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Price-Anderson Act: Nuclear Power Industry Liability Limits and Compensation to the Public After Radioactive Releases

Since the establishment of the nuclear power industry in the 1950s, the issue of how to handle nuclear accident liability has been regularly debated in Congress. From the beginning, it was argued that commercialization of nuclear energy would require liability limits for electric utilities and reactor suppliers. Congress responded in 1957 by passing the Price-Anderson Act, which added Section 170 of the Atomic Energy Act of 1954 (42 U.S.C. 2210). The law established accident liability limits for the nuclear industry and a mechanism to ensure that damage compensation would be readily available within those limits. The Price-Anderson liability system, despite many major amendments over the years, is still largely in place today.

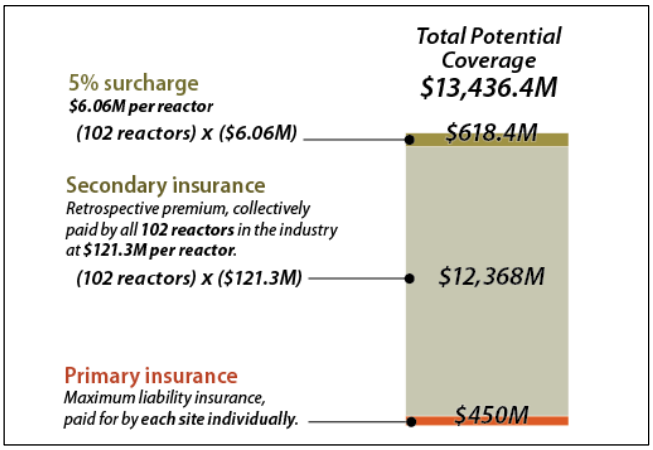
Critics of the Price-Anderson Act contend that its liability limits protect the nuclear power industry from paying the full cost of potential major accidents. Those critics view Price-Anderson as an unjustified subsidy for nuclear power that distorts energy markets. However, supporters of the Price-Anderson system contend that it provides an assured source of damage compensation that might not be available, or be paid as quickly, under the normal tort process.

Nuclear Power Accident Liability

The Price-Anderson Act authorizes the Nuclear Regulatory Commission (NRC), which issues licenses for building and operating nuclear reactors, to limit the liability of its reactor licensees for radioactive damages to members of the public. The liability limit is set at the maximum insurance available to the nuclear power industry, as described below. NRC indemnifies (protects) its reactor licensees against damage awards above that limit. Reactor licensees indemnified by NRC retain that coverage as long as they continue to operate, although the liability limits may increase over time. Price-Anderson's authority for NRC to indemnify additional reactors periodically expires and has been extended four times, most recently through 2025 by the Energy Policy Act of 2005 (P.L. 109-58). NRC's regulations for Price-Anderson are at 10 C.F.R. 140.

Under Price-Anderson, the owners of commercial reactors must assume all liability for nuclear damages awarded to the public by the court system, and they must waive most of their legal defenses following a nuclear incident that results in a severe radioactive release ("extraordinary nuclear occurrence"). To pay such damages, Price-Anderson established two layers of insurance for licensed reactors with at least 100 megawatts of electric generating capacity (all current U.S. commercial reactors). For the primary insurance layer, each licensed reactor must be covered by the maximum liability insurance commercially available, which was raised from $375 million to $450 million on January 1, 2017. The secondary layer is a nuclear industry self-insurance system. In the secondary layer, any damages from a nuclear incident exceeding the $450 million available under the primary layer are to be assessed equally against all 100-megawatt-and-above power reactors. These assessments, called "retrospective premiums," are currently capped at about $121.3 million per reactor.

Figure 1. Price-Anderson Insurance Layers
For damage to the public from nuclear incidents



Source: Created by CRS with information from NRC.
Note: Some figures are rounded.

Total damage payments available under the secondary insurance layer equal the maximum retrospective premium ($121.3 million) multiplied by the number of covered reactors. According to NRC, 102 commercial reactors, including three that are permanently closed, are currently covered by the retrospective premium requirement. (NRC can exempt shutdown reactors from the retrospective premiums after their spent fuel has sufficiently cooled.) For each nuclear incident, therefore, Price-Anderson's primary and secondary layers currently would provide up to $12.8 billion in public compensation. That total includes $121.3 million in retrospective premiums from each of the 102 currently covered reactors, totaling $12.4 billion, plus the $450 million in insurance coverage carried by the reactor that suffered the incident. On top of those payments, a 5% surcharge may also be imposed on the retrospective premiums, raising them to $127.3 million per reactor and the total available compensation to about $13.4 billion (see **Figure 1**). Under Price-Anderson, the nuclear industry's liability for an incident is capped at that amount, which varies over time depending on the number of covered reactors, the amount of available insurance, and an inflation adjustment. Payment of any damages above that liability limit would require congressional approval under special procedures in the act, which does not specify the source.

