Nonfirm Energy and BPA's Industrial Customers

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A power system's purpose is to meet electric loads. For most loads in the United States, this purpose is achieved by building generating resources to provide "firm" power. Firm power is power intended to be available continuously, or power whose availability can be assured. The rule is that a system plans to have, and is obligated to have, enough firm power to meet all its loads.

The chief exception, regionally and nationally, is twenty-five percent of the load of the direct-service industrial ("DSI") customers of the Bonneville Power Administration ("BPA"). Instead of planning firm power generating resources to serve this portion of the DSI load (the DSI "top quartile" or "first quartile"), BPA uses a combination of two other resources: nonfirm energy, availability of which is not assured, and firm

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1. **Bonneville Power Administration, BPA Definitions** 29 (June 1981) [hereinafter cited as BPA Definitions].
2. To provide reliable firm power service, power systems must also maintain reserves, i.e., sources of power that can be drawn upon to protect service during periods of shortage or equipment failure. See Cohen, Efficiency and Competition in the Electric-Power Industry, 88 Yale L.J. 1511, 1514-15 (1979). See also 16 U.S.C. § 839a(17) (Supp. V 1981) (defining BPA "reserves").
3. Currently 14 DSIs operate some 18 facilities in the Northwest which produce or process about 30% of the nation's primary aluminum, all of the nation's domestically-mined nickel, and substantial quantities of other metals and chemicals. The term "direct-service" reflects that these companies buy their power directly from BPA (which is otherwise a wholesale supplier) rather than from a utility. Pacific Northwest Electric Power Supply and Conservation Act: Hearings on S. 2080 Before the Senate Comm. on Energy and Natural Resources, 95th Cong., 2d Sess. 92-93 (1978) (statement of Gordon C. Culp, counsel, Pacific Northwest Utilities Conference Committee).
energy "borrowed" from future time periods at the DSI's risk.\(^5\) This "combination service" makes the DSI top quartile unique, both operationally and legally.\(^6\)

There are several reasons why BPA uses combination service rather than firm power service to meet the DSI top quartile demand: (1) if properly designed, combination service can provide adequate power quality for this portion of the DSI demand; (2) environmental impacts and costs to non-DSI consumers would be greater if firm resources, planned and installed for other loads, were increased by the amount of the DSI top quartile;\(^7\) and (3) although combination service imposes costs on the DSIs in the form of periodic interruptions, it saves money for all BPA customers by permitting BPA to take advantage of certain physical features of the Columbia River power system that would otherwise impede rather than facilitate efficiency.

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5. See infra note 27.

6. Although the concept of a DSI "top quartile load" is used for simplicity throughout this paper, in fact each DSI's load is indivisible; i.e., there are no distinct "top quartile" facilities, employees, or products. The DSI "quartiles" are actually portions of each DSI's contract demand for Industrial Firm Power from BPA, rather than discrete segments of load. See, e.g., Final Action Concerning Power Sales and Residential Exchange Contracts Required by Pacific Northwest Electric Power, Planning and Conservation Act, 46 Fed. Reg. 44,340, 44,379 (1981) (prototype power sales contract, Attachment 2) [hereinafter cited as 1981 DSI Contracts].

7. This amount would be equivalent to an additional nuclear power plant. DSI contract demands currently total some 3600 megawatts. The top quartile is thus about 900 megawatts. To provide this energy on a firm basis would require the equivalent of a 1200 megawatt nuclear power plant (such as Washington Public Power Supply System Nuclear Project No. 1) operated at a 75% plant factor. As the Administrator of BPA explained to a Congressional committee in 1980:

First, as you know, the DSI's receive a mixture of firm and nonfirm power, unlike other BPA customers. Half the energy and all of the capacity associated with the DSI loads may be interrupted or withdrawn by BPA under certain circumstances to meet the firm power needs of other customers. . . . As a result, only about half the DSI power could even theoretically be used by utilities for serving the loads of other types of customers, including load growth. The other nonfirm half of the DSI load represents reserves that the region would have to carry in some form in any event. In the absence of the DSIs, it might be difficult for BPA and the region to earn equivalent revenues from the sale of this reserve capacity and energy. Thus, while the DSI firm load represents roughly 1.7 large new conventional power plants, the fact that the DSI power is nonfirm saves the region the need for another 1.7 conventional power plants of the same size (or their equivalent). This is one reason why from a rate impact standpoint, it is beneficial for other consumers that the DSIs are part of the regional power system in the Northwest.


The statement cited refers also to the DSI second quartile, service to which is not discussed here. BPA plans firm power resources to support service to the DSI second quartile, but retains rights to interrupt delivery of power to the second quartile that render such service "nonfirm" in the sense used above.

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These policy reasons are simple; the operational details of combination service are not. Because combination service is complex it is poorly understood, and the cost savings it provides the Northwest are in danger of being lost. This article attempts to explain combination service, its operational mechanics and policy justifications, its historical evolution and its new statutory basis. The article has four basic sections:

(1) An operational and policy explanation focusing on the physical features of the BPA system that make combination service efficient and permit BPA to use a form of "average water" planning rather than "critical water" planning not just to make rates but also to meet loads. This section includes analysis of nonfirm energy and its uses, as well as analysis of reservoir operating techniques that "borrow" DSI firm energy from future periods for current use.

(2) An historical explanation, showing the evolution of DSI service and the problems encountered under the DSI contracts of the 1960's and early 1970's. While BPA has long used forms of combination service for some portion of the loads of some DSIs, other DSIs formerly enjoyed firm service for their entire loads. Only with the Industrial Firm contracts of 1975 did BPA develop the concept of quartiles, a uniform industrial sales policy, and a clear form of combination service.

(3) A legislative explanation, showing how Congress in 1980 continued and refined the form of combination service provided to the DSI top quartile; how this form of combination service deals with problems encountered under earlier contracts; and how combination service is now integrated into statutory provisions governing not just BPA power supply obligations, but all BPA rates.

(4) A discussion of recent litigation, examining briefly the recent decision in Central Lincoln Peoples' Utility District v. Johnson ("Central Lincoln I"), which deals directly with BPA's use of nonfirm energy for service to the DSIs.

8. Under pure "critical water" planning concepts, BPA would plan to serve, and to recover all its costs from, only those loads that could be met with the power produced under the lowest or near-lowest streamflow conditions on historical record. The DSI top quartile service explained in this article permits BPA to plan instead on serving and collecting revenue from a larger total load, i.e., a load that can be met when streamflows exceed "critical" and approach average levels. Under average streamflow conditions, as explained below, BPA can meet all its loads including the DSI top quartile, at least if all power is used first to meet loads and not diverted to other purposes until all loads are met.

I. NONFIRM ENERGY AND RELATED RESERVOIR OPERATIONS

A. Nonfirm Energy and Features of the Hydro System

Nonfirm energy is energy that is not continuously available or energy whose availability cannot be assured. Its availability cannot be assured on a hydroelectric system such as the BPA's because a hydro system uses water for fuel. Historical records tell planners the minimum ("critical") amount of water nature has provided in prior years. Planners calculate the firm energy which the system can produce by assuming that at least this critical amount of water will be available in each future year. Firm energy is thus the energy that can be produced under critical water conditions. Nonfirm energy is energy produced from "extra" water when nature makes it available. It is often described technically as energy produced on a hydro system by above-critical water conditions.

Nonfirm energy is unavailable when streamflows approximate the lowest or near-lowest volumes recorded for a period of similar duration—the circumstance in which streamflow or runoff is said to be critical. Under
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critical conditions, all hydro energy is firm energy, not nonfirm energy.13 Because streamflows have other power and nonpower uses, nonfirm energy may not be available even when streamflows exceed critical. But when nonfirm energy is available at all it tends to be available in substantial quantities; it has a feast or famine (deluge or drought?) pattern of availability, particularly from season to season but also from year to year.

