However, the one government-furnished privilege that the nuclear industry could find it hardest to live without is the Price-Anderson Act's limitation on a nuclear power plant's liability in case of an accident.

### **The Price-Anderson Act -- A History**

Until 1954 it was the policy of the federal government that only the government should be involved in the development of nuclear power. The passage of the Atomic Energy Act of 1954 created the Atomic Energy Commission (AEC) and allowed for the licensing and operating of nuclear power plants for commercial purposes.[6] Apparently not considered by Congress in 1954, or for that matter by the industry, was the effect that unlimited liability would have on the ability

of the industry to raise money from investors or on the potential of suppliers to enter the industry. However, this issue soon surfaced.[7] By 1957, it was apparent that nuclear power would not exist without some limitation on liability, and Congress passed the Price-Anderson Act (actually an amendment to the 1954 Atomic Energy Act).

Consider the following statements from the 1956 and 1957 hearings on the then-proposed Price-Anderson amendment. A vice president of Westinghouse, Charles Weaver, stated: "Obviously we cannot risk the financial stability of our company for a relatively small project no matter how important it is to the country's reactor development effort, if it could result in a major liability in relation to our assets." [8]

In further testimony Weaver indicated that even Westinghouse's suppliers were unwilling to go ahead with the contract unless Westinghouse agreed to indemnify them against risks.[9] General Electric also indicated during the hearings that it was prepared to halt its work in the nuclear industry should a limitation on liability not be passed.[10] Suppliers of reactor shields also indicated their unwillingness "to undertake contracts in this field without being relieved of uninsurable liability in some way." [11]

It was under this pressure that the Price-Anderson Act was enacted. Under the act the maximum liability for any facility licensed by the AEC was fixed at the amount of liability insurance available from private sources.[12] For any damages from an accident above that, the AEC agreed to "indemnify and hold harmless the licensee and other persons indemnified . . . from public liability . . . which is in excess of the amount of insurance." [13] Aggregate liability was fixed at \$500 million plus the amount of private insurance.[14] Because the total amount of private liability insurance available in 1957 was \$60 million, aggregate liability was set at \$560 million. This total was to include "the reasonable costs of investigating and settling claims and defending suits for damages." [15] The government's chosen liability of \$500 million was a purely arbitrary number; one rationale advanced for it was that a claim would not seriously distort the government's budget.[16]

The original expiration date of the Price-Anderson Act was August 1, 1967. The rationale behind establishing a 10-year lifespan for the act was the hope that sufficient experience would accumulate in that period to allow the amount of commercial liability insurance to be large enough to make the act unnecessary.[17] By 1965, however, private liability insurance had not increased by even a single dollar. In that year the Act was extended until 1977, and the only significant change made was that aggregate liability was capped at \$560 million.[18] Thus, as the amount of private liability insurance would increase, the government's liability would diminish.

In 1966 the act was amended to provide for a waiver of defense by those indemnified.[19] Under the original version of the act, liability would have been governed under state laws. The waiver of defense, in effect, provided a federal rule of strict liability. In addition the act provided that the waiver of defense was to apply only to "extraordinary nuclear occurrences" as determined by the AEC.[20] An "extraordinary nuclear occurrence" was defined as "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 Commission determines to be substantial." [21]

With private liability insurance having grown to only \$125 million by 1975, and the nuclear industry having warned that, to provide sufficient planning time, the act must be extended well before its expiration date, the act was extended in 1975 until August 1, 1987.[22] The chief changes were to phase out the government indemnity and to allow the liability ceiling of \$560 million to grow.[23] These changes were to be accomplished by the imposition of a retrospective premium levied on each power plant of \$5 million in case of an accident.[24] Thus, at the end of 1982, with 80 reactors subject to the retrospective premium and private liability insurance set at \$160 million, aggregate liability was still at \$560 million but the government's indemnity was eliminated.[25] Currently there are 82 reactors and aggregate liability stands at \$570 million -- a figure that will grow as the number of reactors increases.

In 1978 the U.S. Supreme Court overturned a lower court ruling that the Price-Anderson Act was unconstitutional. There were two grounds on which the act was challenged in *Duke Power v. Carolina Environmental Study Group, Inc.* [26] One was that the act violated the Fifth Amendment to the U.S. Constitution in that it failed to ensure adequate compensation for victims of an accident. The other was that it violated the Fourteenth Amendment by treating nuclear accidents differently from other accidents.[27] In a seeming confirmation of Charles Black's thesis that rather than

acting as a check on the other branches of government, the Supreme Court tends to legitimize increases in government power,[28] the Court ruled that the act did not violate the equal protection provision of the Constitution in that the importance of nuclear power must be balanced against the burden of those potentially harmed.

