

U.S. Nuclear Power—Has It Reached A ‘Dead End’?

If you were a member of the board of directors of an American electric utility, would you vote today to build a new nuclear-power plant? “Probably not,” says a report to the President’s Nuclear Safety Oversight Committee. And “if [our] simplification of the Director’s Dilemma is roughly right — and we believe it is — commercial nuclear power in the United States has reached a dead end.”

This gloomy forecast for the survival of America’s nuclear-power industry is mirrored by contemporary events. Not a single new order has been placed for a nuclear-power plant in the United States in three years, though purchase-commitments have been made for dozens of coal-fired competitors. This de facto moratorium on purchasing nuclear-power plants has been attributed to declining growth in electrical demand, high interest rates and heavy competition for capital in financial markets.

But in the new report, “Governance of Nuclear Power,” four members of Harvard University’s Kennedy School of Government note that when they speculated on the willingness of a utility director to vote on a nuclear plant, they assumed much more optimistic conditions:

- a growth in electricity demand in the area served by the utility requiring an additional 1,200 megawatts (MW) generating capacity by the early-to-mid 1990s,
- no “realistic” alternative to a nuclear base-load generating station other than a coal-fired plant,
- financing at prevailing rates, “which, though high, can nevertheless be covered by either of the proposed projects and in a manner consistent with the financial health of the utility,”
- and that at the same rate of return to the utility, the price of electricity from the nuclear plant would be substantially lower than from the coal plant — perhaps 30 percent lower.

With such relatively optimistic conditions, why would a utility director still opt against nuclear? “The shape of the underlying problem comes into focus as one confronts a question that has not been

articulated, but that must be the emerging nightmare of many prudent utility directors,” the report says. At its simplest, that question asks: What is the risk that events *beyond the utility’s control* and beyond its analysts’ best forecasts will delay by several years the date at which the plant comes on line—or worse still, will prevent the plant from ever operating?

A utility must commit upwards of \$2 billion to \$3 billion for a plant that is ordered today and expected to begin operating between 1993 and 1995. And according to the prognosis developed by the report’s authors, Graham Allison, Albert Carnesale, Paul Zigman and Francis DeRosa, that 12-to-14-year period “is likely to include” two or three presidents, three or four governors, and six to seven Congresses, state legislatures, Nuclear Regulatory Commissions and public-utility commissions that are clearly “anti-nuclear.” How might these affect prospects for a utility’s new plant? No one can know for sure, but these uncertainties cannot be ignored as major investment risks to a prudent utility director, the Kennedy School study contends.

But problems with the nuclear industry’s vitality go far beyond a lack of new orders by domestic utilities (manufacturers occasionally are still able to find a foreign buyer). For example, two partially completed plants were scuttled this year — Northern Indiana Public Service Co.’s Bailey-I on August 26, and Boston Edison’s Pilgrim-II on September 24. Though \$291 million had already been spent on the latter, Boston Edison now reckons that the plant’s initial cost estimate of \$400 million would ultimately prove at least \$3.6 billion too low. In fact, more than 80 previously planned plants have been deferred or cancelled in the past five years — 16 cancellations last year alone. In almost every case, the reasons were astronomical escalations in the projected cost of the plant caused by delays in design, construction and licensing.

The nation has only four vendors for its nuclear plants: Babcock & Wilcox, Combustion Engineering Inc., Westinghouse

Electric Corp. and General Electric Co. During the void in new sales, these companies have relied on a backlog of previous orders to keep their engineers and design teams busy. But the September 24, 1981 NUCLEONICS WEEK notes that B&W has virtually completed its backlog of eight plants, and is involved with component production for only one. And since the Three Mile Island accident, the ill-fated TMI-2 manufacturer has had seven additional cancellations for plants on order. CE’s backlog amounts to 13 plants, GE’s to 32, and Westinghouse’s to 55.

According to the August 31, 1981 BUSINESS WEEK, a vice president of GE’s nuclear-power-systems division claims that without “considerable new business in the next couple of years, management may elect to get out of the business.” And if one listens to Irvin C. Bupp, an energy analyst at Harvard’s business school, that might be wise. As he sees it, “There are not going to be any more nuclear [power-plant] orders in the U.S. in this century.”

Don Winston of the Atomic Industrial Forum disagrees. He told SCIENCE NEWS that the industry is still optimistic that a turnaround in the economy, coupled with licensing reform, should restore interest and ultimately sales.

Whether or not that optimism is warranted, it is essential that such optimism be maintained, the Kennedy School team says, because, “The perception of a dead end for nuclear power could well be a self-fulfilling prophecy.” If vendors left the nuclear business, “intimate knowledge of existing power plants and their design would degrade rapidly. If the enterprise were to be perceived as a ‘loser,’ there would be less able personnel in the reactor control rooms and at the regulatory agencies, heightening the risks to the 75-150 plants now operating and under construction.

“It *does* matter if nuclear power has reached a dead end. Whether the event is to be applauded or lamented is a matter of personal judgment, but it cannot be viewed as inconsequential.”

Though many proposals for aiding the ailing industry could affect the three major variables a utility considers when deciding whether to “go nuclear” — cost, safety and public acceptance — would any singly or in combination move the hypothetical utility director to vote for a new nuclear plant? “We suspect not,” the Kennedy School team says. If it’s important to maintain the U.S. nuclear industry, it recommends exploring two options: more subsidies to the industry, and nationalizing all or part of it. Neither is a popular concept, and as the study notes, the latter is prohibited by federal law. □

STATUS OF NUCLEAR POWER PLANTS\*

	1977	1978	1979	1980	1981
Licensed to operate .....	65	70	70	68**	70**
Licensed for testing .....	—	—	—	1	4
Construction permits issued .....	78	88	91	85	78
Construction permits requested .....	59	37	25	11	0
TOTAL	202	195	186	165	152

\*Figures as of Sept. 30 of each year.

\*\*Does not include four plants shut down indefinitely: Three Mile Island I and II, Humboldt Bay and Dresden I.

Source: NRC and AEP