BPA’s nonfirm energy production and sales policies reflect six basic physical facts of the region’s hydroelectric system:

(1) Variations in annual streamflows are immense. On the Cumbia River System, the highest recorded annual flows greatly exceed average flows, and average flows greatly exceed critical flows.14 Moreover, annual runoff volume during the BPA system’s July 1–June 30 operating year is entirely random and cannot be predicted until the January snowpack survey15 at the earliest. This means the operating year is already half over by the time planners can intelligently guess whether the year will produce critical, average, or abundant streamflows. The potential for large but unpredictable flows above critical means that unless markets can be found for large but nondependable quantities of nonfirm energy, water will often be wasted, revenues lost, and all BPA rates increased unnecessarily.16

(2) On BPA’s system, seasonal flow variation is also immense. Seasonal variations in snow, rain, and runoff are typical of hydro systems. But on the Columbia River, the runoff peaks in late spring and summer, the “wrong” time in relation to the region’s demand for power, which peaks in winter.17 Thus, nonfirm energy is almost never available

13. Firm energy, in fact, is defined as the energy the system is capable of producing under critical water conditions. See supra note 1 and accompanying text.
14. Minimum annual runoff volume on the Columbia is 78 million acre feet (MAF), average is 135 MAF, and maximum is 193 MAF. DEIS, supra note 11, Appendix A, at II-12; Columbia River Water Management Group, Depletions Task Force, Adjusted Streamflow and Storage 1928–1978 (Oct. 1981) (copy on file with the Washington Law Review). (Like those in the latter paper, the numbers in the DEIS represent thousands of cubic feet per second, but are labeled incorrectly; converted to MAF they yield the figures in this footnote.)
15. At the beginning of each month, January through June, Northwest reservoir operators prepare forecasts of each reservoir’s refill probability based on spring runoff and other available climatological data. The principal snowpack survey for the BPA system is that undertaken by the U.S. Soil Conservation Service, whose first report is generally available on January 10. In most years, little of the Columbia River Basin’s annual precipitation accumulates as snowpack prior to January. For the relationship between the volume runoff forecasts and development of the “variable energy content curve” on which nonfirm energy sales are based, see DEIS, supra note 11, Appendix A, at II-40.
16. The revenue BPA expects to collect from nonfirm energy sales under average water conditions is used to reduce prospectively the rates it sets for firm power. Put another way, in setting rates BPA spreads part of its costs over the total sales it expects to make under average rather than critical water conditions. See, e.g., Bonneville Power Administration, Summary Rate Design Study (Feb. 1981), reprinted in 1 RATES RECORD, supra note 7, at 320–22.
17. On average, natural runoff on the Columbia River is about five times as great in June as in
in fall and early winter.\textsuperscript{18} If generated solely in response to natural streamflows, nonfirm energy would rarely be available until late spring or early summer, when it would often be too abundant to be used completely. If the system serves a year-round load in part with nonfirm energy, it must therefore serve the load with other energy in the fall and early winter. For the system to maximize efficiency and minimize spilled water,\textsuperscript{19} it must also (a) operate its storage reservoirs to capture and hold as much of the natural streamflow as possible,\textsuperscript{20} and (b) rely on snowpack surveys to predict future runoff so that generation of nonfirm energy can begin even before the natural runoff arrives, thus creating storage space in reservoirs and lengthening the portion of the year during which nonfirm energy is available.\textsuperscript{21}

(3) Storage capacity on the Columbia is small in relation to average runoff. On the Colorado River system, for example, there is reservoir storage capacity for 386\% of the average annual streamflow.\textsuperscript{22} This permits runoff to be "smoothed out." No water is spilled and, more important, all water available for power production can be used to produce firm power. On the Columbia storage is only about thirty percent of average annual streamflow.\textsuperscript{23} While even this limited storage increases BPA’s firm power capability, flows often remain uncontrolled, producing nonfirm energy that saturates all markets and forcing some water to spill. Techniques that increase effective storage capacity thus reduce spills and increase efficiency.\textsuperscript{24}

(4) Northwest streamflows above critical are used for purposes besides power and for power purposes besides nonfirm. Fish passage, recreation, flood control, navigation and irrigation all limit power generation.\textsuperscript{25} And

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\textsuperscript{18} December, nearly two-thirds of the average annual runoff occurs in the four-month period of April through July. L. Dean, Understanding Hydroelectric Power System Critical Periods 5 & table I (Feb. 1982) (paper prepared for the Bonneville Power Administration) (copy on file with the Washington Law Review). The lowest recorded daily flow (35,000 cubic feet per second ("cfs")) occurred on January 12, 1937; the highest daily flow (1,240,000 cfs) was nearly 3600\% greater, and occurred on June 4, 1894. INTERNATIONAL COLUMBIA RIVER ENGINEER BOARD, WATER RESOURCES OF THE COLUMBIA RIVER BASIN 53-57 (1959). Primarily because of heating loads, regional demand peaks in mid-January when streamflow is at its lowest. DEIS, supra note 11, Appendix A, at II-36, figure II-4.

\textsuperscript{19} For an explanation of the "spilled water" concept, see infra part ICI.

\textsuperscript{20} See infra notes 22-24 and accompanying text.

\textsuperscript{21} DEIS, supra note 11, Appendix A, at II-40.

\textsuperscript{22} Id. Appendix A, at II-12.

\textsuperscript{23} L. Dean, supra note 17, at 9. Until 1970, Columbia River storage was less than half this amount. Id.

\textsuperscript{24} The rules of reservoir operation for production of firm power "frequently restrict the ability . . . to produce nonfirm energy" and "there is a high probability that water will be spilled." DEIS, supra note 11, Appendix A, at II-42, II-43.

\textsuperscript{25} For example, a new fish and wildlife program for the Columbia River and its tributaries is
regardless of runoff volumes, water available for power generation is used first to maintain reservoirs at levels sufficient to meet the system’s future firm load and, if possible, to refill the reservoirs. In addition, when nonfirm energy is finally produced, it has two distinct uses: to serve directly a load that lacks a source of firm power or to substitute for (“displace”) firm power already being used to serve another load. Thus, the actual availability of nonfirm energy, unlike firm energy, for any particular use cannot be determined more than a few months in advance, and then only in the spring.

(5) The use of nonfirm energy directly in the DSI load without a firm power resource installed for backup depends on, and is necessary to make possible, the “borrowing” of DSI firm energy from future time periods. This borrowing is performed by drafting reservoirs deeply in the fall and winter, thus producing firm energy from water that would otherwise be held to produce firm energy in a later season or year, a technique that in most years reduces spills by increasing the storage space available in reservoirs prior to the spring runoff. In combination with nonfirm energy available in other seasons, these firm energy borrowing techniques used in the fall and winter can maintain nearly continuous service to the DSI top quartile and can substantially reduce spills caused by lack of storage capacity. The interdependence of DSI nonfirm energy and borrowed firm energy in serving the DSI top quartile is often overlooked; use of each makes use of the other necessary and possible.

(6) The efficiency of Northwest hydropower operations depends in part on the size of the region’s nighttime load. Because of environmental constraints, river flow cannot be shut off during hours when demand for

expected to reduce firm power capability by an average of some 550 megawatts, an amount roughly equivalent to the output of one unit at the Centralia, Washington coal plant. NORTHWEST POWER PLANNING COUNCIL, FISH AND WILDLIFE PROGRAM § 304(a)(4), at 3-6 (Nov. 15, 1982).

26. The first (power) use of water is to restore reservoirs; nonfirm energy is generated if reservoir levels are above the level needed to assure future service to firm loads. Coordination Agreement, supra note 11, at § 9(h); DEIS, supra note 11, Appendix A, at II-12 to -13.

27. See infra notes 45-48 and accompanying text.

28. See, e.g., S. Rep. No. 272, 96th Cong., 1st Sess. 59 (1979) (projecting 96% average availability of power for total DSI load through use of such techniques in the absence of a regional firm energy deficit, equivalent to 84% average availability of power for DSI top quartile under such conditions).

29. The region could in theory develop other loads (e.g., boilers, irrigation, etc.) suited to direct use of nonfirm energy on a seasonal basis. This concept is being actively explored as a possible additional market for nonfirm energy during the spring and summer. See, e.g., Northwest Power Planning Council, Regional Retail Secondary Markets Background Memorandum (1982) (Staff paper) (copy on file with the Washington Law Review). But because a purely seasonal nonfirm load provides by definition no year-round firm load whose later curtailment can secure a “borrowing” of firm energy in the fall, it cannot make possible the reservoir operating techniques that reduce spills. See infra part ID.
power drops. The DSI load is large and operates around the clock. A large nighttime load permits minimum streamflows to be met with water that is used to generate power and earn revenue. The alternative methods of meeting minimum streamflow constraints would be to spill water at night or to further limit BPA’s daytime sales of peaking power (capacity) to utilities. BPA’s capacity sales help utilities avoid the need to install more generators in order to meet their peak loads, but such sales require BPA to accept return of energy from the utilities at night. This reduces the nighttime demand on BPA’s hydro system which conflicts with maintaining flows. Loss of nighttime load thus means loss of firm power and loss of revenues. The DSI top quartile represents a far greater proportion of the region’s nighttime than daytime load. If the top quartile is not served by day—that is, if neither nonfirm energy nor “borrowed” DSI firm energy is available for this purpose—it cannot be served at night, since the load cannot readily be switched on and off. If the top quartile is not served at night, the region will lose energy and revenues through

30. DEIS, supra note 11, Appendix C, at II-28:
   Except for the curtailment of nonfirm power, the load factor of [a DSI] plant might be 99 percent all year long. This high load factor service is extremely important to Bonneville because it enhances the ability to accept peaking return energy at night. Without the industry load, streamflow constraints would not allow Bonneville to sell as much peaking power as it now does.
   A brief example of BPA’s sales of peaking power and associated returns of energy may be helpful in understanding this point. A utility whose peak load exceeds the maximum output of its own power plants by 1000 kilowatts for one hour each day may obtain the extra capacity it needs by scheduling 1000 kilowatts from BPA for that peak hour only. During one or more off-peak hours, when the utility’s power plants exceed the utility’s loads, the utility can return the energy—1000 kilowatt-hours—to BPA. BPA uses this energy to serve its nighttime load and stores in reservoirs water it would otherwise have used to produce energy to meet that load. The utility has thus obtained 1000 kilowatts of added peaking power, and BPA has the same amount of energy available as it did before the transaction—provided it can accept the return energy while continuing to meet minimum streamflows.
   Loss of nighttime load may also require reduction in the nighttime power output of the region’s coal and nuclear plants. Such plants operate most efficiently, however, on a round-the-clock basis. Moreover, most of their costs are capital costs (not fuel costs) which continue and must be recovered whether the plants are operating or not. For this reason, a combined thermal and hydropower system operates most efficiently in pure economic terms when thermal plants operate around the clock to meet continuous loads and hydropower sources are shaped to follow fluctuating loads. See generally DEIS, supra note 11, at Part 1 II-7 to -17 (discussing BPA’s Hydro-Thermal Power Program).