Currently the Reagan administration has taken no position on extending the act beyond August 1, 1987. However, in December 1983, the nuclear Regulatory Commission (NRC) -- the successor agency to the AEC -- submitted its report to Congress "on the need for continuation or modification of the Act." [29]

The NRC report contains some recommendations that, if accepted by Congress, would weaken the protection provided by Price-Anderson, but without providing for full liability. The report contains a proposal to substitute for the liability ceiling an expanded system of retrospective premiums.[30] The retrospective premium would be increased to \$10 million and made chargeable for as many years as it takes to meet claims. (This proposal is discussed later in this paper.)

Given the Reagan administration's position on nuclear power, a recommendation to let the act expire would be somewhat of a surprise. According to the NRC, the last official statement on the act prior to the NRC report was by Deputy Secretary of Energy Kenneth Davis. Testifying before the House of Representatives on September 15, 1981, Davis admitted that "continued Price-Anderson indemnification authority is essential to attract and retain the highly-qualified contractors engaged in the Department's nuclear technology and national defense programs." [31]

### **Scarcity and Profits**

Perhaps the most common fallacy in public policy arguments is the simple failure to understand that we live in a world of pervasive scarcity. The concept of scarcity is quite simple: To obtain more of an item, something must be sacrificed. This is as true of energy as it is of any other scarce good. What is being sacrificed is the increased production of other goods and services that now must be foregone to obtain more nuclear energy. Since the Price-Anderson Act was originally passed, over \$150 billion has been spent on the construction of nuclear power plants -- \$150 billion that could have been spent on other activities, including other energy alternatives.[32]

Of all the arguments of nuclear power advocates, the one that is most irrelevant is that nuclear power generates vital electricity and thus deserves to be supported through Price-Anderson and other means. That nuclear power generates electricity proves nothing, just as the fact that horse manure, windmills, and charcoal can generate power does not prove that they should be subsidized.

Usually the advocates of the "vital power" thesis center their arguments on a fear of running out of energy. During the 1975 renewal hearings, Rep. John Young (D-Tex.) made the following less-than-prescient remarks in supporting extension of the Price-Anderson Act: "The fact is that we have run out of oil and gas. What oil and gas is left is desperately needed in a thousand other ways (other than boilers). The quicker that we can get into this other business of supplementary energy sources, the quicker this nation will be on its way to stability of its economy..." [33]

One of the great strengths of the market system is that it does not require reliance on people such as Rep. Young to forecast the future and to coordinate economic activity. Indeed, the information needed to coordinate a market is not, cannot, and need not be in the hands of any single individual. When an energy source such as oil becomes scarcer, the market mechanism working through prices and profits ensures that there is no disruption in energy supplies. If the price mechanism is left unfettered, no shortages can occur; at the same time the profit motive ensures that there are adequate long-term supplies. Nobel laureate Friedrich Hayek describes how the market process works when a resource (tin) becomes scarcer:

All that the users of tin need to know is that some of the tin they used to consume is now more profitably employed elsewhere and that, in consequence, they must economize tin. There is no need for the great majority of them even to know where the more urgent need has arisen, or in favor of what other needs they ought to husband the supply. If only some of them know directly of the new demand, and switch resources over to it, and if the new people who are aware of the new gap thus created in turn fill it from still other sources, the effect will spread rapidly throughout the whole economic system and influence not only all the users of tin but also those of its substitutes and the substitutes of these substitutes, the supply of all things made of tin, and their substitutes, and so on... [34]

Frank Zarb, then administrator of the Federal Energy Administration, assured us during the 1975 renewal hearings that the renewal of Price-Anderson was necessary "to help provide the benefits of lower cost nuclear energy to the consumer."<sup>[35]</sup> No interference is needed with the market mechanism to ensure what Mr. Zarb desired. Motivated by profits, entrepreneurs are continually seeking out less costly means of producing energy. The earning of entrepreneurial profit is possible when there is a divergence between where a resource is being used and where it could be used to better satisfy the most urgent needs of consumers and society. Thus if nuclear energy were desirable from the standpoint of the most urgent needs of consumers, there would be no need for governmental policies to encourage its use.

On the other hand a project is unprofitable only if the consuming public could realize more satisfaction from the production and consumption of another project. Hence, a major result of government subsidization of any industry is that resources are diverted from the area of their highest-valued use. This diversion occurs because subsidization makes an industry appear to be more profitable than it actually is. This results in resources flowing out of areas where they should be (as judged by the market signals of prices and profits) and into areas where they should not be. When a firm cannot operate at a profit in the free market, the result is a transfer of resources from higher-valued to lower-valued uses; therefore subsidization of nuclear energy is compounding the problem of scarcity.

Some advocates of Price-Anderson argue that because the government indemnity has never been used and indeed has now been eliminated, Price-Anderson is not a subsidy.<sup>[36]</sup> However, the above discussion makes it clear that Price-Anderson allows utilities to commit less capital to insuring nuclear plants, so the act results in a reallocation of resources away from more highly valued uses -- and thus it is indeed a subsidy. Where the market would allocate resources in the absence of Price-Anderson is impossible to predict, of course. Suffice it to say that resource allocation would be different. Perhaps the elimination of Price-Anderson would transfer resources to other forms of energy, but in any case resources would be allocated in a more efficient manner.

