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R SHEET ON

PRICE-ANDERSON

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BACKGROUND

As nuclear science expanded in the decade following its military use in World War II, commercial pressures to develop civilian uses for nuclear power created the need for a functioning insurance market that would agree to underwrite the industry's liability for nuclear accidents. Nuclear energy has an excellent safety record, but because the potential damage from a meltdown is so high, insuring nuclear plants proved challenging for the private market.

In 1957, Congress attempted to resolve this impasse by enacting the Price-Anderson Nuclear Industries Indemnity Act ("Price Anderson"). Price Anderson capped liability for nuclear accidents beyond a certain amount (currently $13.9 billion). Damages below this cap are assessed in one of two ways. First, for damages below a certain threshold (currently $450 million), individual plants must purchase insurance from a private insurance pool called the American Nuclear Insurers (ANI) to cover their liability. Second, if there is an incident with damages above the threshold and below the cap, each plant agrees to pay a quota share of the damage into a pool that is used to pay out the damages. Price-Anderson has been reauthorized or extended six times, most recently in 2005, and will expire again in 2025.

CURRENT DEBATE

Currently, almost all U.S nuclear power comes from reactors built between 1965 and 1990. As of October 2019, there were 65 pressurized water reactors (PWRs) and 33 boiling water reactors (BWR), with a combined capacity of 99.2 gigawatts (GW). Essentially, all of these use what the industry calls "Generation II" technology, which was developed in the 1960s. Often known as light-water reactors (LWR), these use an active safety feature that involves electrical or mechanical operations that must be manned

SUMMARY

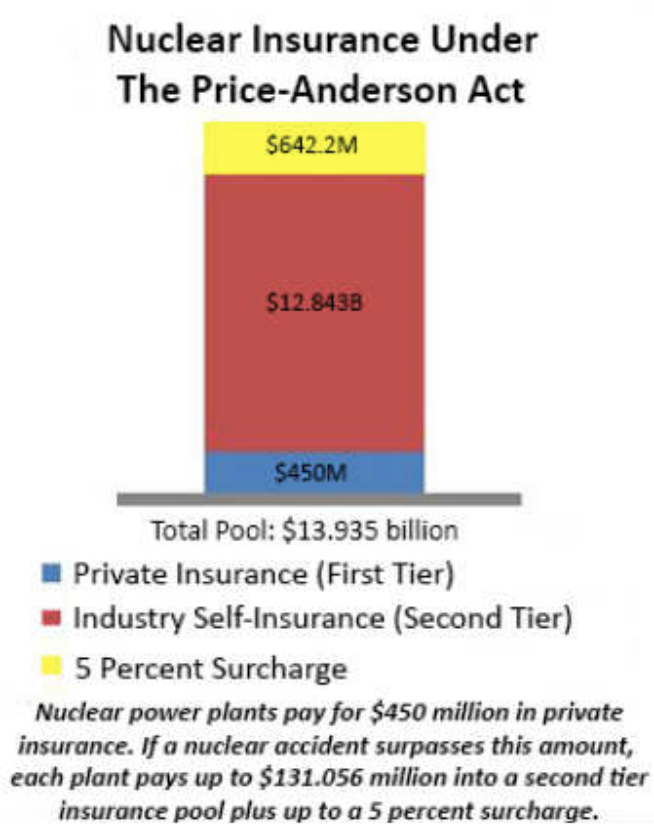
- Price-Anderson caps liability for nuclear accidents, with damages below 13.9 billion split between different plants.
- New reactor designs are trending to smaller reactors with safety features that can preclude meltdowns, and thus offer a more favorable risk profile.
- Laws that govern insurance of nuclear plants should develop to take account of these technological changes.

24 hours a day by operators, and does not have fully automated "passive" safety features. Accordingly, the economics of Gen II light-water reactors involve very high capital costs and large amounts of redundancy and manpower to ensure safety from a reactor meltdown.

To minimize these costs, emerging reactor designs tended toward smaller and safer. For example, small modular reactor (SMR) designs have features that make the reactor essentially meltdown proof, by taking advantage of the reactor core's small size. A smaller core leads to a greater surface area-to-volume ratio, which allows natural processes to cool it indefinitely in the case of a complete power blackout. Among the most promising new reactor technologies are versions of the molten-salt reactor (MSR). Unlike the current fleet of light water reactors, which use pressurized water as a coolant and require active supervision, the MSR design relies on a combination of liquid fuel and a molten salt coolant.

This built-in passive safety feature necessarily reduces risk because it automatically prevents meltdown in an emergency, rather than requiring active efforts that may not occur due to confusion or other problems.

Other benefits of the SMR designs are that many do not produce weapons-grade plutonium; instead, they produce less-toxic nuclear waste and, in some instances, can use nuclear waste from Generation II reactors as fuel. Such improvements will reduce the financial risks of building a new nuclear power plant, because each module will cost less than today's large reactors and revenues can begin when the first module is complete, rather than after completion of a much larger unit.



SOURCE: Nuclear Regulatory Commission

ACTION ITEMS

Given the different risk profile of SMRs, how should they be treated under Price-Anderson? A 2010 study commissioned by the American Nuclear Society found that current nuclear insurance requirements are higher and attach at an earlier time than is commercially reasonable for SMRs. And, more specifically, the study concluded that advanced SMRs should not be accountable under the retrospective premium plan for accidents at large plants.

One idea to account for safer SMR technology is to update the requirement such that coverage should be based not on reactor power level, as it currently is now, but rather on the technology's safety and efficiency. Potentially, SMRs could be grouped into their own separate liability pool, relieving them of responsibility for accidents at larger plants. Reflecting their relative safety, participants in the SMR pool would be expected to pay lower rates to obtain the same levels of liability protection.

These ideas raise many questions about the details of implementation and practice, but are worthy of further consideration as we approach the next reauthorization period for Price Anderson.

CONTACT US

For more information on this subject, contact the R Street Institute, 1212 New York Ave. N.W., Washington, D.C. 20005, 202-525-5717.

Josiah Neeley
Director, Texas & Resident
Senior Fellow, Energy
jneeley@rstreet.org
512-415-2012

Bill Murray
Senior Fellow, Energy
wmurray@rstreet.org
202-374-4833