The retrospective premiums would be paid at an annual rate of no more than $19.0 million per reactor, to limit the potential financial burden on reactor owners following a major accident (and also potentially slowing damage payments to the public). With 102 covered reactors, total annual retrospective premium payments would be capped at about $1.9 billion. The caps on total and annual retrospective premiums are adjusted for inflation every five years.

Since Price-Anderson was enacted, no nuclear incidents have caused damage to the public above the primary layer of insurance. The 1979 partial meltdown of the Three Mile Island 2 reactor in Pennsylvania resulted in the largest number of claims, with damage payments totaling about $151 million, according to the National Association of Insurance Commissioners. Dozens of other commercial reactor incidents over the years have resulted in far smaller payments.

Small Modular Reactors

Price-Anderson specifies that a nuclear plant consisting of multiple small modular reactors (SMRs) would be considered a single reactor in determining its retrospective premiums (although no such plants have yet been built). The electric generating capacity of the entire plant must be no more than 1,300 megawatts, and each SMR must have a capacity of 100-300 megawatts. Therefore, in the event of a severe release, a power plant with six 120-megawatt SMRs would be liable for retrospective premiums of up to $121.3 million (the amount for a single large reactor), rather than $727.8 million (the amount for six large reactors, excluding the 5% surcharge).

The first, and so far only, SMR design to be submitted for NRC certification was from NuScale Power on December 31, 2016. The NuScale design would consist of up to 12 reactors of 50 megawatts (electric), all immersed in a single pool of water. Because the NuScale SMRs are below 100 megawatts of electrical generating capacity, they are subject only to the primary layer of liability insurance. Under NRC regulations, the primary layer for a reactor from 10-100 megawatts would be set by a formula that includes reactor capacity and local population density but would be no more than $74 million. One liability insurance policy of up to $74 million would cover all 12 reactors at a single NuScale plant. Total liability for reactors under 100 megawatts (electric) is limited to $560 million. The federal government would pay for any damages to the public above the required liability insurance coverage, up to the $560 million limit (Atomic Energy Act §170 b. and c.). NRC has been studying whether higher coverage should be required.

DOE Nuclear Contractors

The Price-Anderson Act also covers contractors who operate Department of Energy (DOE) nuclear facilities. P.L. 109-58 set the liability limit on DOE contractors at $10 billion per incident within the United States, to be adjusted for inflation every five years. The most recent inflation adjustment, in 2013, increased the limit to $12.7 billion.

Price-Anderson authorizes DOE to indemnify its contractors for the entire amount of their liability, so that damage payments for nuclear incidents at DOE facilities would ultimately be paid by the federal government. However, the law also allows DOE to issue penalties on its contractors for safety violations, and contractor employees and directors can face criminal penalties for "knowingly and willfully" violating nuclear safety rules. For nonprofit contractors, civil penalties imposed for violating safety rules are limited to the amount of management fees paid under that contract.

Continued Need and Adequacy

The Price-Anderson Act's limits on liability were crucial in establishing the commercial nuclear power industry in the 1950s. The nuclear power industry still considers them to be a prerequisite for any future U.S. reactor construction. Supporters of the Price-Anderson system contend that it has worked well in ensuring that nuclear accident victims have a secure source of compensation, at little cost to the taxpayer. Opponents contend that Price-Anderson inappropriately subsidizes the nuclear power industry by reducing its insurance costs and protecting it from some of the financial consequences of the most severe conceivable accidents. For example, the 2011 Fukushima disaster involved simultaneous radioactive releases from three reactors and required financial intervention by the Japanese government. Damages to the public are expected to reach at least $57 billion, according to media reports. A similar U.S. nuclear incident involving three reactors at a single site would have a liability limit of $41.66 billion ($450 million for the primary layer and $13.44 billion in the secondary layer for each of the three reactors). Any compensation above that amount would be determined by Congress.

International Liability Agreement

The U.S. government is party to an international liability system that, among other purposes, covers U.S. nuclear equipment suppliers conducting foreign business. The Convention on Supplementary Compensation for Nuclear Damage (CSC) entered into force April 15, 2015, after being ratified by five countries with a total of 400,000 megawatts of thermal nuclear power capacity (about 133,000 megawatts of electric generating capacity).

CSC implementing language for the United States was included in the Energy Independence and Security Act of 2007 (P.L. 110-140, Section 934). That provision specifies that the CSC does not change the liability and payment levels already established by the Price-Anderson Act. Each party to the convention is required to establish a nuclear damage compensation system within its borders analogous to Price-Anderson. For any damages not covered by those national compensation systems, the convention establishes a supplemental tier of damage compensation to be paid by all parties. P.L. 110-140 requires the U.S. contribution to the supplemental tier to be paid by suppliers of nuclear equipment and services, under a formula to be developed by DOE. Supporters of the convention contend that it will help U.S. exporters of nuclear technology by establishing a predictable international liability system.

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