

Nuclear Energy

Note 1. Pending Actions on Nuclear Generating Units. Much of Table 9.1 is based on the U.S. Nuclear Regulatory Commission (NRC) regulation 10 CFR Part 50, which has in most instances been supplanted by 10 CFR Part 52 following the passage of the Energy Policy Act of 1992 and procedural reforms initiated in 1989 by the NRC. (This statement applies to permit and license procedures only.)

In 2007, the NRC issued three Early Site Permits (ESPs) under 10 CFR Part 52—for Clinton (Illinois); Grand Gulf (Mississippi); and North Anna (Virginia). As of December 31, 2008, the ESP application for Vogtle (Georgia) was under review. No new ESP applications have been submitted since August 2006.

In 2007, the NRC had five Combined License (COL) applications under review—for Bellefonte 3 and 4 (Alabama); Calvert Cliffs 3 (Maryland); North Anna 3 (Virginia); and South Texas Project 3 and 4 (Texas), and William States Lee III (South Carolina). As of December 2008, an additional 12 COL applications were either under review or had been submitted to the NRC—for Bell Bend (Pennsylvania); Callaway 2 (Missouri); Comanche Peak 3 and 4 (Texas); Fermi 3 (Michigan); Grand Gulf 2 (Mississippi); Shearon Harris 2 and 3 (North Carolina); Levy County 1 and 2 (Florida); Nine Mile Point 3 (New York); River Bend 2 (Louisiana); Virgil C. Summer 2 and 3 (South Carolina); Victoria County 1 and 2 (Texas); and Vogtle 3 and 4 (Georgia). Of the 12 new COL applications, Bell Bend, Levy, Victoria, and William States Lee III are the only sites that do not yet have any reactors. These 17 COL applications represent a total of 26 reactors. In addition to the COL applications currently under review, Watts Bar 2 is currently under construction. Issued a construction permit for Watts Bar 2 in 1973, the Tennessee Valley Authority plans to complete construction and bring the unit on line in 2012. This is the only reactor that is anticipated to apply for the license separate of construction permit.

As of December 31, 2008, 14 applications for license extensions were under review by the NRC. The oldest application still pending, first submitted in July 2005, was for the oldest commercial reactor still in service, the Mark 1 Boiling Water Reactor at Oyster Creek. The most recent application, submitted on December 18, 2008, was for the Crystal River 3 plant (Florida). On April 8, 2009, the NRC granted a 20-year license extension to Oyster Creek, reducing the number of applications currently under review to 13.

For more information on nuclear reactors, see <http://www.nrc.gov/reactors.html>.

Note 2. Coverage of Nuclear Energy Statistics. In 1997, the Energy Information Administration undertook a major revision of Table 9.1 to more fully describe the history of the U.S. commercial nuclear power industry. The time frame was extended back to the birth of the industry in 1953 and the data categories were revised for greater relevance to current industry conditions and trends. To acquire the data for the revised categories, it was necessary to develop a reactor unit

database employing different sources than those used previously for Table 9.1 and still used for Table 9.2.

The data in Table 9.1 apply to commercial nuclear power units, which means that the units contributed power to the commercial electricity grid. A total of 259 units ever ordered was identified. Although most orders were placed by electric utilities, several units are or were ordered, owned, and operated wholly or in part by the Federal Government, including BONUS (Boiling Nuclear Superheater Power Station), Elk River, Experimental Breeder Reactor 2, Hallam, Hanford N, Piqua, and Shippingport.

A reactor is generally defined as operable in Table 9.1 while it possessed a full-power license from the Nuclear Regulatory Commission or its predecessor the Atomic Energy Commission, or equivalent permission to operate, at the end of the year. The definition is liberal in that it does not exclude units retaining full-power licenses during long, non-routine shutdowns. For example:

- In 1985, the five Tennessee Valley Authority units (Browns Ferry 1, 2, and 3 and Sequoyah 1 and 2) were shut down under a regulatory forced outage. Browns Ferry 1 was authorized by the NRC to restart in 2008, while the other units restarted in 1991, 1995, 1988, and 1988, respectively. All five units were counted as operable during the shutdowns.
- Shippingport was shut down from 1974 through 1976 for conversion to a light-water breeder reactor, but is counted as operable until its retirement in 1982.
- Calvert Cliffs 2 was shut down in 1989 and 1990 for replacement of pressurizer heater sleeves but is counted as operable during those years.

Exceptions to the rule are Shoreham and Three Mile Island 2. Shoreham was granted a full-power license in April 1989, but was shut down two months later and never restarted. In 1991, the license was changed to Possession Only. Although not operable at the end of the year, Shoreham is treated as operable during 1989 and shut down in 1990, because counting it as operable and shut down in the same year would introduce a statistical discrepancy in the tallies. A major accident closed Three Mile Island 2 in 1979, and although the unit retained its full-power license for several years, it is considered permanently shut down since that year.

Table 9.1 Sources: Operable Units: • 1955-1982—Compiled from various sources, primarily U.S. Department of Energy (DOE), Office of Nuclear Reactor Programs, "U.S. Central Station Nuclear Electric Generating Units: Significant Milestones." • 1983 forward—Energy Information Administration (EIA), Form EIA-860, "Annual Electric Generator Report," and predecessor forms. **All Other Data:** • 1955-1997—U.S. Atomic Energy Commission, *1973 Annual Report to Congress, Volume 2, Regulatory Activities*; Nuclear Energy Institute, *Historical Profile of U.S. Nuclear Power Development* (1988); EIA, *Commercial Nuclear Power 1991* (September 1991); DOE, *Nuclear Reactors Built, Being Built, and Planned: 1995*; U.S. Nuclear Regulatory Commission (NRC), *Information Digest* (1997 and 1998) and "Plant Status Report"; and various utility, Federal, and contractor officials. • 1998 forward—NRC, *Information Digest*, annual reports.