31. See infra note 50.
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spills, increase thermal peaking capacity, operate existing thermal plants less efficiently, or all of these, just to meet remaining loads. Other nighttime loads also provide nighttime benefits but at the cost to the region of installing firm resources (new generators) for the daytime service of such loads. No such resources are installed for the daytime service of the DSI top quartile.

These six physical features of the regional power system have shaped BPA's nonfirm energy policies, reservoir operations, and DSI service. The DSI top quartile has evolved into a load served: (a) primarily with nonfirm energy, some of which would otherwise not be sold;34 (b) in part through firm energy borrowing techniques that reduce spills by increasing the system's effective reservoir storage capacity;35 (c) without firm power resources being planned or installed for this purpose;36 and (d) at night in a manner that helps the system meet environmental requirements without spilling water and losing revenue. Although these particular efficiencies cannot currently be achieved by other uses of nonfirm energy, nonfirm energy does have another use, discussed immediately below.

B. The Two Uses of Nonfirm Energy

Nonfirm energy has two basic uses, only one of which is discussed above. The second use is to displace (substitute for) the firm power output of a generating resource such as a coal plant or a combustion turbine. Initially, displacement may be physical (a generator planned for service to firm loads is shut down, and nonfirm energy is used to serve the load instead) or economic (the generator continues to operate, but the output is "displaced" and sold as nonfirm energy to another entity that has a generator it can shut down). Since some generator must be shut down for displacement to occur, all displacement is ultimately physical.37

34. Since under critical water conditions BPA cannot meet the total loads (full DSI load and net utility loads) it has contracted to serve, the DSI top quartile may also be described as an energy reserve from which power may be withdrawn to protect firm power customers from shortages, including shortages caused by critical water conditions. See, e.g., H.R. Rep. No. 976, Part II, 96th Cong., 2d Sess. 48 (1980).

35. DEIS, supra note 11, Appendix A, at II-43. See also supra note 24.

36. See supra note 7. See also DEIS, supra note 11, at Part II-9 ("BPA's sale of interruptible power to industry would provide a portion of the 'forced outage' reserves for the integrated hydrothermal system, without which additional generation would have to be built or imported from outside the region . . .").

37. Utilities sometimes buy BPA nonfirm energy to displace (substitute for) firm energy they planned to produce with their own dams or power plants but which cannot be produced because equipment is broken or because on their own hydro systems actual streamflow conditions may be worse than critical. Here too the planned firm energy production is physically displaced, although by God or nature rather than utility managers.
Before a generator can be physically shut down it must be installed. Thus the use of nonfirm energy to displace firm energy from a power plant avoids, during part of the year, the fuel costs and environmental impacts of operating the plant, but it avoids neither the cost nor the impacts of building the power plant in the first place. In other words, displacement reduces operating (variable) costs of meeting a load; it does not reduce capital (fixed) costs. Displacement does not reduce the number of power plants that must be installed to meet any given load, nor does it increase the load that may be served by any given power plants.

The other use of nonfirm energy is directly in load, without any generator having been installed for the purpose of supplying firm power to the load when nonfirm power is not available. This is the use of nonfirm energy in the DSI top quartile. It is a use virtually unique to BPA, and among BPA customers, unique to the DSIs. This use avoids both the variable and fixed costs of an additional power plant of sufficient size and capability to supply the load with firm power, as well as the environmental impact of that plant.

In reducing total costs for the region’s electrical consumers, displacement is a second-best use of nonfirm energy; the highest and best use is directly in load without a backup generator, since this is the only way to meet the region’s total load while avoiding the cost of installing additional generators. But minimizing the cost of meeting the region’s total load may not minimize the cost of meeting the load of a particular utility or DSI, which is why there is no “highest and best” use of nonfirm energy except from a regional perspective. For example:

(1) A utility that is building or already owns a displaceable generator wants to buy as much BPA nonfirm energy as possible for displacement purposes so that it can reduce its own operating costs; the utility’s management and customers may not particularly care whether this is the best use of nonfirm energy for the region, whether costs for BPA’s other utility customers increase, or whether loads dependent on nonfirm energy must be interrupted to make possible the utility’s cost savings.

(2) Similarly, a DSI that uses nonfirm energy directly in load would not be mollified by an explanation of the region’s highest and best use of nonfirm energy at the moment when delivery of that energy has just been interrupted. Part of the DSI load would then face the costly alternatives of nonfederal replacement energy, energy borrowed at the DSI’s risk from

38. The Idaho Power Company, alone among Northwest generating utilities, employs a variant of average rather than critical water planning on its own (unique) hydro system, and therefore does not guarantee availability of power to all customers under all circumstances.
39. See supra notes 7 & 36.
40. BPA acts as an agent for the DSIs in acquiring, at the risk and expense of the DSIs, “Indus-
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its own future service, or no energy at all; the DSI would prefer that the region bear the cost of meeting all its loads, not just its non-DSI loads, with firm rather than nonfirm energy.

In these circumstances, it might appear that BPA's utility and DSI customers could agree that the region should install enough power plants to meet its total load under critical water conditions, using nonfirm energy when available solely to displace operation of non-hydro power plants and reduce their variable costs. Planning of power plants on this basis would avoid periodic interruptions of the DSI load, and confine the use of nonfirm energy to displacement purposes. The utilities and DSIs in fact proposed something very close to this when drafting a regional power bill in 1977. Had that bill been enacted, combination service for the DSI top quartile would have been replaced with firm power obtained through installation of additional firm power resources.

BPA did not support this feature of the legislation drafted by utilities and DSIs. One reason was that the demise of combination service would have imposed costs in addition to the cost of additional power plants in the form of lost savings made possible by provisional reservoir drafts and reduction of unnecessary spills.

C. Spills and Provisional Reservoir Drafts


The system's reservoir storage capacity is a limiting physical feature. Spills and provisional reservoir drafts are respectively the consequence of, and a partial solution for, limited reservoir storage space.

Spill is the passage of water past a dam in a manner that does not produce power. For any given streamflow level, spill reduces both total power production and total revenue from nonfirm sales. Water is therefore not spilled when it can prudently be stored; fisheries operations, flood control, recreation and other constraints set the limits of prudence. When water must be released from reservoirs for non-power purposes, it is still not spilled if the release can be accomplished by directing water through turbines to generate power. Sometimes water must be spilled trial Replacement Energy" (IRE) which the DSIs sometimes buy from nonfederal sources (when available) for use during periods when BPA restricts delivery of certain BPA power. See 16 U.S.C. § 839(f)(i)(1) (Supp. V 1981) (authorizing BPA to so act).

41. See infra notes 45–52 and accompanying text.
42. See infra notes 99–101 and accompanying text.
43. The concept of combination service is explained in part I infra.
44. See infra part II B.
simply because its release becomes necessary at a time when all gen-

To reduce spills and increase useful storage capacity, BPA uses provi-
sional reservoir drafts—"premature" withdrawals of water that would
otherwise be kept in storage for future service to firm loads. Provision-

45 Provisional drafts are made in the fall. These drafts are called "provisional" because
the power they produce is sold with strings attached: provisional drafts
produce firm energy at a time when all firm loads are already being met;
they leave insufficient water in the reservoirs to meet future firm loads if
critical streamflow conditions ensue; therefore they must be accompanied
by techniques to "repay" the borrowed firm energy if it is later needed. 46

By drafting reservoirs earlier and more deeply, below the levels needed
to assure production of the firm power BPA will later require, provisional
drafts produce lower reservoir levels in the fall and winter—a "bigger
hole" to accommodate the spring runoff without spilling. On average, the
provisional drafts thus reduce spills, increase storage capacity and total
power production, and spread costs over more kilowatt-hours of sales
than would otherwise be possible. 47 This is an advantage for all power
consumers.

But there are also potential disadvantages for power consumers. A
deep hole in a reservoir is useful if the spring runoff turns out to be abun-
dant, but not if the runoff turns out to be small. The fundamental feature
of provisional drafts is that they borrow firm (not nonfirm) energy from
the future. Consumers depend on that firm energy being available later.
Although an average spring runoff will "repay" the borrowing—by re-
filling reservoirs to the levels needed to assure production of the system's
planned firm energy—critical or near-critical streamflows will not. Thus
provisional drafts involve risk. Moreover, this risk is incurred by drafting
reservoirs to produce additional firm energy at times when firm loads are
being met and do not need the added energy.

