Preface: Why This Book?

It's not over. We're going to see a nuclear exchange in the next 25 years, almost surely.

Daniel Patrick Moynihan, 2000

This is a book about the changing face of nuclear war in the twenty-first century and how the U.S. government is managing, or mismanaging, the new dangers. With the Soviet Union gone and the United States engaged in a deadly struggle with murderous but low-tech terrorist adversaries, the subject may strike some readers as anachronistic or even anticlimactic. Supposedly the potential for the all-out, civilization-ending nuclear paroxysm that we each came to terms with in the twentieth century has dramatically receded. Thankfully, that is true, but it is also true that these devastating weapons are still with us, still ready for war. And now the rules for their use are quietly being rewritten, year by year, country by country.

The *complexity* of the global nuclear standoff has increased dramatically, and there are now many more ways nuclear conflicts might start. We must envision now not only the bilateral superpower conflict of old, but also regional conflicts, ethnic last stands, anonymous terrorist acts, and, as always, accidental nuclear war. Though the nuclear conflicts that might occur in the future will probably be smaller than what we had to envision in the past, even a small nuclear war would be incomparably horrible.

All these are good reasons for a revived interest in the subject, but the reason we should be not just interested, but *alarmed*, is that the U.S. government, clearly the biggest nuclear player of all, is increasingly delegating the direction of nuclear weapons policy to jaded bureaucrats who

are more concerned with inside-the-beltway points than with protecting the people of the world from the devastation of nuclear war.

This book provides an insider's perspective on how matters pertaining to nuclear war and weapons are increasingly controlled by political game players and their captive technical specialists. It follows a particular chronicle about how the explosive ingredients of U.S. nuclear weapons are produced and how U.S. officials have recently abandoned a long-standing policy forbidding their production in commercial nuclear power plants. The particular material on which the book focuses is tritium, a form of hydrogen needed to turn an A-bomb into an H-bomb. The commercial power plants that will produce it are of a type known as "ice condensers"—hence the title, *Tritium on Ice*.

I will argue in this book that the abandonment of the policy isolating commercial nuclear power from nuclear weapons manufacture is an unwise retreat from this country's commitment to curb the proliferation of nuclear weapons around the world. Perhaps even more important is the trend that the decision represents: a drift from vigilance about nuclear proliferation to complacency. This trend poses a distinct danger for the future, and everyone in the world is exposed to that danger.

The bureaucrats themselves may try to obscure the issues with technical fast talk and appeals to classified information, but at the core the issues are straightforward. Advanced degrees in science are not needed to understand them, nor is access to classified information. The principal agent for restoring responsibility to the U.S. decision-making process is an informed public. That is why you should read this book. The stakes are large, and they involve you and your world.

The flip side of the question "why this book?" is why did I write it? I have spent twenty-five years as a physicist in the service of one of the U.S. government's three nuclear weapons laboratories. The greater portion of my career at Sandia National Laboratories involved two subjects: the safety of commercial nuclear reactors and the production of tritium for nuclear weapons. Until recently, the two subjects were quite distinct. Now, the aforementioned reversal of policy means that they intersect directly over the safety of the two nuclear power plants that are to be modified to produce tritium. My professional experience with the safety profiles of these particular reactors and my understanding of the high-stakes politics of tritium production lead me to fear that scientific

objectivity about the potential for severe accidents at these sites will be lacking.[1]

And objectivity in the face of the powerful players in this complex game will be sorely needed. There are serious grounds for worry that ice condenser plants could undergo catastrophic accidents, exposing nearby populations to fatal doses of radioactivity. The fact that the operator of the plants is the Tennessee Valley Authority, a federal agency with a long history of compromising nuclear safety, exacerbates the potential danger. Careful study of these concerns is of critical importance before the government proceeds down the path of modifying the plants, but instead the key safety issues have received little attention.

The trade-offs between our modern society's need for electricity and the need to protect the public from the methods of its production are not easy to balance, nor are the trade-offs between national security and nuclear arms reduction. But we cannot expect our government to pursue policies reflecting the interests of the public unless the public is aware of the issues and creates the incentive for officials to stay focused on their responsibilities. This book is a contribution toward that goal.

Just thirteen years ago the oil tanker *Exxon Valdez* ran aground in Alaska's Prince William Sound, causing the worst environmental disaster in U.S. history. The cause? Press accounts in the aftermath pointed to the ship's captain, Joseph Hazelwood, supposedly inebriated to incapacity when he should have been piloting the ship. But the true cause of the grounding and the subsequent botched recovery operation was deeper and more troubling. John Keeble, in *Out of the Channel*,[2] shows that years of corporate pressure to increase profits had created a working environment for Alaska tanker operations that made such a disaster inevitable. Keeble describes safety standards trimmed to bare bones with little thought of their adequacy, equipment and services critical for safe navigation downgraded to save costs, and safety procedures routinely violated or ignored. Then, one clear and cold March night in 1989, an undermanned, overtired, and underqualified crew slowly steered the massive oil tanker into a well-marked reef.

The root cause of the *Exxon Valdez* disaster lies in the collective behavior of a whole community of people, including the officers and seamen of the fleet, the people who established and managed the oil company's safety standards, the people who enforced those standards, and most of

all the leaders on both the private and government sides who created the incentive environment for all the players. There was something wrong with the priorities of these people, and after the disaster much attention was paid to realigning their priorities so that similar disasters would be avoided in the future.

Today there is something wrong with the priorities of the agencies charged with managing the government's actions on nuclear weapons and war. The time to address these problems is now, not after irreversible disaster occurs.