Stripped of all their sophistry, the advocates of subsidies for nuclear power have different valuations of the most urgently needed energy projects than does the market as a whole. Such government actions as the Price-Anderson Act can be seen as attempts to use the political process to impose these different preferences on other people. Government subsidization, therefore, must necessarily benefit some people at the expense of others because subsidization involves the reallocation of resources and because government generally raises its revenues by coercion.

Only through voluntary exchange are all parties in a transaction made better off without any one party being harmed.

Those who seek to gain through the political process quite rationally try to hide their own interests. Thus, the first section of the Price-Anderson Act states that the act "is in the interest of the general welfare and the common defense and security" of the United States and is needed "in order to protect the public."<sup>[37]</sup> Any cursory reading of the congressional testimony in support of the act and its two renewals would indicate, however, that the term "general welfare" would be more appropriately replaced by the phrase "welfare of the utilities, suppliers, architects, labor unions, and contractors to the nuclear industry." After all, Babcock and Wilcox, the Bechtel Corporation, General Electric, the AFL-CIO Building and Construction Trades Department, the International Brotherhood of Electrical Workers, and the National Constructors Association all united in their support of the Price-Anderson Act.<sup>[38]</sup> Furthermore, as John Long points out, the utilities can be considered an "amorphous" group whose members might include stockholders, customers, creditors, and employees of the utilities.<sup>[39]</sup>

### **Protecting the Public -- The Role of Insurance**

Despite continuing claims concerning the safety of nuclear power, the amount of private liability insurance available has actually declined in real terms since 1957, as demonstrated in the table on page 9. Compared with the \$160 million actually available, \$201 million would be needed to have the 1957 amount of \$60 million keep pace with inflation.<sup>[40]</sup> Furthermore, there is still only \$570 million of aggregate liability compared with the almost \$2 billion that would be needed to restore the purchasing power of the \$560 million available in 1957. All of this hardly represents, as the president of one of the nuclear liability insurance pools claimed recently, "continuing confidence in the nuclear industry."<sup>[41]</sup>

Commercial liability insurance for the nuclear industry is provided by two insurance pools. They are the American Nuclear Insurers (ANI), consisting of 140 stock insurers, and the Mutual Atomic Energy Reinsurance Pool (MAERP), consisting of 121 mutual insurers.[42] Both the ANI and the MAERP crossreinsure each other on the basis of their respective liability capacities; approximately 60 percent of nuclear liability insurance is currently reinsured.[43] Both pools prohibit members from writing policies for their own account (none are inclined to do so), so as to prevent adverse selection. That is, without mandatory pooling, lack of coverage or less capacity and extremely high rates would be the norm. All premiums and losses are divided on a proportional basis.

Property insurance for the nuclear industry is provided by the ANI and also by Nuclear Mutual Ltd. (NML), a Bermuda-based company. As of April 1983, the ANI offered \$568 million in total property coverage, while NML offered \$915 million in total property coverage.[44] The fact that available property insurance is substantially greater than available liability insurance does not mean that available liability could easily be increased in the absence of Price-Anderson. The pools cannot arbitrarily allocate capacity but "can merely marshal what underwriters in the private market are willing to supply on the basis of their own individual assessments of the risks in relation to the financial returns expected." [45]

Currently the average utility pays a premium of \$414,600 per year for liability insurance for a nuclear power plant (see table 1). In 1974 Herbert Denenberg, then the insurance commissioner of Pennsylvania, calculated that U.S. nuclear power plants would have to pay a premium of \$23.5 million for liability insurance without the protection of Price-Anderson.[46] Adjusted for inflation, that cost grows to \$46.6 million in 1983 dollars. The amount of liability insurance available from the insurance companies cannot be calculated by any standard formula, but some of the factors that enter the decision are the perceived risk of the insured activity; the insurance company's assets, surplus, and potential premium; and other activities insured by the company.[47] In any case the amount of available liability insurance represents only a small fraction of the potential losses in case of an accident. The most widely quoted study, the AEC-sponsored Rasmussen Report, estimated the average consequence of the worst-case reactor meltdown to 3,300 immediate deaths, 45,000 radiation injuries, 45,000 delayed cancers, 240,000 delayed thyroid problems, and property damages of \$14 billion.[48] The report has been widely criticized for its method of calculating accident probabilities, its failure to assess all possible accident causes, and the fact that staffers were subjected to bureaucratic pressures.[49] Critics of the report have estimated that potential damages could be as high as \$280 billion.[50]

Although the financial markets might not require nuclear power to be insured for the worst case, the current liability insurance of \$160 million is only a small fraction of the possible losses. According to the recent NRC report, "Neither risk managers of nuclear utilities nor insurers know with reasonable certainty the probability of occurrence of a catastrophic nuclear incident. For this reason, they cannot be unconcerned about such an eventuality." [51] Indeed, in the airline industry, many airlines carry liability insurance to cover the worst-case scenario.[52]

