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Background to Fiasco

In June 1968, while many communities in the Pacific Northwest were preparing to celebrate their centennials, Richland, a small city in southeastern Washington, commemorated its tenth anniversary as an incorporated city and the twenty-fifth anniversary of the community’s modern beginning, the designation of Hanford, Washington, as the site of plutonium production for the Manhattan Project. Amid the reminiscences and self-congratulations of the 1968 festivities, one highlight was Glenn Seaborg’s banquet address on Friday, June 7.

Seaborg was truly one of the high priests of the nuclear era. While still in his twenties, he had been a co-discoverer of plutonium. In early 1942, he launched an extensive research program to isolate the element in quantities sufficient for bomb production. His success paved the way for Hanford’s mission in the Manhattan Project, manufacturing enough plutonium for the “Trinity” bomb exploded above New Mexico and the “Little Boy” weapon dropped on Nagasaki on August 9, 1945.

When Seaborg visited Richland and the Hanford site in 1968, he was chairman of the Atomic Energy Commission. His address to the dignitaries that evening presented his vision of a peaceful nuclear America. Hanford had just been chosen to house the Fast Flux Test Facility, a breeder reactor development project. For Seaborg, this was only the start. In the future, a complex of very large breeder reactors could generate vast quantities of cheap electricity and industrial process heat. Heavy industry could locate in the complex – a “nuplex.” In the words of the local newspaper, “With the nuplex, conventional resources could be processed more cheaply; new and exotic materials would be produced, and most of the waste could be recycled on an economic basis.” Seaborg held out promises of a “junkless society” and of heavy industry separated from major cities, which would, “once again become a place primarily for
people.” He reflected, “Perhaps 25 years from now we will be able to gather here to look back over a half a century of progress of the nuclear age. . . . And we will be able to reminisce about the beginning of the nuclear age while we see about us many of the wonders that it has brought and continues to unfold.”

More than sixty years after the Hanford facility was built, the nation’s nuclear fate must give pause to the followers of Seaborg’s dream. The Hanford Generating Project, which used steam from a plutonium-producing reactor to produce electricity, closed down in the wake of the Chernobyl disaster of 1986. There is no American breeder reactor. Congress killed funding for the Clinch River (Tennessee) reactor, the centerpiece of the breeder program, in 1983. Energy Secretary James Watkins placed Hanford’s Fast Flux Test Facility, which originally was to irradiate fuel for Clinch River, on “cold standby” in the waning days of the first Bush administration. In 2006, as work on a permanent shutdown was underway, the American Nuclear Society designated the reactor a National Nuclear Historic Landmark. There is no nuplex, at Hanford or elsewhere, no cornucopia of costless energy and clean manufacturing. Indeed, no utility in the country has ordered a nuclear reactor since 1978. Once expected to serve half of the nation’s electricity needs by the year 2000, nuclear reactors generate only about one-fifth.

Commissioner Seaborg’s predictions for Hanford and the Pacific Northwest were far off the mark. Following the shutdown of the Hanford Generating Project, Portland General Electric Company, owner of the Trojan nuclear plant in Rainier, Oregon, closed it in 1993, leaving only

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one functioning power reactor in the region, the Washington Public Power Supply System’s (now Energy Northwest’s) Nuclear Plant 2 (now renamed the Columbia Generating Station) at Hanford. This facility represents only a small fraction of the Supply System’s grandiose plans. It had committed to build and operate five large plants. Yet today hydropower remains the region’s basic source of electricity; regional energy planners contemplate conservation, renewable resources, and small-scale natural gas-generating facilities rather than large nuclear reactors. In a disturbingly ironic turn, the area around Hanford itself is now a focus of environmental anxiety for the Northwest. Airborne radiation releases, both unplanned and deliberate, liquid wastes in aging single-walled underground tanks, and lapses in worker and community health procedures all make cleaning up the primary mission of Hanford in a post–Cold War era. The nuclear alchemists’ handiwork at Hanford and elsewhere is now our problem and our descendants’ burden.3

The 1968 Hanford observances took place against a backdrop of intensive planning to bring nuclear energy to the Northwest. Four months later, utility leaders announced a Hydro-Thermal Power Program.4 As the name suggested, the plan proposed a shift from almost exclusive reliance on energy from water spilling over the giant dams on the Columbia River and its tributaries to a hybrid system where thermal* generation (steam driving turbines) would supply the base load for residential, agricultural, commercial, and industrial customers. Hydropower would serve users in times of peak demand. Nothing if not ambitious, the Hydro-Thermal


4 U.S. Department of the Interior, Bonneville Power Administration, A Ten Year Hydro-Thermal Power Program for the Pacific Northwest (January 1969). The program was first publicized in October 1968; the published document is dated January 1969.