To gain the advantages of provisional drafts without these disadvan-
tages, the system needs both (1) a customer for the firm energy generated
by the provisional drafts, and (2) security for this "borrowing" of firm
energy, that is, a reliable source of firm energy available for "repay-

45. See generally DEIS, supra note 11, Appendix A, at II-42 to -48. See also 1 CONTRACT OFFI-
CIAL RECORDS, supra note 7, at 259-63 (explanation by BPA Power Manager of system benefits of
provisional drafts and related techniques).

46. 1 CONTRACT OFFICIAL RECORDS, supra note 7, at 259-63; Coordination Agreement, supra
note 11, § 9(n).

47. See 1 CONTRACT OFFICIAL RECORDS, supra note 7, at 259-63 (explanation by BPA Power
Manager of system benefits of provisional drafts and related techniques). See generally DEIS, supra
note 11, Appendix A, at II-42 to -48 (description of past provisional sales and future provisional
operation of reservoirs).
ment” purposes should nature fail to repay the borrowing with adequate streamflows. BPA’s use of DSI loads to meet this dual need is examined immediately below.\textsuperscript{48}

2. The DSIs as Customers for Borrowed Firm Energy

Long before the concept of “quartiles” originated, BPA recognized that if a portion of the DSI load were normally served with nonfirm rather than firm energy, that portion could provide a captive market for firm energy produced by provisional drafts. Provisional drafts produce energy in the fall and early winter, when nonfirm energy is usually not available; to the extent the DSI load relied on nonfirm energy, it would need and could accept other energy at that time.\textsuperscript{49}

There were two caveats:

(1) If the full DSI load (like all other BPA loads) were supported by BPA’s installed firm power resources on a year-round basis, the DSIs would have no need for the “extra” firm energy provisional drafts produce. As noted above, BPA therefore opposed the feature of the legislation drafted by utilities and DSIs that would have produced this result.

(2) Conversely, the DSI load could not operate on only a seasonal basis and still provide a market for the “extra” firm energy. The load would have to be in operation rather than shut down at the time provisional drafts were made; a cold potline (aluminum reduction facility) cannot be restarted quickly or cheaply.\textsuperscript{50} Whether the load was operating at the time

\textsuperscript{48} A topic beyond the scope of this article is the ability of Northwest utilities to serve as a market for, and to secure repayment of, borrowed firm energy. Some utilities own power plants whose operation borrowed firm energy could in theory displace. Fewer, however, can provide reliable repayment security to BPA. To produce the “extra” firm energy required for repayment during droughts, the utility must have generating capability in excess of that needed to meet its loads under critical water conditions; most utilities lack such generation, and none install it deliberately.

Even the “extra” energy capability of utility combustion turbines, see infra note 67,—the potential energy production of such turbines in excess of that produced in their planned peaking use—is not necessarily available to BPA as repayment security. The utility, not BPA, physically controls the turbine. Energy from a turbine not started up at an earlier point cannot later be made up. The utility or government agencies may resist the costs or environmental impacts of extra operation when the time comes for repayment (“burning oil to put water back in a reservoir” provokes resistance); fuel may prove unavailable; the turbine may not perform. Each of these problems has occurred in recent years.

\textsuperscript{49} The original 20-year provisional energy agreement between BPA and the DSIs was executed in 1954, and was “conceived by BPA during the development of the first Hungry Horse [project] operating plan.” DEIS, supra note 11, Appendix A, at II-43.

\textsuperscript{50} The difficulty is basically caused by the effects of cooling and reheating. Aluminum is produced in carbon-lined reduction cells known as “pots.” Each pot contains a molten chemical bath into which alumina is introduced and through which an electric current is passed. In the bath, the current electrolytically decomposes the alumina into aluminum and oxygen. Resistance to the current produces the heat necessary to keep the bath in a molten state, at about 970 degrees C. See generally
of the provisional draft would in turn depend largely on whether nonfirm energy had been continuously available to the load in the months since the prior year’s provisional draft had ended.

BPA could thus use a portion of the DSI load as a captive market for both nonfirm energy and the firm energy produced by provisional drafts, but only if this portion of the DSI load were denied by contract the right to receive the type of firm power service enjoyed by all other BPA customers, and only if a combination of power sources other than planned firm resources proved sufficient to keep the load in operation.

3. Other Portions of DSI Load as Repayment Security

The DSI top quartile—otherwise served with nonfirm energy—thus became a market for borrowed firm energy. But the top quartile cannot, through curtailment, repay borrowed firm energy. Under the critical water conditions that require repayment, service to the top quartile has already been cut off. To “free up” firm energy by withdrawing power from a load, BPA must interrupt a load normally served by firm resources, that is, a load not otherwise subject to restriction because of critical water levels. Thus the DSI second quartile, and now the third, have become the security for repayment of borrowed energy that is marketed to the DSI first quartile; it provides reliable security because BPA can physically cut off the load if a DSI does not curtail on a schedule BPA approves.51 By reducing the DSI load in this manner—up to fifty percent of DSI demand if necessary—BPA can ensure that its remaining firm energy is sufficient to meet its non-DSI loads.

The result of using another part of the DSI load to secure the borrowing of firm energy used to serve the DSI top quartile is that the borrowed firm energy is actually borrowed from the DSIs themselves. It is firm energy that would otherwise be reserved, and held as water in reservoirs, for the


When the electric current is cut off, the molten bath cools and will ultimately “freeze” permanently into a solid mass unless removed. During brief interruptions of power for only part of the DSI load, the remaining power may be switched repeatedly from one series of pots (a “potline”) to another in an attempt to slow the loss of heat. A prolonged interruption requires one or more potlines to be taken out of service, however, which unavoidably damages the individual pots. Restoring an idle potline to service is a lengthy (up to three months) and expensive (more than $1,000,000) process during which the individual pots must essentially be rebuilt and then reheated. During reheating some of the carbon pot linings (cathodes) fail; those pots must then be taken out of service and again rebuilt before their production is restored.

51. See S. REP. No. 272, 96th Cong., 1st Sess. 59 (1979), relevant portion set forth in text accompanying note 123 infra. Under the BPA-DSI contracts executed in 1981, 1981 DSI contracts. supra note 6, the basic firm energy borrowing and repayment provisions are found in contract sections 8(a) through (d) and 7(e).
Nonfirm Energy

future firm service of the DSI second or third quartiles. If streamflows are sufficient to restore reservoirs to critical levels, the DSI second or third quartiles will be served with firm energy as planned even though the top quartile will not be served with the nonfirm energy on which it depends unless streamflows are also sufficient to fill reservoirs above critical levels. If streamflows do not restore reservoirs to at least the critical levels, however, not only the DSI top quartile but also the second or third quartile is exposed to interruption so that BPA’s other firm loads may be served.

Thus it is the future firm service of the DSIs themselves, not of other loads, that provisional drafts jeopardize. The water that remains in reservoirs after a provisional draft is sufficient to meet the future firm energy needs of non-DSI customers even if critical streamflow conditions ensue. This permits BPA to gain for all customers the benefits that provisional drafts make possible, while simultaneously protecting its non-DSI customers from the risks those drafts entail. The shifting of those risks exclusively to the DSIs has, however, created conflict between BPA and the DSIs.

D. Combination Service—The Generic Concept

Combination service to a portion of the DSI load is not complex as a generic concept: it is the sequential use of (1) nonfirm energy, and (2) borrowed DSI firm energy to serve a large load that would otherwise require firm power resources to be planned and installed. The concept predates BPA’s invention of “quartiles,” but is most easily described in terms of quartiles.

BPA uses nonfirm energy to serve the top quartile initially. If, for example, the January snowpack survey indicates that annual runoff will exceed amounts needed to refill reservoirs, BPA begins serving the top quartile with nonfirm energy at that time. Later in the year, when the nonfirm energy is no longer available, BPA begins using borrowed DSI

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52. See supra note 38; 1981 DSI Contract, supra note 6, § 8(a); DEIS, supra note 11, Appendix A, at II-42 to -43.
53. See infra text accompanying notes 62–66.
54. See infra part II.
56. Firm energy not capable of being shaped to meet firm loads (hence “secondary firm” energy in the original sense, see supra note 12) is also available to BPA in most years between July and September. BPA used this “pre-Critical Period” firm energy to serve the DSI top quartile for two
firm energy to continue serving the top quartile, retaining sufficient firm energy to meet, under critical water conditions, all BPA loads other than two quartiles of DSI load. The transition must be accomplished while the load associated with the top quartile of DSI demand is still operating, since the load cannot be restarted quickly once deliveries stop.

Ideally, service with borrowed DSI firm energy continues until the future availability of nonfirm energy can be predicted with relative accuracy; in other words, until the January snowpack survey. At this point the borrowing stops, regardless of what the survey shows. But if the snowpack survey indicates that nonfirm energy can again be made available, deliveries of nonfirm energy resume. If nonfirm energy cannot be made available, BPA service to the DSI top quartile is interrupted, but the previously borrowed firm energy is not recalled immediately from the DSI second or third quartiles. The second or third quartile will be interrupted for power purposes only if later surveys and actual runoff show that because of the provisional drafts, BPA will lack sufficient firm energy to meet its non-DSI loads.

