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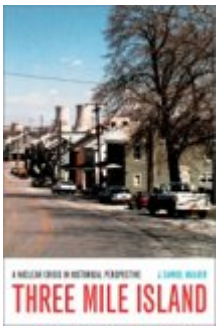
J. Samuel Walker. *Three Mile Island: A Nuclear Crisis in Historical Perspective.* Berkeley: University of California Press, 2004. xi + 315 pp. $26.95, cloth, ISBN 978-0-520-23940-1.



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In 1979, commercial nuclear power in the United States was at something of a crossroads. Following the nuclear heyday of the 1960s, there was a decline in new orders and existing orders were postponed or cancelled during the recession of the seventies. The anti-nuclear power movement was becoming increasingly vocal, but at the same time, the nuclear industry presented nuclear power as a remedy to the energy crisis. Then came Three Mile Island.

J. Samuel Walker's book, *Three Mile Island: A Nuclear Crisis in Historical Perspective*, gives a day-by-day account of the worst accident at a commercial nuclear power plant in U.S. history. The first three chapters provide background on the nuclear power debate, nuclear regulation, and planning for potential nuclear hazards; the middle chapters are each devoted to one day in the five-day crisis; and the final two chapters consider the immediate and long-term effects. Walker provides a brief account of the development of nuclear power from the bandwagon market of the late 1960s to the slump in the late 1970s, when power companies found themselves lacking financial resources at the same time that an economic downturn pared national energy consumption. Coupled with its economic woes was the rising political challenge of the anti-nuclear movement. At the height of the nuclear debate, a second unit was licensed for the Three Mile Island nuclear plant (TMI), but "the nuclear power controversy did not elicit much interest among the citizens of central Pennsylvania" (p. 46). Though two anti-nuclear groups questioned the emergency evacuation plans, and others worried that a plane from Harrisburg International Airport could crash into the plant, the license was granted. It was, in seemingly every respect, a completely unexceptional plant: "Other plants were larger, more controversial, and a much more visible part of the debate over nuclear power" (p. 49).

Walker explains that the Nuclear Regulatory Commission was not unfamiliar with the problems that beset TMI. A 1975 incident showed that there were problems with "the training and performance of plant workers, the lack of dependable means of communication during [an] accident, and lapses in emergency preparedness," but

the NRC did not treat these issues as "generic problems that needed careful attention and correction" (p. 68). Another close call came in 1977 at the Davis-Besse plant. Operators had difficulty interpreting conflicting emergency signals but fortunately, one operator discerned the problem of a stuck valve. This too might have served as a warning, but again, the NRC interpreted the problem as site-specific and took no industry-wide action.

On March 28, 1979, a series of tripped pumps and valves caused a reactor shutdown at TMI-2. The control rods entered the core as intended, but a stuck valve released large volumes of coolant--exactly as the valve had at Davis-Besse two years earlier. It was the failure of this valve that led to the meltdown at TMI-2. Walker gives a gripping account of these moments in the control room. Alarms sounded and lights flashed, but none pointed to the actual source of the problem. One poorly designed signal led the operators to presume the valve was closed. Another key signal was located ***behind*** the seven foot tall instrument panel, and in the commotion, no one thought to check it. The operators had not been trained for these conditions, and a series of wrong decisions compounded the technical problems. Poor training, as well as bad engineering and design, turned what might have been an easily resolved problem into a full-fledged crisis.

Much of the book focuses on the public relations issues as the NRC, White House, state and local officials, reporters, company representatives, their critics, and the public sought to determine how dangerous the accident truly was. The worst of the crisis was over by Monday, April 2, 1979, but the political consequences lasted much longer. Not surprisingly, anti-nuclear opinion soared. The presidential commission on TMI blasted the designers, owners, operators, and the NRC on training, design, management, communication, safety, licensing, and "complacent attitudes" (p. 212). Both the government and industry instituted a number of changes to remedy these defects. Walker writes that the "most serious, or at least the most visible, failure in the decade after Three Mile Island was the discovery in 1987 that plant operators and shift supervisors routinely slept while on duty" at the Peach Bottom reactor (p. 224), but concludes this section with a quote from ***The New York Times*** which supports the notion that things have changed since TMI.

In fact, there have been a number of other failures on the part of both nuclear plant operators and the NRC. (For example, in the mid-nineties, it was revealed that Connecticut's Millstone plant was illegally off-loading its entire fuel core at once. The problem was not addressed until whistle-blowers went public after being repeatedly rebuffed by the NRC.) Walker's underlying optimism leaves some unanswered questions. While Walker is mostly even-handed, his discussion of the health and environmental issues is quite limited. His summation of the medical research on TMI suggests that there has been little health impact, yet a recent ***Bulletin of Atomic Scientists*** article challenges this same research for its limitations: "Nothing exists in the literature on infant mortality, hypothyroidism in newborns, cancer in young children, or thyroid cancer, even though data for all of these were routinely collected in 1979. All of these conditions are especially sensitive to ionizing radiation."[1] In addition, the footnoting in the book is inadequate, with many paragraphs uncited.

Nonetheless, this is an interesting and readable book about an important event in U.S. nuclear history. Walker is at his best in his clear explanations of difficult technical data and his careful depiction of the political climate. Scholars of nuclear history and government policy will find much of interest. At a time when some wish to renew our commitment to nuclear energy, it is worth reconsidering this nuclear crisis.

Note

[1]. Joseph Mangano, "Three Mile Island: Health Study Meltdown," ***Bulletin of Atomic Scientists*** 60 (September/October 2004): pp. 30-35.