* Some definitions: Thermal generation uses heat to make steam to drive turbines. Fossil fuel generation is a subset, in which the fuel is, in almost all cases, coal, natural gas, or petroleum. Nuclear reactors create thermal power, but nuclear materials are not fossil fuels.
Nuclear Implosions

Power Program called upon utilities in the region to build and operate ten large thermal plants by 1980. Extrapolating further, it suggested that the Northwest would need another ten generating facilities in the following decade. These projects would supply a demand expected to triple by 1990.

Even before the Hydro-Thermal Power Program, the Washington Public Power Supply System had volunteered to undertake a large nuclear plant for the consumer-owned utilities of the region. At the time, the Washington Public Power Supply System was a small organization headquartered in Kennewick, adjacent to Richland. By 1976, this agency had agreed to finance, build, and operate five large nuclear power plants to help meet the region’s predicted energy needs. By the end of the 1970s, WPPSS* had become the largest single municipal borrower in the nation. Fourteen thousand workers were building the plants at the peak of construction activity in 1981. The Supply System itself, which had 81 employees when construction began in 1971, employed a staff of over 2,000 a decade later.5

But gargantuan plans meant colossal problems. The plants all fell far behind schedule and costs soared. Demand for electricity lagged well behind earlier predictions. In 1980, the Supply System Board of Directors forced the Managing Director to resign and hired Robert L. Ferguson, who had been Deputy Assistant Secretary of Energy in the Carter administration. Ferguson soon called for a thorough budget review. In May 1981, the study disclosed that the estimated total cost of the five plants would be $23.9 billion, more than five times original estimates. Ferguson slowed down construction on Plants 4 and 5. By the following January, he felt forced to call for terminating these projects. Three months later, the Supply System imposed a construction moratorium on Plant 1, and in 1983 halted work on Plant 3. When Plant 2 finally opened in December 1984, the region already had a surplus of electric power, a condition that lasted into the next decade. Table 1.1 summarizes the projects’ ownership, financing, costs, and eventual fate.

* Because the initials WPPSS would be pronounced as “Whoops,” the Washington Public Power Supply System tried to avoid this abbreviation. Its managers referred to the agency as the Supply System. This book will use the two shorthand versions interchangeably, with no invidious connotations meant to apply to WPPSS. In 1998, the Supply System changed its name to Energy Northwest. In references to events from that year on, we will call the organization Energy Northwest.

### Table 1.1. WPPSS nuclear projects summary

<table>
<thead>
<tr>
<th></th>
<th>WNP-1</th>
<th>WNP-2</th>
<th>WNP-3</th>
<th>WNP-4</th>
<th>WNP-5</th>
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<td><strong>Location</strong></td>
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<td>Hanford Reservation</td>
<td>Satsop</td>
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<td>net billed</td>
<td>net billed</td>
<td>88 participating utilities' shares of &quot;project capability&quot;</td>
<td>88 participating utilities' shares of &quot;project capability&quot;</td>
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<tr>
<td><strong>Cost Estimate May 1981</strong>¹</td>
<td>$4.268 billion</td>
<td>$3.216 billion</td>
<td>$4.532 billion</td>
<td>$5.510 billion</td>
<td>$6.261 billion</td>
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*Initial financing estimates are the amounts announced at the time of the initial borrowing for each project.

¹WNP-4 and WNP-5 were financed jointly through bond issues for both projects. Bonds were issued for each net-billed plant separately.