The hope, of course, is that the spring runoff will exceed critical, at least to the extent of filling that portion of the "hole" created by the provisional drafts of the previous fall. If streamflow restores reservoirs to critical elevations—the elevations that would have been maintained in the absence of the provisional drafts—BPA's ability to meet future firm loads, including three quartiles of the DSI load, is again assured. Refill of reservoirs to this level thus discharges the obligation to repay the borrowed energy; through the combination of the provisional draft and the above-critical streamflow, extra firm energy has been produced, marketed and paid for.

If snowpack and natural streamflow are even better, as is normally the case, reservoirs are refilled completely and nonfirm energy again is gener-

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57. BPA retains its rights to interrupt the DSI top quartile for the purpose of providing reserve protection to BPA's other firm power customers even during periods when BPA is serving the top quartile with firm energy. See, e.g., 1981 DSI Contract, supra note 6, § 8(a)(3)(B)(ii); 1981–82 Operating Agreement, supra note 55, at 3.

58. 1981 DSI Contract, supra note 6, § 8(a)(4)(E). This limitation applies to the borrowing of DSI firm energy from future years only, not to borrowings within a single operating year.

59. 1981 DSI Contract, supra note 6, § 8(c)(8).
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ated. Because of the provisional drafts, less water will have been spilled and more nonfirm power will have been produced, marketed and paid for.

Thus nonfirm energy and borrowed firm energy are combined to serve a large load while avoiding installation of an additional firm power resource. The combination also makes possible operational efficiencies that independently reduce costs for all BPA customers. Neither nonfirm energy nor borrowed firm energy alone could produce any of these results: what makes either type of energy usable for serving loads has always been and will remain its use in conjunction with the other component of combination service. This bears emphasis because historically the greatest danger to combination service has never been a conscious decision to abandon it. Rather, the danger lies in failing even to recognize that a combination is involved, and that this service cannot be maintained if availability of either component is eroded.

F. Some Implications of Combination Service

Neither nonfirm energy alone nor the firm energy borrowed through provisional drafts can prevent top quartile interruptions, because neither form of energy is available year round. But when combined, these two sources of energy can usually keep the entire DSI load operating until the time when curtailment of fifty percent of the DSI load will leave just enough firm energy to meet BPA's remaining firm loads.

The early production of nonfirm energy based on snowpack surveys and the delayed return of borrowed firm energy increases the chance that the full DSI load will be operating and able to accept borrowed firm energy when provisional drafts are made; this in turn increases the chance that the load will be operating when nonfirm energy is available and water cannot be stored. Within the system's operating constraints, spills and installed firm resources are minimized, while total sales and total load served are maximized.

For BPA, the virtues of combination service are that:

1. the planning and installation of firm resources to serve a load of some 900 megawatts can be avoided, because combination service can provide an adequate quantity of power for that part of the DSI load;

2. all BPA customers benefit in the form of lower rates from the reduced spills, added sales, and extra revenues that provisional drafts and an extra market for nonfirm energy make possible;

60. See infra part III.
61. Put another way, BPA can serve 900 more megawatts of load than its firm resources would otherwise support.
(3) the DSIs bear the risk of the provisional drafts, and BPA’s firm energy available for other customers is not affected, since the energy borrowed is future DSI firm energy; and

(4) the efficiency made possible by a large nighttime load is achieved.\(^{62}\)

But because the benefits of combination service do not follow the risks, the DSIs have never been enchanted with combination service. In fact, this is putting it mildly. As described in more detail below, the history of combination service is one of:

(1) BPA efforts to perfect a form of combination service that can avoid the need to plan firm resources for up to twenty-five percent of the DSI load;

(2) DSI efforts to obtain (or retain) service with BPA firm resources, especially at times when combination service has not appeared to be an adequate substitute; and

(3) efforts by certain utilities, some federal agencies and some non-power groups to achieve other power or nonpower purposes that happen to erode combination service, generally without any stated recognition that combination service benefits all BPA customers.

There are ironies here, and the ironies have significance because power policy is public policy, and increasingly a matter of public discussion and debate. Because BPA’s hydro system operations are complex, combination service is also complex; its purposes and impacts are easily misunderstood and misrepresented. BPA’s traditional image has not been that of an agency determined to limit installation of firm power resources. The DSIs, although they are the only customers to whom BPA denies 100% firm power, are nonetheless likely to be portrayed as benefitting from this less-than-firm service. In these circumstances, BPA’s attempts to maintain a reasonable availability of nonfirm and borrowed firm energy for the top quartile is apt to be interpreted as solicitude for the DSIs rather than as a saving for BPA’s non-DSI customers.\(^{63}\)

\(^{62}\) See supra notes 31–32 and accompanying text.

\(^{63}\) The difference in perspective is a classic example of an old conundrum: is the top quartile’s “glass” half-full or half empty? Critics of the combination service techniques tend to view BPA as making herculean efforts to fill the glass, rather than as saving money for non-DSI customers by denying the DSIs a full glass to begin with. The DSIs, by contrast, are typically more concerned that other BPA customers have full glasses and the DSIs do not:

If a less costly (hence more valuable) method of providing reserves can be found, the DSIs would be very pleased. The DSIs would obviously prefer to receive 100 percent firm power and not be subject to interruption for the purpose of providing power system reserves. At no time has the payment from Bonneville for interruptions come close to compensating the DSIs for the costs that such interruptions impose.
Nonfirm Energy

Regardless of popular perceptions, the goal of minimizing the firm power resources needed to carry the total regional load provides the only explanation for BPA policies that might otherwise seem obscure or wrongheaded. Nothing else, for example, can explain BPA's longstanding opposition to firm power resources being installed for the DSI top quartile. Only with combination service can adequate top quartile service be provided without an installed firm power resource. If a firm resource were installed for this purpose, combination service would no longer be usable; combination service depends on one portion of a load not being supported by installed firm resources, and another portion of that load being subject to restriction notwithstanding its support by installed firm resources. Installation of an additional firm power resource would reduce DSI power interruptions, but total sales of nonfirm energy would be reduced, spillage would increase, the ratio of in-region sales to regional exports would decrease, and the full quantity of energy from provisional drafts could not be marketed or secured with equivalent reliability and planning certainty—all because combination service would no longer be possible.

Similarly, once BPA decided to oppose installation of firm power resources for the DSI top quartile, it tentatively refused to permit DSIs to own firm resources for use in "firming up" the nonfirm energy supplied the top quartile. DSI-owned resources would not directly reduce BPA's sales of nonfirm energy to the DSIs, but they could jeopardize a DSI's willingness to submit to the forced borrowing of its own firm energy. Rather than risk future interruption of half its power by borrowing firm energy when nonfirm energy is not available, a DSI might prefer some combination of load curtailment and use of backup generators. At the very least, DSI bargaining power on the terms and conditions of borrowing and repayment would be increased. Thus, adequate DSI power quality achieved without added investment and with lower total costs and the additional benefits of combination service are what BPA believed DSI-owned resources might jeopardize.


64. See infra note 66 and accompanying text.
65. This would occur because substitution of firm for nonfirm energy in the DSI top quartile would increase the quantity of nonfirm energy available to California and other Southwest markets without increasing total energy sales in the Northwest.
G. Summary

Either of nonfirm energy's two uses—for displacement, or directly in load—reduces costs for all BPA customers, and for reasons independent of the fact that water is free and nonfirm energy sales thus produce added revenue without any added fuel cost. Displacement avoids certain costs of operating generators otherwise needed to meet firm loads. Use of nonfirm energy directly in load without a backup generator avoids both the operating and capital costs of a generator that would otherwise be needed to carry the same load. Because nonfirm energy is usable in a year-round load only in combination with other energy, its use in load also permits other energy to be produced through reservoir operations that further reduce costs for all BPA customers.

Much attention has been devoted to the possibility of serving firm load growth by combining nonfirm energy with seasonal operation of a backup generator. Depending on operating and capital costs and BPA's nonfirm energy rate, this might cost less than meeting that same growth with a more conventional firm power resource such as a coal or nuclear plant. But from a regional standpoint, it is cheaper still to meet an equivalent amount of load with nonfirm energy for which no additional firm power resource is installed at all, even as a backup. For this reason, use of nonfirm energy directly in load without backup generation will remain the region's highest and best use of nonfirm energy for any given total system load.

The challenge has always been to combine nonfirm energy with special operating techniques to make the combined commodity usable in load. By so doing, the highest and best use becomes higher and better—if the combination can be maintained. The inability to maintain this combination when nonfirm energy is used first for other purposes is a cost, often unrecognized, of those other purposes. As shown below, this interdependence was very much on the minds of BPA planners during the lengthy legislative process that ended in 1980 with enactment of the Pacific

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67. For example, backup generation could be supplied by a "combustion turbine." Combustion turbines burn gas or oil to produce hot combustion gases that drive turbines and generate electricity. Although turbines are inefficient from the standpoint of fuel conversion efficiency, use nonrenewable fuel, cause pollution and noise problems, and have relatively high operating costs (depending on the price of gas or oil), they have relatively low capital costs and can be installed quite quickly. Few combustion turbines have traditionally been installed in the Northwest, compared with other regions; most of these are operated primarily to meet peak loads. See generally DEIS, supra note 11, Part 1, at V-104 to -107. Note that using a turbine to "firm up" nonfirm energy is the same as displacing operation of the turbine with nonfirm energy when available for this purpose.
Northwest Electric Power Planning and Conservation Act (Northwest Power Act). 68

A final general point: from a power supply standpoint, it would of course be cheaper for the system not to carry some of the region’s load at all. In other words, it may be cheapest to meet load growth by dropping service to an equivalent amount of existing load. In fact, dropping a load served by a firm resource is cheapest of all. It would be cheaper to drop twenty-five percent of Seattle’s load, for example, or twenty-five percent of the load of Pacific Power & Light, than to drop an equivalent part of the DSI top quartile; the Seattle and PP&L loads are supported by firm power resources that are already installed and capable of meeting firm load growth, even without added backup generators. The objective, however, is not to save money by failing to meet the system’s load, but rather to save money while meeting that load.

