The Road to Yucca Mountain: The Development of Radioactive Waste Policy in the United States

J.S. Walker

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Nuclear waste management has long been a provocative and controversial topic. From the expansion of nuclear weapons during the Cold War through commercial nuclear power plants and the drive to provide alternative clean energy, the management of potentially harmful nuclear waste has been a serious issue in the United States over the last 60 years.

In his fifth book in a series of volumes on the history of nuclear regulation sponsored by the Nuclear Regulatory Commission, J. Samuel Walker traces the evolution of nuclear waste management policy in the United States from the Manhattan project to Yucca Mountain. This well-researched book thoroughly captures policy makers' efforts to find solutions to a complex issue while remaining mindful of public health concerns. The author highlights the complicated approach to policy development in the United States in a way that a wide audience can appreciate. Walker attempts an unbiased account using thoroughly gathered records from government agencies, papers by Johns Hopkins and Princeton researchers and from the National Academy of Sciences, and documents from presidential libraries including those of Ronald Reagan, Jimmy Carter, Gerald Ford, and Richard Nixon.

The book is organized into 8 chapters, which chronologically examine the evolution of increasing demand for nuclear energy and its corresponding surge in nuclear waste production. The author describes the development of management strategies to address nuclear waste disposal and depicts a changing public perception facing this problem. During his thorough attempt to outline the progression of this complicated topic, Walker considers a wide range of political and public concerns. His discussion allows the reader to appreciate the nuances of government bureaucracy and strategic alignments that are applicable to most areas of policy development within the United States.

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Early sentiments dating back to the 1940s were hopeful that there would be a solution to nuclear waste. Waste was soon classified according to "human risk stratification" (e.g., high-level and low-level waste). Limitations were ultimately established and were continually modified for occupational and environmental exposure, marking the launch of "health physics" as a field of practice. Research into the management of waste at that time also piqued the curiosity of U.S. regulatory agencies. Various methods of nuclear waste storage and disposal were discussed including dispersion into the atmosphere, dumping into rivers and oceans, and stowage within salt formations. In response, a series of agencies, including the Atomic Energy Commission, Nuclear Regulatory Commission, and subcommittees of the Department of Energy, to name a few, were formed to set standards and investigate the efficacy and safety of these and other proposed measures of nuclear waste management. Potential contaminants in the water supply, flaws in processing techniques, risks of transportation, and durability of storage containers were other practical concerns. In addition, an incident in a Lyons, Kansas, storage facility challenged the reassured opinion that the current systems were operating with low risk. As interest in nuclear power climbed over later decades, there was increased pressure nationally and in private facilities to find an acceptable and safe means of storing and disposing of nuclear waste. Ultimately, a strong national governmental force was required to reassure the public through the Nuclear Waste Policy Act of 1982 and its amendment in 1987. The final decision deemed Nevada's Yucca Mountain a relatively safe long-term natural storage environment. Despite the tumultuous formation of a national policy, it is clear that many specifics of the long-term management may not have been addressed. A central theme of almost blind hope and reassurance that nuclear waste management will somehow be solvable in the future, whether or not backed by scientific support, remains pervasive through the end of the book.

Among many highlights, Walker draws from speeches, reports, and letters from outspoken leaders in the field to

replicate the passionate voices of those involved in the development of nuclear waste management policy. His use of quotes such as, "Your ideas as to how we shall managed this 'unimportant' problem are characterized almost completely by total ignorance of the nature of disposal" (Abel Wolman, 1948) to "If it's so safe, why not bury the radioactive and toxic waste in their own backyards" (Jimmy Carter, 1969) capture the fervor of the debate. Walker does not lose sight of the growing public apprehension and criticism of nuclear waste management methods, sharpening the relatability of concerns over the future impact of nuclear waste.

The Road to Yucca Mountain is highly recommended for those interested in the complex problem of nuclear waste management and the evolution of public health policy in the United States. The author's ability to clearly detail the occasionally muddled landscape speaks to his talent in analyzing the historical factors of policy development and presenting it in an engaging manner. Given that the criterion for a safe storage goal had at one point been set to 1,000–10,000 years and that most radioactive materials have an at-risk exposure of many more half-lives, we may be asked to review the lessons learned in this book in due time.

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