Supplying the Nuclear Arsenal

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Conclusion:

Supplying the Cold War Arsenal

The three production reactors at Hanford which produced the awe-inspiring weapons that abruptly ended World War II were the first of an eventual 14 production reactors in the United States. Two more reactors were added in the early years of the Cold War, as tensions mounted between the Soviet Union and the United States, bringing the total to five. After the Soviets exploded their first nuclear bomb, the United States decided to work towards a fusion weapon and undertook to build three more reactors at Hanford and five at Savannah River, capable of making tritium as well as plutonium.

The Manhattan Engineer District and its successor agencies were created out of existing communities of scientists, corporate executives, and army officers. The tensions between the free-wheeling academic style of the scientists and the security-conscious military men received much public attention in biographies and memoirs. But to harness the business community, further compromises had been required. The result was the evolution of Army Corps contracts into the structured government-owned contractor-operated facility, the GOCO. Only through such a contract vehicle could the government attract and hold with the necessary financial incentives long-term assemblies of scientists, technicians, administrators, and support staff. As policy changed over the following decades, those GOCO communities developed articulate political clout. Community leaders and spokesmen like Glenn Lee at Richland, Washington, soon spoke out for the contractors' employees. Congressmen and senators grew increasingly sensitive to the lobbying and voting
power of the constituents clustered in Washington, Idaho, and South Carolina.

Decisions regarding plutonium and tritium supply could not simply be made behind closed doors. Corporate and public interest groups and a powerful group of senators and members of Congress watched nuclear policy closely, even if the more general public remained relatively unconcerned.

Meanwhile, the profession of nuclear engineering grew and evolved, reflecting the increased influence of those who first sought to turn reactors to ship propulsion and then to civilian power production. Experiments and demonstrations through the 1950s generated a variety of reactor cousins, designed to help supply the nation’s and the world’s need for plentiful electrical energy. In this context, the Atomic Energy Commission added its fourteenth production reactor, the odd hybrid, N reactor, which was a cross between a production reactor and a power reactor, optimized between two functions. No sooner was N reactor on line, however, than the United States achieved a sufficient stockpile of plutonium; thus, all but the four newest reactors were closed during a period of plutonium oversupply and political détente. As the older reactors closed, the new emphasis on peaceful uses of the atom pushed the total megawattage of power reactors higher than the total megawattage of the remaining small family of production reactors. For nearly a decade, through the 1970s, the four remaining production reactors supplied the nation’s need for strategic materials.

The rise in tensions between the United States and the USSR following the Soviet invasion of Afghanistan and the strong defensive posture of the United States in the 1980s required advance planning to meet the forthcoming tritium shortfall and the increased need for plutonium in MIRV weapons. That anticipated shortfall became more imminent as the last of the 14 reactors closed forever. Increasing public distress at the environmental risk of both power reactors and production reactors accelerated those closures. Although some journalists and political critics believed as early as 1988 that the natural disarmament brought by tritium decay should be allowed to proceed in the United States whether or not the Soviets agreed to halt tritium production, the mission to build a reactor was not abandoned. Secretary of Energy Herrington left the task to his successor, Admiral Watkins; as head of the newly created Office of New Production Reactors, Monetta moved decisively to get a single design that he could present as the best possible one, uninfluenced by political pressures or special interests.

Despite these efforts to reach an unbiased decision, technopolitics con-
continued unabated, as the backers of the two leading conceptual designs focused their efforts on making good presentations and developing arguments useful against the opposition, and as congressional representatives of the potential sites continued to maneuver for position. Had a decision been announced, the corporate and political backers of the excluded designs would have mounted a vigorous public relations campaign to reconsider in congressional and media forums the relative virtues of the systems. To assume otherwise would be naive.\(^1\) Yet such a discussion could have taken place against a background of objectively measurable financial, engineering, and scientific data collected in a fair fashion.

Planning for new production reactors moved from a squabble over patronage into a managed decision environment that demonstrated how data for a difficult technical choice which could generate billions of dollars of employment might be gathered and developed both objectively and rapidly. Systems analysis could be funded on three separate conceptual designs, the merits of the developments could be measured and reviewed by experienced and independent experts, and the final executive choice could be based on financial and design criteria, which although presented by advocates, had been collected without favoritism. Whether the ultimate decision could be equally nonpolitical was doubtful, and the question was never put to the test.

With the end of the Cold War, there was no longer a pressing need for an assured tritium production capacity. The effect of the changed international situation was to move new production reactors for strategic nuclear materials to a much lower priority. The technology, the capacity, and the planning, while necessary to the maintenance of a deterrent nuclear arsenal at the height of the Cold War from the 1950s through the early 1980s, quite suddenly came to an end.

Two Department of Defense consultants had suggested in 1990 that “virtual deployment”—that is, active planning towards a future weapons development—could influence the behavior of adversaries. In retrospect, the ONPR effort seems to have been just such a program. The Office of New Production Reactors, with its high-profile, increasing design expenses, and its widespread public hearings over environmental impact, like the Strategic Defense Initiative of the Reagan administration, may have served a purpose in international negotiations even though no foundation was dug, no concrete poured. Together with the temporary but well-publicized effort to restart K reactor at Savannah River, ONPR demonstrated that America could
keep up its nuclear deterrent if needed. The Soviet regime, in its last year of power, had ample evidence that if no START agreement were reached, the United States was capable of devoting billions of dollars to tritium production and to a continued arms race.²

Although the next generation of production reactors was suddenly aborted, the project left several legacies. One legacy was a method which might be employed in other competitions for such massive projects. Multibillion-dollar engineering feats of the future in which more than one design might be appropriate required a procedure that allowed for selection on grounds of technical merit, rather than on the basis of political influence, and that at the same time permitted the general public and interested parties to participate through the open methods developed since the days of World War II. The structure and procedures of ONPR could serve as a model for efforts to control or at least mitigate the effect of patronage battles in favor of efficient technological choice for projects of such magnitude. Yet, as always, those technological choices would be subject to the pressures of professional identification, theoretical and engineering styles, corporate cultures and corporate interests, as well as to the power of interested members of Congress. Engineering, budget analysis, and management could only go so far as tools to reduce the difficulties of technopolitical choice.

Dealing with the legacy of generations of radioactive waste and hazardous effluent, the vast establishments at Savannah River and Hanford converted their priorities to environmental cleanup and restoration. The effort promised to cost far more than the original cost of constructing the weapons complex. For nearby residents and downwinders, the nuclear heritage remained a public health concern.

Still another legacy of the nuclear arsenal and the production reactors that had fueled it was the technology itself, readily imitated by nations seeking new weapons with which to exert their power. At the heart of the nuclear arsenal were the reactors that produced the strategic materials, and reactor design and technology had spread around the planet. Representatives of the international community, working through the International Atomic Energy Agency, sought to determine the possible date at which Iraq and North Korea would join the world’s nuclear powers, and the nuclear threshold status of those two states remained critical international issues through the early 1990s. Power-generating and research reactors in both Iraq and North Korea, as well as in more politically stable nations, could be readily
diverted from their ostensible peaceful purposes to play the role of production reactors.

If and when the United States decided to resume tritium production to resupply its nuclear arsenal, the massive legacy of technical plans and designs created over the 1980s and 1990s was available.