

## Decommissioning of Nuclear Power Plants

Although most nuclear power plants are licensed by the Nuclear Regulatory Commission to operate for *40 years*, there is no absolute age at which they become unsafe or uneconomical to operate. In fact, it may be **possible to economically extend** the operating lifetime of many reactors simply by replacing aging internal components. Once a plant has *been shut* down, it can be decommissioned (e.g., dismantled) within a few years, placed in safe storage for 30 to 50 years prior to decommissioning, or permanently entombed.

There are two reasons for delaying decommissioning once a reactor has been shutdown. First, as shown in the table below, the overall radioactivity of the LLW from decommissioning will decrease by 30 to 45 times, if decommissioning is deferred five decades. Deferral could therefore reduce worker risks and decrease dismantling costs. Second, the volumes of Class A, B, and C LLW generated from immediate decommissioning can be reduced by about 10 times if decommissioning is deferred five decades.

**Effects of Delayed Decommissioning on the LLW Generated by Commercial Nuclear Power Plants**

Plant type [1 ,175 GW(e)]	No delay	30-year delay	50-year delay
<b>Radioactivity of all LLW in thousands of curies:</b>			
Boiling-water . . . . .	6,600	180	140
Pressurized-water . . . . .	4,900	210	160
<b>Volume of all LLW in thousands of cubic feet:</b>			
Boiling-water . . . . .	670	670"	60"
Pressurized-water . . . . .	630	630"	65*

\*Includes wastes from both preparation for storage and decommissioning

SOURCE: U.S. Department of Energy, *Integrated Data Base for 1988. Spent Fuel and Radioactive Waste Inventories, Projections, and Characteristics*, DOE/RW-0006, Rev. 4, September 1988, p. 185.

For these reasons, many of the 113 operating nuclear plants, especially the approximately 70 plants that are colocated with other units, may be placed in "SAFESTOR" for five decades prior to decommissioning. It is not clear, however, that decommissioning of all nuclear plants will be deferred. If costs for LLW disposal continue to rise as they have over the last 15 years, it may be more economical to immediately decommission some plants. For example, older plants (i.e., constructed prior to 1970) that do not have well-documented designs and are not colocated with multiple units may be more economically decommissioned shortly after permanent shutdown before plant engineers are reassigned or retired.