II. TOP QUARTILE SERVICE PRIOR TO THE NORTHWEST POWER ACT

A. Service Prior to the Modified Firm (MF) Contracts

DSI service prior to 1975 defies simple analysis in contemporary terms, because until 1975 there was no concept of “quartiles” in BPA’s industrial contracts. The quality of power varied among DSIs, depending on the power and transmission facilities available to BPA when each contract was signed. During certain years, BPA sold large quantities of ‘‘interruptible’’ power to some of the industries. Almost from the outset, borrowed firm energy from provisional drafts was used in combination with these nonfirm energy sales.

Some DSIs began with contracts for 100% firm energy, however, and others obtained such contracts. Until the late 1960’s, the general intent of BPA and the DSIs was to firm up the entire industrial load eventually. 69 The lack of a single, coherent industrial sales policy was first addressed during the 1960’s in the Modified Firm (MF) contracts, but was overcome only in the Industrial Firm (IF) contracts of 1975.

B. The Modified Firm (MF) Contracts

The Modified Firm (MF) contracts were twenty-year DSI contracts executed between 1961 and 1971. The MF contracts are not uniform be-

69. See, e.g., DEIS, supra note 11, Appendix A, at II-7.
cause during this decade BPA's industrial sales policies were evolving. The Modified Firm energy provided under most MF contracts was entirely firm. Most MF contracts provided each DSI an amount of power roughly equivalent to only seventy-five percent of its total load, however, thus incorporating a conceptual precursor of quartiles. But some DSIs received MF contracts for up to 100% of their total demand, while some received lower percentages.

Generally, any portion of DSI load not served with Modified Firm power was provided combination service with (1) nonfirm, or "interruptible," energy, and (2) borrowed DSI firm energy, called Provisional Energy. The latter energy, from provisional drafts, was provided under a separate Provisional Energy Agreement.

Thus, under the MF contracts the combination of nonfirm energy with provisional drafts—traditional for some DSIs—was continued, refined and made more uniform, with combination service for twenty-five percent of each DSI's demand as BPA's goal. Nonfirm energy was never relied on as the exclusive source of BPA power for any portion of DSI demand. But it may seem curious today that BPA and the DSIs, who previously intended to firm up the full DSI load when resources permitted, deliberately chose combination service instead. The explanation has three parts:

(1) Combination service and its benefits to other BPA customers were what Bernard Goldhammer, then BPA's power manager, devised and wanted, primarily to increase the total load BPA could serve and maximize BPA's total sales and hence revenues.

(2) The projected availability of energy to DSIs through combination service was very high. Infrequent and brief interruptions seemed more likely than frequent and lengthy ones. Regardless of BPA's sales priorities for nonfirm energy, none of it would be diverted to the Southwest before DSI loads were served, and very little could even theoretically be diverted to Northwest utilities for displacement purposes, because those utilities owned little displaceable generation at that time. The availability of borrowed DSI firm energy was expected to be high because the Provisional Energy Agreement contemplated very substantial provisional

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70. For description of this agreement and operations under it, see DEIS, supra note 11, Appendix A, at II-43 to -45.

drafts, and repayment of the borrowed energy was to be postponed until
the last possible moment in the hope that nature would instead restore
reservoirs with abundant streamflows.\textsuperscript{72}

(3) Compared to present conditions, non-federal replacement energy
was more frequently available to the DSIs, and at costs quite close to the
BPA rate.\textsuperscript{73} Thus, if interruptions of DSI power occurred, the likelihood
was great that reasonably priced replacement power would be available.

Under these circumstances, combination service seemed likely to pro-
duce substantial cost savings for BPA customers generally without im-
posing unacceptable costs on the DSIs specifically.

\textbf{C. The Industrial Firm (IF) Contracts}

The Industrial Firm (IF) contracts of 1975 were never executed except
on an "interim" basis, but they became the contracts under which BPA
and the DSIs operated, month-to-month, for nearly seven years.\textsuperscript{74} They
were intended to supersede the MF contracts as part of Phase 2 of the
Hydro-Thermal Power Program. Because they were written simultane-
ously, and reflected a single industrial sales policy, the IF contracts were
virtually uniform among DSIs.

The IF contracts were novel in many respects.\textsuperscript{75} But for present pur-
poses their distinctive features were:

(1) Unlike the MF contracts, the IF contracts provided service to each
DSI’s entire load—not just seventy-five percent of that load—with a sin-
gle, integrated class (or grade) of power known as “Industrial Firm
Power.” The amount of power necessary to meet each DSI’s full load,

\textsuperscript{72} See DEIS, supra note 11, Appendix A, at II-44.

\textsuperscript{73} See, e.g., Periods of Restriction and Sources of Replacement, 16 Rates Record, supra note
7, at 9098 (cost statistics).

\textsuperscript{74} One IF contract (that of Alumax Pacific Corporation) was executed by both parties. The
others were not executed, primarily because court orders prevented BPA from doing so until comple-
tion of an EIS on “Phase 2” of the Hydro-Thermal Power Program, of which the IF contracts were
intended to have been part. Port of Astoria v. Hodel, 595 F.2d 487 (9th Cir. 1979); NRDC v. Hodel,
455 F. Supp. 590 (D. Or. 1977), aff’d, 626 F.2d 134 (9th Cir. 1980). By “interim letter agreements”
signed in early 1975, BPA and the DSIs agreed to operate in accordance with the IF contracts until
cancellation by either party, an event the interim letter agreements permitted upon 30 days’ notice by
either party. For a description of the IF contracts, and Phase 2 and how it “stalled,” see DEIS, supra
note 11, Part 1, at II-13 to -17.

\textsuperscript{75} For example the IF contracts permitted BPA for the first time to protect its firm utility loads
by withdrawing large quantities of power from that portion of the DSI load supported by firm power
resources, and to do so for reasons (e.g., delayed completion of thermal power plants) other than the
"recapture" of previously borrowed DSI firm energy. The “energy planning reserve” thus created in
the DSI second quartile was further refined in 1980 by Congress. See, e.g., H.R. Rep. No. 976, Part
II, 96th Cong., 2d Sess. 48 (1980). Second quartile restriction rights are related to but distinct from
top quartile restriction rights, and are not discussed here.
measured in kilowatts of load size, was the "amount" of power sold under the IF contract.76

(2) The IF contracts divided the DSI load into quartiles for the purpose of defining specific BPA rights to restrict deliveries of Industrial Firm Power. For example, BPA had a contract right to restrict twenty-five percent, the top quartile, of each DSI's demand "at any time."77

(3) In place of Provisional Energy provided outside the MF contracts, the IF contracts incorporated the borrowing of DSI firm energy directly into the contract. Nonfirm and "Advance Energy" for the new "top quartile" became part of the Industrial Firm Power under the contracts; Advance Energy replaced Provisional Energy as the borrowed firm energy component of combination service. The Provisional Energy Agreement was permitted to expire.78

(4) The IF contracts provided a single rate (the "IF-1" rate) for all DSI power, including top quartile deliveries whether supported by nonfirm or borrowed firm energy.79

(5) The IF-1 rate schedule provided that if BPA failed to deliver power for any part of a DSI's demand, including the top quartile, BPA would

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76. The IF contracts and the phrase "amount of power" have continuing legal significance for DSI power sales because Congress has required BPA to offer the DSIs contracts for an "amount of power" equivalent to that to which they were entitled under the IF contracts. 16 U.S.C. § 839c(d)(1)(B) (Supp. V 1981). The "amount of power" sold by federal power marketing agencies to industrial customers is a term of art referring to the customer's load size measured in kilowatts of contract demand, rather than a quantity of energy measured in units of consumption (kilowatt-hours). This is true of BPA's DSI contracts as well as industrial contracts of the Tennessee Valley Authority. See TVA 1979 Annual Report vol. II, app. 245–46 (contract with Air Products and Chemicals, Inc., for an "amount of power" of 21,200 kilowatts) (copy on file with the Washington Law Review). See also Niagara Redevelopment Act of 1957, 16 U.S.C. § 836(b)(3) (1976), allocating for service to electro-process industries "445,000 kilowatts" (445 megawatts) of power. In Central Lincoln Peoples' Utility Dist. v. Johnson, 686 F.2d 708 (9th Cir. 1982) (discussed infra at part IV), both sides argued that the meaning of "amount of power" had decisional significance, but the court did not use or explain the phrase in its opinion.