**Table 1**

**Nuclear Plants and Liability Insurance**

Year	Liability Ins. Plants With Operating Licenses	Liability Ins. Available (Millions of \$)	in Real Dollars (1957=100) (Millions of \$)	Avg. Premium Per Plant**
1957	1	60	60.00	195,000
1958	1	60	59.58	195,000
1959	2	60	59.11	195,000
1960	3	60	58.16	195,000
1961	3	60	57.58	195,000
1962	10	60	56.92	195,000

1963	11	60	56.23	195,000
1964	12	60	55.50	195,000
1965	12	60	54.59	195,000
1966	14	74	65.43	210,000
1967	14	74	63.63	210,000
1968	12	74	61.07	210,000
1969	16	82	64.21	220,000
1970	20	82	60.63	220,000
1971	25	82	58.13	220,000
1972	30	95	65.20	235,000
1973	42	95	61.37	235,000
1974	55	110	64.04	255,000
1975	58	125	66.68	270,000
1976	62*	125	63.04	270,000
1977	66*	140	66.32	346,000
1978	69*	140	61.61	346,000
1979	69*	160	63.28	346,000
1980	72*	160	55.57	346,100
1981	75*	160	50.50	376,025
1982	80*	160	47.59	396,725
1983	82*	160	N/A	414,600

Sources: Nuclear Insurance: Facts & Figures, American Nuclear Insurers, Report 1 (revised March 1983). Historical Profile of U. S. Nuclear Power Development, Atomic Industrial Forum (January 1, 1983). Liability underwriting department, American Nuclear Insurers.

\*Reflects number of plants subject to retrospective premium. In 1975 the Price-Anderson Act was amended to provide for retrospective premium of \$5 million. As some plants jointly operated by Department of Energy are not subject to retrospective premium, number of plants with operating licenses slightly exceeds number in retrospective pool (by three in 1982, for example).

\*\*Estimates by liability underwriting department, American Nuclear Insurers.

However, all estimates of potential damages and odds of an accident occurring are beside the point. As Harold Green put it succinctly, the single best estimate of the level of risk "which our society regards as acceptable" is the "availability of insurance coverage and the willingness of insurance companies to provide it at feasible rates." [53]

In a free market, premiums tend to settle toward an actuarially fair premium (the odds of an accident occurring as calculated by the insurance company, multiplied by the possible damages in an accident, plus a normal rate of return). If all insurance companies are miscalculating the uncertainty associated with nuclear energy, one would expect other firms to enter the industry in search of entrepreneurial profits. Therefore, the free market is perfectly capable of determining the safety of nuclear energy.

Perhaps pronuclear forces would argue that nuclear power plants cannot be fully insured, not because they are unsafe but because the precise odds of an accident occurring cannot be worked out in that they are so new. [54] This objection displays a lack of understanding about the nature of insurance in a free market. It is precisely the availability of information or the absence of it that must be taken into account when an insurance company sets its premiums or

decides whether to insure a particular activity.

State Farm Fire and Casualty Company admitted as much when it responded to a potential consumer as to why it did not insure against the peril of nuclear radiation:

Insurance is based upon the relative predictabilities of an accident occurring and the charging of a rate for several similar or homogeneous risks. The predictability of each of these accidents is based upon previous experience for this same type of risk and the theory of large numbers. Thus a large number of similar risks will over a period of time develop a predictable number of accidents. If, however, the experience of the accident is not known, then neither the predictability nor the severity of the accident can be used to develop an adequate rate. The two extremes of this situation being that the insurance carrier could charge a premium equal to the cost of the risk insured (thus making the cost prohibitively expensive), or charge such a low rate that the Company would not have sufficient funds to pay its claims in case of a catastrophe. In the case of providing coverage for the peril of nuclear radiation, such a situation exists. Since no experience exists in providing such coverage, and there is a definite possibility for a catastrophe occurring, insurance companies are not capable of making the actuarial decisions to provide this coverage.[55]

The problem described above, which is the absence of loss experience (thereby making measurement of the risk involved difficult), also applies to nuclear liability insurance. The possibility of a nuclear accident is an uncertain question, rather than one that can be reduced to risk through probability statements.

Risk, according to Frank Knight, "occurs when an event is a member of a class of a large number of homogeneous events and there is a fairly certain knowledge of the frequency of occurrence of this class of events." [56] Thus, a firm producing toasters may establish from experience that a certain percentage of them may break down. This type of homogeneous event can be easily pooled. True uncertainties, on the other hand, are more difficult to insure. They are unique cases that may bear a resemblance to one another but that still retain important differences. An event is uncertain when it is known that there are factors that will influence the outcome but nothing is known about those factors. Certainly the operation of a nuclear power plant is such an uncertain event.

According to the recent NRC report, the "absence of adequate information about the probability of the frequency and severity of insured losses" prevents the insurance pools from "using conventional actuarial techniques to establish a price for the insurance. The absence, moreover, of a large base of homogeneous exposures renders the pricing process tenuous." [57]

Thus, premiums for nuclear liability insurance are set more by entrepreneurial judgment than by insurance industry principles. This would suggest that nuclear liability insurance could not grow substantially within the confines of the traditional insurance industry.

