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Nuclear Power—Rosy Optimism and Harsh Reality

A dramatic confrontation between rosy optimism and harsh reality is now gripping the attention of the electrical power industry. During 1966 and 1967, in a bandwagon atmosphere, large numbers of nuclear power plants were authorized. As of 1 April 1968, about 35 percent of scheduled additions to electrical capacity were nuclear. Recent events, however, have caused some observers to fear that optimism was overdone. The utilities have gambled heavily on unproven equipment, some of which will be brought on line far behind schedule. Power shortages could result.

A conspicuous example is the installation at Oyster Creek, New Jersey, which is now about a year and a half behind schedule. During field hydrostatic testing of the reactor pressure vessel on 29 September 1967, a leak was detected. A dye-penetrant test revealed that the leak was the result of flaws in a field weld made to join a control rod housing to a stub tube in the pressure vessel. Detailed examination revealed localized intergranular cracking in 123 of 137 stainless steel stub tubes, and welding defects in each of the 137 field welds joining the stub tubes and the control rod housings.

Many of the defects found were minor, and it seems unlikely that complete failure of a weld would have occurred had the weaknesses not been discovered. Even had such failure occurred, there would not have been a violent nuclear accident. However, if a leak or a weld failure had occurred after the reactor had operated for some time, the difficulty of repairing the defect would have been great, owing to intense radioactivity.

Before the Oyster Creek facility can be operated, it must be licensed. Three different groups will pass on the matter. First, there is the Division of Reactor Licensing of the Atomic Energy Commission, then the statutorily constituted Advisory Committee on Reactor Safeguards, and finally the Atomic Energy Commission itself. These bodies cannot be expected to act hastily. Defects in one aspect of the plant raise specters of other, yet undetected, flaws, and it is not certain that procedures used for repair of the defects will be acceptable. When the Oyster Creek generating plant will become operational is anybody's guess, but it could be in the distant future.

These delays will be costly in money and prestige. The Oyster Creek plant represented a courageous gamble by the General Electric Company, which, in 1963, undertook to guarantee delivery of a completed plant involving new design features at a stunningly low price. Announcement of the contract for the plant was widely regarded as signifying that nuclear power had come of age.

Following this event, other large nuclear installations were authorized at an increasing rate. Then came a great outcry against air pollution associated with coal-fired plants. The move toward nuclear power became a stampede. Delays at the bellwether Oyster Creek plant will have a sobering effect. An additional deterrent is the fact that costs of nuclear installations have increased by 40 percent during the last 2 years. Nuclear plants also have been tagged as important potential contributors to thermal pollution, since they are relatively less efficient thermally than coal-fired plants.

All of these difficulties will be surmounted, and nuclear power one day will furnish a substantial fraction of this country's electrical energy. How distant that day will be will depend mainly on how long it takes industry and labor to achieve new and higher standards of design excellence and quality control.—PHILIP H. ABELSON

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Philip H. Abelson

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