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# The Influence of Hyman Rickover on a Navy

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Captain Timothy Somes, U.S. Navy (Retired)

Duncan, Francis. *Rickover and the Nuclear Navy: The Discipline of Technology*. Annapolis, Md.: Naval Institute Press, 1990. 374pp. \$28.95

**A**DMIRAL HYMAN G. RICKOVER had a remarkable influence on the United States Navy for several decades. It is indisputable that his influence continues long after his death. This carefully researched book seeks to prove that Admiral Rickover's control was due to his unrelenting insistence on two main ideas: ". . . that the professional civilian and military managers . . . had to rely on management precepts because they did not know the industry or project they were trying to run"; and ". . . that the future of mankind depended upon its control of technology." According to Francis Duncan, Admiral Rickover believed that an understanding of ". . . how he ran an important, complex technical program—one having civilian as well as military application—might contribute to the safety of a world increasingly dominated by technology."

Mr. Duncan's approach is to show how Naval Reactors—Admiral Rickover's carefully conceived headquarters organization—tightly controlled every aspect of the naval nuclear propulsion plant program. Through a series of chapter-length "essays," the reader learns how Rickover profoundly influenced the design and development of three major programs: the submarine program, the naval surface ships program, and the civilian reactor industry. The last essay may prove particularly instructive in its demonstration of how Rickover gained tremendous leverage and control by strategically positioning himself in both the U.S. Navy and the Atomic Energy Commission bureaucracies in the earliest days of the nuclear reactor programs.

The U.S. Navy's submarine fleet in the years after 1957 is the point of departure for this volume. Mr. Duncan briefly reviews the early years of the

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A professor in the National Security Decision Making department at the Naval War College, Captain Somes headed the War College's Joint Military Operations department for a number of years before his retirement from active service. A veteran of many years at sea in the submarine force, he commanded the USS *James Monroe* (SSBN 622), and was deputy commander, Submarine Squadron Ten.

naval nuclear propulsion plant program, then moves on to discuss Rickover's efforts to challenge other technologies already in use. (Mr. Duncan and Mr. Richard G. Hewlett have extensively chronicled the naval nuclear propulsion plant program in their book *Nuclear Navy 1946-1962*.) The chapter "Submarines" focuses on the years when new nuclear propulsion plants were being introduced. The S5W plant of the *Skipjack* and *Thresher-Sturgeon* attack submarines and Polaris submarines, the S6G plant for the *Los Angeles* class of fast attack submarines, and the S8G plant for the Trident missile submarines are briefly covered. Greater attention is given to Rickover's largely frustrated efforts to develop electric drive as an alternative to main reduction gears in the propulsion drive train of submarines. His extensive efforts to develop what ultimately turned out to be one-ship classes (*Narwhal* and *NR-1*) also receive special attention.

As Mr. Duncan states in his preface, this book deals only with Naval Reactors, Admiral Rickover, and the naval nuclear propulsion plant program. The reader will be disappointed who hopes to better understand why the U.S. Navy designed and built the *Los Angeles* class submarine with more speed but without many of the operational features that were found to be essential components of its *Sturgeon*-class predecessor. There is only a brief discussion of the ". . . *ad hoc* panel that Admiral Thomas H. Moorer, Chief of Naval Operations, had established on the recommendation of Rickover . . . to assess the configuration of the high-speed submarine, evaluate missions, and examine the proposed equipment." Of particular interest are the author's words that "Members of the committee were hardly rubber stamps, to be easily manipulated by Rickover or anyone else. But they were confronted with a choice between Rickover . . . and a senior official in the . . . defense establishment . . . They chose Rickover." "To get the speed, the panel sought every possible way to save weight. One method was to decrease the depth the ship could reach." Many submariners, including this reviewer, believe that far more than weight was sacrificed by Rickover and the "*ad hoc*" panel.

Duncan includes a lengthy discussion of the events leading up to the loss of the USS *Thresher* in 1963 and the subsequent soul-searching investigations. This is the most satisfying chapter of the book for this reviewer. The author details the very complex engineering problems that faced the navy when building the *Thresher*. She would be the first submarine of a class combining nuclear propulsion with depth capabilities significantly exceeding those of previous submarines. There would be radical departures in weapons handling and firing characteristics along with the introduction of a major advance in sonar technology, all placed in a hull shape that was designed for speed underwater. All this had required major innovations to integrate many of the ship's systems, only some of which had been used earlier. As Duncan carefully documents, problems with key systems remained unresolved. High-pressure air and hydraulic systems,

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and the extensive salt water systems with silver-brazed joints subjected to full submergence sea pressure, were sources of major concern to Rickover and the Naval Reactors engineers.