One advantage of relying on the market to decide the safety of nuclear energy -- by means of growth or lack of growth of liability insurance -- is that it will spare us the ceaseless rhetoric that accompanies any nonmarket decision. During the 1975 Price-Anderson Act renewal hearings, for example, Ralph Nader responded to a question from Senator Joseph Montoya (D-N.M.) about what else he would recommend, besides the repeal of the Price-Anderson Act, to insure nuclear safety. Nader suggested "more government inspectors. . . . About 1 million guards and backup personnel would be needed within two decades to make sure that sabotage and theft and all the rest of it are not possible." [58] When the senator asked him who would pay for it and how much it would cost, Nader replied the taxpayer and several billion dollars, but argued ludicrously that such expenditures would be a major source of economic growth. [59]

### **The Repeal of Price-Anderson**

If the Price-Anderson Act is not renewed and if Congress does not pass explicit legislation on the issue, a legal battle is likely to occur over the status of the currently operating nuclear power plants. The language of the Price-Anderson Act makes it unclear if these plants are to be protected for their operating life under the provisions of the act or if their liability insulation is to expire with the act August 1, 1987. The NRC's expectation is that the plants will be grandfathered in, even if the law is not explicit. [60]

While the status of currently operating plants may be unclear if Price-Anderson is repealed, there is much less

uncertainty about any new plants being built. None are likely to be proposed for the foreseeable future.[61]

Some people have argued that the nuclear industry, being a mature industry, would survive the loss of Price-Anderson. Although the false bravado of the utilities and their suppliers is easy to dismiss, other, more independent sources -- such as a report prepared at Columbia University -- have taken a similar position.[62]

With Price-Anderson, it is currently expected that the amount of liability insurance could grow to \$200 million by 1985.[63] The NRC report states it is unlikely that the amount of available liability insurance would increase much past the \$200 million level "without strong pressure from outside the insurance industry." [64] The obvious question is, what could be expected with the repeal of Price-Anderson? One could indeed argue, as Richard Holwill does, that "the more likely result" is that sufficient insurance would be provided to maintain the viability of the industry.[65] Although it is true that utilities now have no incentive to press for an increase in available liability insurance, it is by no means certain that this increase in demand would be sufficient to offset possible suppside effects.

There are several reasons suppliers could wish to reduce liability insurance should Price-Anderson be repealed. At present, for example, the proportion of foreign participation in the liability pools is 49 percent.[66] According to the insurance pools, removing the limit of liability would cause foreign reinsurers to react adversely and reduce their participation.[67]

Another reason is that the Price-Anderson Act reduces demand for property and liability insurance against nuclear hazards by two major groups: suppliers of goods and services to the nuclear industry and homeowners and businesses within the vicinity of nuclear plants. Coverage against damage from accidents at nuclear power plants is now excluded from property insurance policies. Without the limited protection of Price-Anderson and the implied commitment of Congress to provide funds in case of an accident, demand on the part of property owners would increase. Suppliers who are currently indemnified under Price-Anderson either would demand liability coverage or possibly leave the industry entirely. These increases in demand would serve to reduce capacity available to liability insurance.

On the other hand, utilities needing more liability insurance would have an incentive to accept stricter safety standards from the insurance companies. The issuance of stricter standards, in keeping with a traditional role of the insurance industry, could result in higher costs and thus further decrease the viability of the industry. In addition, private testing firms, modeled after such firms as Underwriters Laboratory, could conceivably arise in the market to help ensure safety in the nuclear industry. An increase in the role of the insurance industry would be a welcome development, in that insurance industry "regulators" have an economic incentive to develop safe but cost-efficient operating procedures.

The issue of available capacity in the insurance industry is important. Satellites launched by the space shuttle are now required by the National Aeronautics and Space Administration (NASA) to carry \$500 million each in liability insurance.[68] The space shuttle Challenger launched three satellites in June 1983, but worldwide insurance markets had enough capacity (\$1 billion) to insure only two of the satellites.[69] This sum -- \$1 billion -- is also a capacity barrier in at least one instance: California is required by the financial markets to have approximately \$1 billion in insurance for its eight toll bridges, but the state runs into persistent capacity problems in obtaining that coverage.[70] However, \$1 billion is certainly not an absolute capacity barrier; for example, firms can buy \$1.35 billion in property insurance for risks associated with oil and gas.[71] The above discussion simply suggests that nuclear liability insurance could not grow without bounds.

In at least one other industry, available liability insurance exceeds that of the nuclear industry. Liability insurance coverage of \$500 million per flight is not uncommon in the airline industry.[72] While no firm conclusions should be drawn from this figure, the fact that insurers will insure the airline industry, where accidents are not uncommon, for a greater amount than the nuclear industry is indicative of the insurers' perception of the risks involved. Furthermore, a hotel can purchase over \$200 million in coverage, while coal mine operators demand and can purchase up to \$60 million in coverage per mine. [73].