77. IF contract, Exhibit C (General Contract Provisions) § 8(b), 23 CONTRACT OFFICIAL RECORDS, supra note 7, at 6274, 6305. See infra parts IIC & IID. Note that BPA's rights to restrict DSI power deliveries are contained in sections of the contract distinct from the sections that determine the "amount of power" sold (the latter is section 4 of the IF contract).

78. "Advance energy retains most of the characteristics of provisional energy except that BPA expects to supply advance energy by proportionally drafting Hungry Horse and the five new cyclic reservoirs [Duncan, Arrow, and Mica in Canada, Libby and Dworshak in the U.S.] below the normal operating levels required for firm power, rather than only Hungry Horse..." DEIS, supra note 11, Appendix A, at II-46. The expectation proved partially wrong. See infra text accompanying note 88.

79. The IF-1 rate took effect on December 20, 1974. The IF-2 rate, effective December 20, 1979, retained the IF-1 rate's feature of a single rate for all DSI quartiles and the "availability credit" for any failure by BPA to deliver Industrial Firm Power to any portion of the DSI load. See infra note 80.
Nonfirm Energy

compensate that DSI by paying it an "availability credit," or retroactive rate adjustment.80 These features of the IF contracts are discussed below in connection with the 1980 statutory allocation of power to the DSIs.

D. History of Operations Under the IF Contract

1. Interruptions

The experience under the IF contracts helps explain (a) the changes in DSI service made by the Northwest Power Act, and (b) the DSI service contemplated in the current 1981 DSI contracts designed to effectuate the Act. In the ten years of 1968–1977, BPA restricted more than twenty billion kwh of deliveries to the top twenty-five percent of the DSI load.81 This represented roughly ten percent of total DSI demand for this period.82 In other words, the DSIs in effect lost one full year of service during that decade, enough power to produce 2.5 billion pounds of aluminum at 8 kwh per pound.

Under the IF contracts, the DSIs paid a single rate for all power. From 1974 through 1979, this was the IF-1 rate. When any portion of DSI demand, including the top quartile, was interrupted for any reason, the DSIs received an availability credit or retroactive rate adjustment, but only if BPA could not continue top quartile service with Advance Energy, that is, with firm energy borrowed from the DSIs themselves through provisional drafts. The credit was originally set to return the DSIs enough money to buy replacement energy from nonfederal sources during the periods of interruption, if such energy was available.83

In effect, BPA’s other customers paid to use the power denied the DSIs by BPA restrictions, but the DSIs’ use of such power at all other times produced revenue for BPA at a firm power rate (the IF-1 rate), made possible the benefits of provisional drafts, and avoided the cost of additional generation that would otherwise have been necessary to carry the DSI load on the same firm power basis as all other BPA loads.

82. Id.
83. See generally Correspondence of BPA and DSIs with Federal Energy Regulatory Comisión (FERC), Docket No. EF80-2011, BPA letter of Nov. 12, 1982, at 4–5 (proceedings to review BPA’s 1979 power rates) (copy on file with the Washington Law Review) [hereinafter cited as BPA/DSI correspondence].
Many factors militated against any simple continuation of the top quartile service provided by the IF contracts, however. Three were paramount:

(1) Northwest utilities were building power plants whose output might be displaced with BPA nonfirm energy. Regardless of the highest and best use of nonfirm energy from a regional standpoint, some utilities enjoyed statutory “preference” rights to federal power and might ultimately absorb so much nonfirm energy for displacement purposes that the top quartile would be interrupted more frequently than served. Among other results, this would mean Advance Energy—the DSI firm energy borrowed through provisional drafts to provide the second component of combination service—would become less useful and provide fewer benefits to all BPA customers.

(2) Advance Energy became less available than originally contemplated, as explained below, and its repayment through DSI second quartile curtailments became more likely. Thus, both parts of the combination service were jeopardized.

(3) The cost of nonfederal replacement energy increased sharply after 1974. By 1979, BPA abandoned any pretense of paying a credit sufficient to permit the DSIs to purchase such energy when interrupted. This made interruptions far more costly for the DSIs. It also destroyed any objective basis for setting the amount of the credits, as well as the justification for charging the DSIs a firm power rate for nonfirm service.

The bad water years of 1973, 1977 and 1979—in which each DSI lost all or most of its top quartile for twelve months—emphasized how problematic combination service had already become. Given the interruptions already experienced and those already foreseen, the DSIs became unwilling to accept continuation of the particular combination service provided by the IF contract and began seeking a substitute.

2. Advance Energy

In the IF contracts, Advance Energy was a form of provisional draft intended to have relatively little risk to the DSIs. Service with Advance typically began in the fall, when nonfirm service to the top quartile was normally cut off. The Advance was expected to carry the top quartile until the January snowpack survey, at which time, with luck, nonfirm service

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84. For example, 88 publicly-owned utilities and electric cooperatives, each a “preference” customer of BPA, executed in 1976 Participants Agreements to finance and construct two large nuclear power plants, Washington Public Power Supply System Projects Nos. 4 & 5. Washington Public Power Supply System Nuclear Projects Nos. 4 and 5, Participants’ Agreement, Apr. 15, 1976.

85. See generally BPA/DSI correspondence, supra note 83.
could be restored. Under the IF contracts, a DSI’s potential obligation to repay Advance could be deferred for more than three years, ample time for nature to refill reservoirs and discharge the obligation under most recorded natural runoffs. This meant the risk of having to curtail the second quartile to repay Advance was relatively remote.

Three things went wrong:

(1) The full quantity of Advance Energy expected from provisional drafts under the U.S.-Canadian treaty has never materialized. Canadian authorities have not yet permitted reservoirs to be drafted for this purpose. Advance was limited to the energy produced from the equivalent feet of draft at the three U.S. reservoirs—about forty percent of the expected amount. This increased the risk for BPA and the DSIs that even in good water years DSI loads might already be shut down for lack of energy before service with nonfirm energy could resume.

(2) The Corps of Engineers intervened. Instead of letting the potential DSI repayment obligation be carried as long as power operations would permit, so that above-critical streamflows might discharge it, the Corps in the late 1970’s insisted that under certain circumstances the draft be repaid in the same year it was made. These circumstances were not related to power, but to recreation. If repayment could assure optimum reservoir levels for recreation during the recreation season, the Corps or the Bureau of Reclamation might insist on repayment. This dramatically increased DSI exposure to massive fifty percent curtailment. Yet under the IF contracts, the DSIs could not decline this risk by refusing Advance except at the cost of losing the availability credit.

(3) The potential interruption of top quartile deliveries to divert nonfirm energy to future displacement uses by preference utilities made it less likely, on average, that the nonfirm energy component of combination service would follow the borrowed energy component soon enough to prevent the DSI load from being frequently shut down first.

86. See DEIS, supra note 11, Appendix A, at II-44.
88. DEIS, supra note 11, Appendix A, at II-45, II-46. As noted in note 78, supra, the three U.S. reservoirs are Hungry Horse, Libby and Dworshak.
89. DEIS, supra note 11, Appendix A, at II-48. The conditions ultimately insisted upon by the Corps are contained in BPA Contract No. DE-MS79-80BP90114 (1979) (agreement between BPA, Corps, and Bureau of Reclamation “Operating Arrangements and Procedures Relating to the Provisional Operation of Reservoirs for the Delivery of Advance Energy and Return of Provisional Storage Drafts”) (copy on file with the Washington Law Review).
3. **The Lesson Learned: Firm for Operations, Not Planning**

The DSI reaction to these developments was to lose faith in combination service. Thus, the DSIs sought through legislation to have the top quartile provided the same firm power service as all other BPA loads. But another reaction was possible, looking at each component of combination service separately:

### a. The Provisional Draft Component

(i) The Advance Energy impediments posed by Corps' policy appeared to exist because the Corps did not consider twenty-five percent of the DSI load to be "firm." Firm loads are not curtailed to meet recreation goals. If the Corps were to treat the entire DSI load as firm for purposes of operating the hydroelectric system, repayment of Advance on a power timetable, rather than a recreation timetable, might be expected.

(ii) In addition, if the entire DSI load was treated as firm for purposes of resource operation, a variant of provisional drafts to supplement or replace Advance Energy could be found in "shifts" of BPA's "Firm Energy Load Carrying Capability" (FELCC) under the Pacific Northwest Coordination Agreement. By shifting its FELCC—using its firm energy earlier rather than later—BPA could make the DSI top quartile borrow firm energy otherwise reserved for service to the DSI second or third quartiles in later years. But BPA could exercise this Coordination Agreement right only if the top quartile were treated as a firm load for purposes of resource operation, since the Coordination Agreement permits FELCC to be shifted for firm loads only.