In discussing the intense investigations following the *Thresher's* loss during post-shipyard sea trials, the author carefully attempts to present all of the potential causes of the tragedy. This reviewer, having served for years in submarines designed and built in the same manner as the *Thresher*—each severely restricted in depth until finally “subsafed” years later—agrees with Rickover’s assertion that underlying problems “. . . of design, manufacture, inspection, quality control, and operating procedures were being ignored . . .” and were major factors in the *Thresher's* loss. However, the author’s bias as an “official” Naval Reactors historian is evident. He spends several pages ensuring that the reader understands Rickover’s belief that his procedures for reactor plant operation could not have contributed to the loss of the ship. That these procedures were “so rigid as to be a factor in the loss . . . was an incomprehensible argument” to Rickover. This statement contrasts with the author’s earlier discussion of a major flooding casualty in the diesel submarine *Barbel*. That submarine survived because her motors were immediately able to make full power. The reviewer’s personal experience in the years following the *Thresher's* loss in drilling relentlessly the urgently revised procedures for returning the nuclear propulsion plant to full power after a casualty shutdown at sea, suggests that Naval Reactors engineers concluded that overly rigid procedures were in fact a factor in the *Thresher's* loss. Many submariners also reached that conclusion. It seems to this reviewer that there was plenty of fault throughout the navy, including the Naval Reactors, for this tragedy. The author would have served the reader better had he not tried to suggest otherwise.

The reader, expecting to be thrilled by tales of nuclear surface ships in combat when reading the chapter title “Surface Ships—First Battles,” will be disillusioned. The emphasis in these chapters on surface ships is nicely summed up by the author’s subtitles, “The Alliance with Congress” and “Legislating Nuclear Power into the Fleet.” These chapters describe how a technically specialized officer in the middle of a very large United States bureaucracy became sufficiently powerful to wield a major influence into every part of that bureaucracy. The author carefully details the progressive stages of how Rickover attempted to force the Department of Defense to propel all major combatant ships with nuclear power. The author’s careful research, direct access to the Naval Reactors files, and his presentation, ensure the value of these chapters. But Rickover’s desire to have all major surface combatant ships propelled by nuclear power had to compete against the reality of cost. Other points of view are evident both in the author’s comments and in the final outcome. As the author points out when discussing the Aegis class cruisers, the ratio of cost was about two gas-turbine propelled ships for one nuclear propelled ship. For many that seemed a high

price to pay for the "tactical flexibility" of nuclear power. Implicit (if perhaps unintentionally) in the author's discussion of this issue is the concern voiced by those who were critical of Rickover's power within the navy. The author impels the reader to conclude that Rickover blocked the introduction of gas-turbine propulsion into the U.S. Navy for a number of years. The success of that technology in the fleet a generation later raises doubts about Rickover's ability to be as totally objective as the author suggests.

In a book about the nuclear navy, a chapter about a civilian electrical power generating plant may strike the reader as out of place. But by the time the reader reaches this chapter on the Shippingport power plant in western Pennsylvania, there will be no question that the book is really about the bureaucracy of Naval Reactors and its omnipresent director. This chapter is a classic case study of how an extraordinarily competent, highly skillful, government official can extend his authority into non-government industry. The author paints a sympathetic portrait of how a man whose vision and genuine understanding of the many costs of using nuclear energy to produce electricity influenced a generation of civilians in the field. The author concludes that the contributions of the Shippingport Atomic Power Station to civilian power plants were immense. Among other things, Shippingport demonstrated for the first time the feasibility of pressurized water reactors and light-water breeder reactors for civilian use. Many civilian components were first used there. Practical solutions to such basic problems as radiation safety and reactor control were benefits of the Shippingport initiative. Above all, the author stresses the high standards upon which Rickover insisted, a theme that is the focus of the final chapters of the book. There is little doubt that the reader is supposed to conclude that if these Rickover-dictated standards had been in place throughout the civilian industry in 1979, the disaster at the Three Mile Island nuclear power plant would not have occurred. If this thesis is difficult to corroborate, it is nevertheless convincing for most who have worked in the naval nuclear reactor program. An interesting aspect of this chapter is that Rickover may have stayed in place too long and that his ability to influence events was fading. The author writes, ". . . Shippingport's mission was accomplished, and its importance diminished." Possibly an unintended theme throughout this book is that these words could also be applied to Rickover in his final years in office.

The final section of the book returns to the theme that the author introduced in the book's preface. In three chapters entitled, "The Devil is in the Details," "Independence and Control," and "Discipline of Technology," the reader recognizes that a healthy dose of Rickover's no-nonsense philosophy is forthcoming. It is in these chapters that the author reviews Rickover's frequently controversial method of selecting naval officers and engineers for his programs. Explained are the skillful variety of auditing and monitoring programs by which he often bypassed normal chains of command, consequently exercising enormous