Even with the liability ceiling of Price-Anderson, the investment community has become concerned about the amount of property insurance available. Although available property insurance has risen to \$568 million, the vice president of Standard and Poor's electric utilities rating group recently warned that the available insurance would not be adequate to

cover losses in the event of a shutdown and thus could be a "prescription for insolvency." [74]

Without the liability ceiling, it is conceivable that the utility seeking to borrow funds in the bond market could not obtain financing at a reasonable cost or perhaps at all. This is because securities rating agencies would consider the removal of the liability limit to be a significant rating factor. Furthermore, under existing Securities and Exchange Commission rules, the absence of a liability ceiling would have to be disclosed to investors. [75]

Even without any government-forced disclosures, it is clear that the cost of capital to the utility would increase. If investors feel there is a significant possibility of a loss of capital or dividends, their perceived risk increases and thus the required return on their purchased stocks and bonds increases. Therefore, if sufficient insurance were not available for purchase at a reasonable price, the nuclear power industry would be in jeopardy.

If Price-Anderson were allowed to expire, the determination of what sort of tort liability (strict liability or negligence) that nuclear plants would be subject to would revert to the states. Because nuclear power is potentially dangerous, almost all states would subject the utilities to strict liability. [76] Accordingly, a utility would be liable for damages in case of an accident, even if it had not behaved in a negligent manner. Further compounding the problem of operating nuclear power plants in the free market is the fact that suppliers to the nuclear industry have made it amply clear that they will not participate without either the protection of Price-Anderson or the issuance by the utilities of "hold harmless" clauses to the suppliers. The issuance of such clauses would further increase the liability of the utilities and further decrease the potential profitability of such plants. The issuance of such clauses would be contrary to standard risk-management procedures, which encourage the shifting of risk to suppliers. As no new plants have been ordered and 48 have been canceled since 1978, any increase in operating costs on the margin is bound to be devastating. [77] Owing to the cancellations, suppliers expect no new orders for nuclear power plants and may leave the industry regardless of whether Price-Anderson is continued. [78]

Some observers argue that the operators of nuclear power plants would simply pass on these increased costs. One author admits that if no liability insurance were to exist, a company would have to "set aside huge sums for contingency." [79] However, the same author argues that the contingency would have to be accepted as part of the rate base. [80] Nevertheless it is highly unlikely that the public service commissions would allow rates to increase when other, lower-cost alternatives are available. Furthermore, a utility that has to sell its stocks and bonds would not want to operate such higher-cost plants.

Although the retrospective premium portion of the nuclear indemnity is seemingly provided by the utilities, it also could not exist without government involvement. Most people would not buy automobile insurance under a plan where they were charged a certain amount any time anyone else had an accident; people who are a better-than-average accident risk would find such a policy a poor buy indeed. The pooling of risks is a problem any time the risks are not homogeneous. Thus, those utilities that operate safer-than-average plants would have no incentive to take part in a retrospective insurance scheme.

### **In Favor of a Free Market**

The unfortunate policy of socializing the risk in the nuclear industry is now being extended to other industries. For instance, the Comprehensive Environmental Response, Compensation and Liability Act, better known as the Superfund legislation, provides a limitation on liability for the release of toxic substances. [81] The Superfund bill also provides for a tax on the production of certain chemicals, with the money raised to be used in the cleanup. This provision is quite similar to the retrospective premium portion of the Price-Anderson Act.

Any limitation on liability will ultimately cause a misallocation of scarce resources. One could argue that with the expiration of Price-Anderson, a different set of economic incentives would come about that would allow the nuclear industry to exist,

albeit in a different form. For example, plants could locate further away from population centers, stricter operating procedures could be developed by the insurance companies, and suppliers could be induced financially by the utilities to build parts with lower rates of failure. These changes could increase costs past the point of economic viability. As discussed above, the crucial question is whether liability insurance will increase sufficiently to allow the industry to

continue -- and the outcome is by no means certain.

Several recent proposals have been advanced for modifying or eliminating the protection of Price-Anderson. Richard Holwill proposes that the act be phased out but that the "requisite level of insurance should be determined by local public utility commissions that are responsible to local voters and will, therefore, be sensitive to the cost of unrealistically high insurance requirements. [82]

The main problem with the Holwill proposal is that the "requisite" level of insurance is best determined by the financial markets and not by a political commission. Further, in a free market it is impossible for rates to be "unrealistically high," in that such rates would attract entry into the insurance industry and thereby drive down rates.

The NRC proposal to substitute limited annual payments for unlimited liability is also inconsistent with the free market. Under the NRC proposal, the occurrence of an accident that causes damages greater than the amount of available insurance would cause the retrospective premium to be paid by the utility for as many years as it takes to pay off the damages. [83] Such a proposal has at least one advantage over the current system: The financial markets would probably more closely examine the industry, taking into account the possibility of substantially higher costs in their ratings. However, the proposal simply compounds the problems of retrospective premiums. In addition, as the requisite level of insurance would still not be determined by the financial markets, the proposed revision in the Price-Anderson Act would still leave the act as a subsidy that misallocates resources to nuclear energy.