Meanwhile, the termination of Projects 4 and 5 set in motion a legal struggle over the $2.25 billion that WPPSS had borrowed for these facilities. Eighty-eight Northwest public utility districts, municipal utilities, and rural electrical cooperatives had signed Participants’ Agreements in 1976 that seemed to bind them to pay for shares of the projects’ generating capabilities, whether or not they were successfully completed. In June 1983, however, the Washington State Supreme Court ruled that utilities in that state had lacked authority to enter into the Participants’ Agreements. Hence, the court argued, the utilities did not have to make payments on the bonds. Northwest political and business leaders scrambled for other ways to meet the bond obligations, but in August 1983, WPPSS defaulted. In a sad addition to the Supply System’s list of superlatives, this was the largest municipal bond default in American history.

This book describes the rise and fall of the Supply System. It is a story rooted in the Pacific Northwest’s distinct regional history. The developmental role of low-cost hydroelectric power, exemplified by the Bonneville and Grand Coulee Dams on the Columbia River and the establishment of the Bonneville Power Administration in 1937, made Northwesterners acutely aware of the importance of electricity to the region’s economy. With the exception of the Tennessee River Valley, nowhere else did the federal government play such a large role in electrical energy generation and transmission. Moreover, nowhere else in early and mid-twentieth century America did the politics of electricity stay on center stage for so long. Struggles between public and private power interests were features of the region’s political climate for decades. Some of the Supply System’s leaders and cheerleaders saw the agency as the heir of the Northwest’s public power pioneers.

Yet the Washington Public Power Supply System did not stand in isolation in the “far corner” of the contiguous United States. It reflects several nationwide trends in energy policy and public utilities. The WPPSS collapse is the story of fatally flawed demand projections, incessant problems of construction management, and thorny political conflicts on the uneasy borderline between public and private sectors. Accounts of nuclear energy projects across the country reveal similar problems.6

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This is also a story about some of the most crucial developments in the recent American political economy: the shift from an era of buoyant expectations of growth to an age of limits; the emergence of new, high-stakes, and risky ventures in finance; the new environmental and consumer movements of the late twentieth century; the costs of making decisions and resolving disputes in a litigious society; the problems that arise when technological possibilities outrun organizational capacities for large-scale projects. Finally, as earlier commentators on the history of nuclear energy have observed, civilian nuclear power bears a close though ambiguous relationship to the military uses of the atom. With three of its reactors sited on the Hanford Nuclear Reservation, WPPSS indicates some of the subtle yet important ways that war, hot and cold, has permeated American society.

The Supply System’s ventures, therefore, need to be situated in both their national and their regional contexts. With over thirty years of hindsight, the decisions to move toward a nuclear electric energy base in the Northwest present a picture spotted with folly and ineptitude. Looking at the lessons that generation of power planners drew from prior experience will help to make their choices understandable even if we cannot deem them wise.

The Hydroelectric Legacy

The Columbia River has for centuries been the source of much of what was and is distinctive about the Pacific Northwest. Native Americans

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have lived near its banks for at least twelve millennia, and coastal Indians traveled upstream to meet with inland peoples. The salmon that spawn upstream in the river and its tributaries remain an integral part of Native cultures, despite threats to the continued viability of the salmon runs. In the nineteenth century, the Columbia was the axis of transportation for European-American exploration, settlement, and commerce in the Oregon Territory. In the twentieth century, damming the Columbia River system provided the electric power that transformed the region.

The Columbia River is 1,243 miles long, slightly more than half the length of the Mississippi. From its source in the mountains of eastern British Columbia, it flows south, cutting through the arid territory of eastern Washington. The Snake River joins it near the Tri-Cities of Pasco, Kennewick, and Richland. Soon it turns west and forms the border between Washington and Oregon. At Portland, the Willamette River merges with it from the south. The Columbia flows into the Pacific near Astoria, Oregon. In its journey, the Columbia drops 2,650 feet in elevation, almost twice as large a decline as the Mississippi. Stream flow is prodigious, averaging 265,000 cubic feet per second. The water that flows through the Pacific Northwest's rivers almost equals the volume in all other rivers west of the Mississippi.

