

Nuclear Power Plant License Renewal

February 2008

Key Facts

■ Nuclear power plants in the United States are licensed to operate for 40 years. The 40-year license term reflects the amortization period generally used by electric utility companies for large capital investments. It is not based on safety, technical or environmental issues. The Atomic Energy Act of 1954 permits nuclear power plants to renew their operating licenses.

■ Nuclear power plants are subject to a rigorous program of Nuclear Regulatory Commission oversight, inspection, preventive and corrective maintenance, equipment replacement, and extensive equipment testing. These programs ensure nuclear plant equipment continues to meet safety standards, no matter how long the plant has been operating. Because these sustained maintenance programs exist, the date that a nuclear plant started operating is not a reliable indication of its age or condition.

■ The NRC has renewed the operating licenses of 48 reactors. It is reviewing license renewal applications for 15 reactors and expects to receive applications for 23 more by 2013. These 86 reactors are

more than three-quarters of the total number operating in the United States. Most of the remaining 18 reactors are expected to renew their operating licenses as well.

■ A company's decision to renew a plant's license is fundamentally an economic one. It involves estimates of future electricity demand, the cost of other electricity supply options and the cost of continued operation of the nuclear plant.

■ License renewal contributes to the economic stability and employment of the plant community.

Why Nuclear Plants Have 40-Year License Terms

U.S. nuclear power plants are licensed to operate for 40 years. This term was specified by Congress in the Atomic Energy Act of 1954. The law was fashioned after the Communications Act of 1934, in which radio stations were licensed to operate for several years and allowed to renew their licenses as long as the stations continued to meet their charters. The Atomic Energy Act allowed for nuclear power plants to renew their licenses.

Congress selected a 40-year term for nuclear power plant licenses because this period

was a typical amortization period for an electric power plant. The 40-year license term was not based on safety, technical or environmental factors.

Each nuclear power plant is licensed based on a given set of requirements, depending primarily on the type of plant. This set of requirements is called the plant's "licensing basis."

A plant's licensing basis is an evolving set of requirements and commitments. Over time, as technology advances and operating experience provides new information, a plant's licensing basis may be changed—for example, when the NRC issues new requirements and the plant makes modifications. These new and additional requirements become part of the plant's licensing basis.

This constant oversight by the NRC ensures a plant will operate safely throughout its life.

Economics Drive License Renewal Decision

In deciding whether to pursue license renewal, a company will consider the economic situation of its plant—including where it is located, its capital cost and the competition in that area.



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At the end of a nuclear plant's 40-year license, initial capital costs for the plant will have been fully recovered and the decommissioning costs will have been fully funded. Any incremental cost incurred over the original license period could be amortized over a longer period of time because of license renewal, further reducing the cost of electricity. For many nuclear power plants, license renewal represents the most inexpensive option for future electricity generation.

As part of the planning process, each company must make some assumptions about future electricity demand and other supply options, including purchased power and transmission considerations.

NRC's License Renewal Requirements

For the NRC, a license renewal review must answer one basic question: Can the plant continue to operate safely during the period of extended operation?

The NRC issued a license renewal rule in 1995. To extend the operating license for a reactor, a company must demonstrate to the NRC that it will manage aging issues effectively during the renewal term, thus ensuring equipment functionality. The rule allows licenses to apply for extensions of up to 20 years over the initial 40-year term.

Some nuclear power plant components are replaced on

fixed schedules, while others are used until they show wear and then are replaced. These aging management activities will continue for as long as the plant operates.

The situation is somewhat different for components that were designed to last the life of the plant and might never be replaced. License renewal reviews focus on passive, long-lived components that are important to safety—for example, the massive concrete containment building that surrounds the steel vessel holding the plant's fuel, and the vessel itself. Periodic inspections and aging management activities verify acceptable performance for these systems, structures and components.

License renewal reviews also consider the potential environmental impact of continued plant operation.

The NRC amended its environmental protection rule in 1996 to establish requirements for environmental reviews of license renewal applications.

The agency said many potential environmental impacts of license renewal are common to all nuclear power plants and could be resolved for all plants through the revised rule.

A provision of the environmental regulatory process allows the public an opportunity to express concerns about

environmental impacts related to the license renewal application.

The agency identified about two dozen other issues that would require plant-specific reviews. They include the storage and disposition of used fuel, some aspects of water quality and use, aquatic life, and endangered or threatened species.

The NRC's license renewal review is a detailed process that includes on-site inspections. A typical license renewal review takes about 22 months.

License Renewal Status

For more information on nuclear plant license renewal, visit the NRC's Web site at www.nrc.gov.

This fact sheet also is available at www.nei.org.