In short, whether the nuclear industry survives is best left to the free market to decide. Only a full repeal of the Price-Anderson Act will allow for the internalization of all costs. The sophistic view that the act protects the public must end. That the act's function is to protect the nuclear industry is beyond question. The public, though, is best protected by a free-market energy policy that guarantees that each resource is placed in its highest-valued use. Thus, the interest

of the energy consumer is best served by allowing the Price-Anderson Act to expire. Such government policies as subsidizing the nuclear and synthetic fuels industries and imposing price controls do promote energy problems. Relying on the free market will ensure that the current trend of falling energy prices -- which is the long-term historical trend -- will continue

## FOOTNOTES

[1] Thomas Sowell, *Knowledge and Decisions* (New York: Basic Books, 1980), p. 9.

[2] See for instance "Cloud over Nuclear Energy," *Barron's*, May 29, 1978. More recently, however, the Heritage Foundation has called for a "phasing out" of Price-Anderson; see Richard N. Holwill, "Department of Energy," in Holwill, ed., *Agenda 83* (Washington, DC: Heritage Foundation, 1983) p. 139.

[3] U.S. Congress, Joint Committee on Atomic Energy, *Possible Modification or Extension of the Price-Anderson Insurance and indemnity Act of 1957 in Order for Proper Planning of Nuclear Power Plants to Continue Without Delay*- Hearings before the Joint Committee on Atomic Energy on H.R. 8631, 94th Cong., 1st sess., 1975, p. 159.

[4] Act of January 7, 1983, Public Law 97-425, 96 Stat. 2201.

[5] Holwill, p. 143.

[6] Act of August 30, 1954, Ch. 1073, 68 Stat. 919.

[7] Legislative Drafting Research Fund of Columbia University, *Issues of Financial Protection in Nuclear Activities*; reprinted in *Selected Materials on Atomic Energy Indemnity and Insurance Legislation*, 93d Cong., 2d sess., 1974, p. 79.

[8] Joint Committee on Atomic Energy, *Governmental Indemnity for Private Licensees and AEC Contractors Against Reactor Hazards*-Hearings Before the Joint Committee on Atomic Energy, 84th Cong., 2d sess., 1956, p. 110.

[9] Ibid., p. 116.

[10] Joint Committee on Atomic Energy, Hearings Before the Joint Committee on Atomic Energy on Governmental Indemnity and Reactor Safety, 85th Cong., 1st sess., 1957, p. 148.

[11] Ibid., p. 285.

[12] Act of September 2, 1957, Public Law 85-256, section 4, 71 Stat. 576.

[13] Ibid. Under the act the AEC is to indemnify the utility, prime contractor, and any other person who might be liable. This could mean subcontractors of the licensee, including designers and suppliers of parts. The government's position is that any person is to be indemnified no matter what the contractual relationship; this would include, for example, an airline whose plane crashes into a reactor. See Joint Committee on Atomic Energy, Legislative History Atomic Energy Act of 1954 -- Amendment, S. Rept. 296.

[14] Public Law 85-256, section 4.

[15] Ibid.

[16] Legislative Drafting Research Fund of Columbia University, p. 81.

[17] Legislative History Atomic Energy Act of 1954 -- Amendment, p. 1811.

[18] Act of September 29, 1965, Public Law 89-210, 79 Stat. 855-57

[19] Act of October 13, 1966, Public Law 89-645, section 3, 80 Stat. 891.

[20] Ibid., section 1.

[21] Ibid. The 1979 incident at Three Mile Island was ruled to be an "extraordinary nuclear occurrence."

[22] Act of December 31, 1975, Public Law 94-197, 89 Stat 1111 .

[23] Ibid.

[24] Ibid., section 3. The original language called for a payment of between \$2 million and \$5 million. In 1977 the NRC ruled that the payment was to be \$5 million but declared its intention to pay defaulted retrospective premiums.

[25] Atomic Industrial Forum, Nuclear Power Facts and Figures (1983), p. 1.

[26] Duke power Co. v. Carolina Environmental Study Group, Inc., 438 U.S. 59 (1978).

[27] For a discussion see Berndt Ingo Brauer, "The Price-Anderson Act: A Constitutional Meltdown of Tort Liability," Hastings Constitutional Law Quarterly 8 (Winter 1981):382-95.

[28] Charles L. Black, Jr., The People and the Court (New York: Macmillan, 1960), pp. 32-33, 42-43, and 64-65.

[29] Public Law 94-197, section 14.

[30] Nuclear Regulatory Commission, Office of State Programs, The Price-Anderson Act -- The Third Decade, 1983, NUREG-0957, pp. I-1 and I-5.

[31] Davis made his statement before the Subcommittee on Energy Research and Production of the House Committee on Science and Technology.

[32] Unpublished estimate supplied by the Atomic Industrial Forum.