The laws of physics decree that the potential for generating electricity from falling water depends on these last two factors, the vertical fall and the volume of water. On both these counts, the Columbia and its tributaries served the region's electrical energy needs well. Indeed, the region has about one-third of the nation's hydroelectric capacity potential. From early in the twentieth century, there were those who pressed for hydropower development. Rufus Woods, owner and publisher of central Washington's Wenatchee Daily World, campaigned tirelessly for damming the Columbia and irrigating the Columbia Basin desert. J. D. Ross espoused the cause of public ownership and development of hydro resources as head of Seattle City Light, the municipal system. The Oregon and Washington Granges ardently advocated public power and pressed for legislation in both states that allowed formation of public utility districts.

Yet in this sparsely populated region, the river system’s capacity went untapped until the New Deal years. Early in the century, private power companies balked at the capital investment needed to bring electricity to rural areas, and conservatives contended that schemes to dam the river for power would end up lighting the desert for jackrabbits and rattlesnakes. Franklin D. Roosevelt, however, had met James O’Sullivan, a reclamation engineer and development enthusiast, while campaigning for vice-president in Spokane in 1920. O’Sullivan persuaded Roosevelt, and the future president never changed his mind. Campaigning in 1932, Roosevelt told an enthusiastic crowd in Portland that the federal government should exploit water power sites for the public benefit. These sources could provide a yardstick both to measure and to control the cost of private power.

FDR’s pledge soon translated into action, and construction began on both Bonneville and Grand Coulee Dams in 1933, although Grand Coulee’s official authorization did not come until passage of the 1935 Rivers and Harbors Act. Bonneville, located forty miles east of Portland, became an Army Corps of Engineers project, while the Bureau of Reclamation took charge of Grand Coulee, in north-central Washington.

Bonneville Dam was itself a formidable undertaking. The Columbia’s banks at Bonneville were soft, not hard rock, and anchoring the dam was a struggle. The river’s flow also complicated construction. Northwest rivers swell each spring as the mountain snowpack melts; in 1936, the waters broke through an earthen cofferdam above the Bonneville construction site and smashed into the partially completed structure. Yet, working around the clock, builders completed the dam on schedule, and President Roosevelt dedicated it on September 28, 1937. “We can well visualize a date, not far distant, when every community in this area will be wholly electrified,” he proclaimed.

Two months earlier, Roosevelt had signed the Bonneville Project Act to provide an administrative structure and policies for Northwest electric power. Leaders at the time viewed this as an interim measure to

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allow Bonneville Dam to function while politicians worked out a plan for a more comprehensive Columbia Valley Authority modeled on the Tennessee Valley Authority. But repeated proposals for broad regional development planning met defeat. Nearly seventy years later, the act and the agency it created, the Bonneville Power Administration (BPA), continue to shape many of the Pacific Northwest’s energy policies.

A key element of the enabling legislation resolved an intense bureaucratic feud and set regional power policy on a pro-development path. Having built Bonneville Dam, the Corps of Engineers was eager not only to operate it but to distribute its power. Yet the Corps believed that the Northwest’s market was limited. It proposed building only two short transmission lines and giving industries near the dam site reduced rates. That perspective appealed to Portland area businesses but angered public power advocates in the rest of the region. These forces favored civilian control, an extensive transmission network, and uniform power rates around the region, “postage stamp” pricing as it came to be called. In early 1937, Washington Senator Homer T. Bone proposed a formula giving control of the dam to the Corps but establishing a civilian transmission agency.

Placing BPA within the Interior Department put it under Secretary Harold Ickes, a public power backer. The Bone compromise, by creating a civilian agency in Ickes’ department, appeared to benefit those favoring comprehensive development and public power. Indeed, Roosevelt’s choice of J. D. Ross, perhaps the leading figure in the Northwest’s public power movement, as the first Administrator acknowledged this orientation. Ross had an expansive view of Bonneville’s mission. “It is not just what the electricity costs; it is what our people can do with it that constitutes the help to humanity and makes it a real success.”

The Bonneville Project Act gave BPA a green light to become a regional power transmission and marketing agency, the main role that it still plays today. (In 1940, an Executive Order gave BPA the task of transmitting and marketing power from Grand Coulee as well as Bonneville.) Conversely, however, it established the principle that Bonneville cannot generate