- [33] Hearings on H.R. 8631, p. 100.
- [34] Friedrich A. Hayek, "The Use of Knowledge in Society," *Individualism and Economic Order* (Chicago: Henry Regnery Company, 1972), pp. 85-86.
- [35] Hearings on H.R. 8631, p. 7.
- [36] Robert Wilson, "Nuclear Liability and the Price-Anderson Act," *The Forum* 12 (Winter 1977): 617.
- [37] Public Law 85-256, section 1.
- [38] Hearings on H.R. 8631.
- [39] "Price-Anderson Act Subsidizes More Than Utilities: Professor," *Business Insurance*, August 29, 1983, p. 12.
- [40] Calculations made using the consumer price index (Bureau of Labor Statistics).
- [41] "Insurance News," prepared for the American Nuclear Insurers, December 13, 1982.
- [42] For a further discussion of nuclear power liability insurance pools, see Charles Haugh, "Insurance Pools," in John D. Long and Davis W. Gregg, *Property and Liability Insurance Handbook* (Homewood, Ill.: Richard D. Irwin, Inc., 1965), pp. 969-77; and Nuclear Regulatory Commission, pp. B1-B17.
- [43] Information supplied by the liability underwriting department of the American Nuclear Insurers.
- [44] Rhonda Rundle, "Nuclear Mutual Can Withstand Disasters," *Business Insurance*, April 25, 1983, p. 1.
- [45] Alliance of American Insurers et al., *Nuclear Power, Safety and Insurance: Issues of the 1980's: The Insurance Industry's Viewpoint*, December 1979, p. 11.
- [46] Joint Committee on Atomic Energy, p. 494.
- [47] Legislative Drafting Research Fund of Columbia University, p. 111.
- [48] For a complete discussion, see Daniel Meek, "Nuclear Power and the Price-Anderson Act: Promotion over Public Protection," *Stanford Law Review* 30 (January 1978):430-46.
- [49] Deborah Shapley, "Reactor Safety: Independence of Rasmussen Study Doubted," *Science* 197 (July 1, 1977): 1529-30.
- [50] Meek, p. 431.
- [51] Nuclear Regulatory Commission, p. B-2.
- [52] James Burcke, "Aviation Exposures Climbing, Experts Say," *Business Insurance*, May 9, 1983, p. 18.
- [53] Harold Green, "Nuclear Power: Risk, Liability and Indemnity," *Michigan Law Review* 71 (January 1973): 506.
- [54] After almost three decades of operation, this argument wears thin.
- [55] Selected Materials on Atomic Energy Indemnity and Insurance Legislation, pp. 471-72.
- [56] Frank Knight, *Risk, Uncertainty and Profit*, 3d ed. (London: London School of Economics, 1940), p. 223.
- [57] Nuclear Regulatory Commission, p. B-14.

[58] Hearings on H.R. 8631, p. 159.

[59] Ibid.

[60] NRC opinion supplied by Robert Wood.

[61] Some plants still could open in that a permit to build generally becomes a license to operate.

[62] Legislative Drafting Research Fund of Columbia University, p. 126.

[63] Nuclear Regulatory Commission, p. I-7.

[64] Ibid.

[65] Holwill, p. 140.

[66] Information supplied by the liability underwriting department of the American Nuclear Insurers.

[67] Alliance of American Insurers et al., p. 15.

[68] Stacy Shapiro, "Capacity Still Falls Short of Shuttle's Requirement," *Business Insurance*, June 27, 1983, p. 1.

[69] Ibid.

[70] Rhonda Rundle, "Coming Up Short," *Business Insurance*, December 27, 1982, p. 1.

[71] Information supplied by Sedgwick Offshore Resources Ltd.

[72] Burcke, p. 18.

[73] "Product Liability Doesn't Cut Into Gillette's Profits," *Business Insurance*, January 8, 1982, p. 1. Coal mine information supplied by Flat Top Insurance Agency, Bluefield, West Virginia.

[74] "Insurance News," prepared for the American Nuclear Insurers, March 31, 1983.

[75] Nuclear Regulatory Commission, p. II-11.

[76] See Meek, p. 412; Legislative Drafting Research Fund of Columbia University, p. 99; and Dan Anderson, "The Price-Anderson Act: Detrimental to Energy Decisions and the Public Interest," in Hearings on H.R. 8631, p. 296.

[77] Fred Barbash and Milton Benjamin, "States Can Curb A-Plants," *Washington Post*, April 21, 1983, p. A8.

[78] Nuclear Regulatory Commission, p. C-11.

[79] Wilson, p. 619.

[80] Ibid. Also Duke Power argues that "failure to extend the Price-Anderson . . . would only add to the consumer's economic burden." Quoted in Anthony Early, "The Price-Anderson Act Under Attack," *Notre Dame Lawyer* 53 (June 1978): 960.

[81] Act of December 11, 1980, Public Law 95-510, 94 Stat. 2767.

[82] Holwill, p. 139.

[83] Nuclear Regulatory Commission, p. II-1 -- II-5.