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90. See infra part III.
91. The "firm energy load carrying capability" of a power plant or the power system is basically the firm load whose service the plant or system can assure during the 42-1/2 month Critical Period. See supra note 83. As a signatory to the Coordination Agreement, supra note 11, BPA is entitled to receive a share of the coordinated system's energy capability. This share, BPA's FELCC, is the maximum firm energy which BPA is entitled to demand from the coordinated system during the Critical Period. DEIS, supra note 11, Appendix A, at II-34. The Agreement permits BPA and other parties to "shift" FELCC by declaring a larger firm load during the early months of the Critical Period and a correspondingly smaller firm load during later months. This borrowing of future firm energy is akin to a provisional reservoir draft. One principal difference is that a "shift" of FELCC in effect changes the timing of firm energy use from one operating year to another, rather than from one season to another within a single year. The Agreement also permits movement of FELCC within any given year, however ("flexibility" FELCC). See S. REP. No. 272, 96th Cong., 1st Sess. 59 (1979).
92. Coordination Agreement, supra note 11. The Coordination Agreement is a long term contract among many (not all) federal and nonfederal reservoir operators in the Northwest. Its purpose in part is to coordinate operation of the region's hydro system and to define the rights of different operators and their obligations to one another. For a brief summary of the history and operation of the Agreement, see DEIS, supra note 11, Appendix A, at II-29 to -42.
93. See supra note 91.
(iii) Treatment of the top quartile as a firm load had to be limited to the context of operations and not extended to planning, or combination service would be impossible. If the top quartile were firm for all purposes, BPA would be obligated to plan for and acquire additional firm power resources to serve it, just as it would for any other firm load. This would force BPA and the region to incur the very costs that combination service was intended to avoid.

BPA therefore developed the concept of treating the top quartile as firm for purposes of resource operation, but not for purposes of resource planning. As noted above, for BPA to avoid the cost of new power plants and continue to produce the benefits of combination service, it was necessary that the top quartile be treated as firm for purposes of resource operation only.

b. The Nonfirm Energy Component

If the top quartile were treated as a BPA firm load for purposes of resource operation, the availability of the nonfirm energy component of combination service would also be enhanced—automatically. This would occur because BPA’s resources, including dams and water available for production of nonfirm energy, would be operated to serve all BPA loads, including the top quartile. Only after all BPA loads were met could those resources be operated for other purposes, including the purpose of selling BPA nonfirm energy to utilities that use such energy to displace the operation of their own power plants. The use of nonfirm energy directly in load would thus take priority over sales of nonfirm energy to utilities whose full loads were already being met.

To secure the nonfirm portion of combination service, it would thus be sufficient to treat the top quartile as firm for purposes of resource operation—the same treatment that would ensure that enough DSI firm energy could be borrowed from the future to make combination service continuous under average, but not critical, water conditions.

94. Thus, when planning the construction and acquisition of additional power plants, the top quartile would not be counted as a load for which such plants would be required.

95. See supra part I.

96. See, e.g., S. Rep. No. 272, 96th Cong., 1st Sess. 59 (1979) (top quartile will be “served with resources which are in excess of critical planning amounts but operated to meet the entire DSI load as if it were firm”). For more detailed discussion by the BPA Power Manager, see 1 CONTRACT OFFICIAL RECORDS, supra note 7, at 254–91.

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III. TOP QUARTILE SERVICE UNDER THE NORTHWEST POWER ACT

A. The PNUCC Bill

The PNUCC bill (for “Pacific Northwest Utilities Conference Committee,” the organization under whose auspices it was drafted) reflected DSI disillusionment with combination service, not BPA concepts designed to make combination service viable throughout the future. Introduced by request in 1977, the PNUCC bill was drafted primarily by Northwest utilities and DSIs.

The PNUCC bill provided each DSI three quartiles of firm power at one rate, and, initially, one quartile of nonfirm energy at a lower rate. BPA could thus have continued combination service to the top quartile for any DSI that elected it. But the bill also provided each DSI the option of receiving firm power for its top quartile at a higher rate. The DSI need only give notice to BPA, and BPA would be obligated to plan for and acquire the additional firm power resources needed for this purpose.

The reasons the DSIs sought firm power service are discussed above: combination service had been breaking down, and further erosion seemed likely. The DSI and utility drafters of the PNUCC bill believed the time had come to plan firm resources to support top quartile service. As shown below, BPA was not convinced. It sought instead to perfect combination service.

B. The Regional Bill

1. Preparing the Bill

When the PNUCC bill died, Northwest members of Congress, PNUCC, BPA and others set out to find a substitute. On top quartile issues, BPA took the position that (1) building a firm resource to serve a

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97. PNUCC is essentially an umbrella group for all BPA customers in the Northwest. For a brief description of PNUCC, see DEIS, supra note 11, Appendix A, at II-2 to -3.


99. S. 2080, 95th Cong., 1st Sess. § 7(f), 123 CONG REC 28554 (1977). Although the PNUCC bill would have obligated BPA to plan firm rather than nonfirm energy sources for top quartile service, BPA would have retained contract rights to restrict delivery of DSI top quartile power, since the top quartile remains a reserve to protect other BPA loads regardless of whether BPA plans to serve it with firm or nonfirm energy. For discussion of DSI rate, resource, and reserve provisions of PNUCC bill, see Hearings, supra note 81, Part I, at 276-83 (testimony of Gordon C. Culp, PNUCC counsel).

100. Hearings, supra note 81, Part I, at 276-83.

101. Id.
load that combination techniques could serve was not acceptable, and (2) it wished to retain for its other customers the benefits of combination service. BPA therefore devised the combination service that, with a few significant changes, the DSIs now receive.

BPA’s proposed form of combination service required legislative assistance. To maintain the availability of nonfirm in the combination, for example, the use of nonfirm energy directly in load had to be given priority over “surplus” sales of such energy to utilities for displacement purposes. Thus:

(1) BPA’s contract obligation to the DSIs had to include 100% of the DSI load, not seventy-five percent. This would require BPA to use all available energy, including nonfirm, to meet all BPA loads, including the DSI top quartile, before selling any energy to utilities as “surplus” energy to be used for displacement purposes. To make top quartile service a BPA contract obligation, the DSI contracts therefore had to cover either the “load requirements” of each DSI\(^{102}\) or the “amount of power” to which each DSI was entitled under its IF contract of 1975.\(^{103}\)

(2) No power, firm or nonfirm, could be considered surplus until all BPA contract obligations, including to the DSIs, were met.\(^{104}\)

(3) BPA’s rights to interrupt, curtail or otherwise withdraw DSI power must be limited to interruptions needed to protect BPA’s firm loads from shortages,\(^{105}\) thus precluding interruptions of DSI top quartile service “at any time” for the purpose of supplying preference utilities with excess power used only for displacement of utility power plants.

To improve the borrowed energy component of combination service, it was necessary only that the legislation not limit the resources BPA relied on to meet its contractual obligation to the full DSI load. This would permit BPA to treat the full DSI load as firm for purposes of resource operation.\(^{106}\) It would also give BPA the ability to treat the entire DSI load as firm for all purposes if, at some future time, combination service deteriorated.\(^{107}\)

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102. This was the approach in the 1978 version of the BPA bill. 124 Cong. Rec. 26396 (1978) (section 5(c) of S. 3418, providing BPA power for each DSI’s “load requirements”).


106. See supra text accompanying notes 78–82.

107. The Act does not limit the resources BPA may use to meet the contracted load requirements of its customers; it entitles BPA customers to “power” for certain statutorily defined loads, and BPA must provide such power, but the source of the power is unrestricted. The Act itself also contains no mention of DSI quartiles. See, e.g., Northwest Power Act, supra note 68, § 5(b)(1), 16 U.S.C. § 839c(b)(1) (Supp. V 1981) (sales to utilities); id. § 5(d)(1)(B), 16 U.S.C. § 839c(d)(1)(B) (sales to DSIs).
2. The Bill in the Ninety-fifth Congress

In August, 1978, after the new bill was unveiled, BPA prepared and distributed to its customers and the bill’s congressional sponsors a detailed analysis of the bill’s power allocation provisions. The analysis described at some length the proposed DSI service. The following excerpt is particularly important:

The greatest opportunity for a change in the prospective industrial firm sales is in operations affecting the predictable supply to the DSI load and in a corresponding increase in the reserves they provide. By treating the entire DSI load as a firm load, subject to interruption in favor of other loads in the region, the DSIs will receive service which is closer to full service under many more operating conditions than they do at present. The DSI load is uniquely able to be considered in this fashion because they can borrow on the expectation of better than critical streamflows or resource production, yet stand ready to curtail their loads beyond the normal reserve requirement in order to protect continued service to regional firm loads. The expected increase in industrial firm supply on a long-term average is from a present 75% industrial firm with 14% additional nonfirm sales to nearly 96% industrial firm service.108

This statement grew and changed until, a year later, it became the more detailed statement in Appendix B of the Senate committee report.109

Hearings were held on the new bill. On September 5 and 8, 1978, for example, Mr. Jack Speer of Anaconda Aluminum testified before the Senate and House. While unhappy about the DSI rates (higher than under the PNUCC bill), Mr. Speer did applaud the treatment of the top quartile: “BPA’s treatment of all our loads as firm except when interruptions are necessary to protect other firm loads will provide us with more usable energy, still protect firm loads and at the same time reduce spillage of valuable water.”110

The bill had one markup in the Ninety-fifth Congress, conducted by Representative Lloyd Meeds (D-Washington), a sponsor and chairman of the House Water and Power Resources Subcommittee. That markup resulted in two additions to the bill that affected combination service for the DSI top quartile; each of these additions was retained when the bill became law more than two years later. Before markup, the subcommittee counsel proposed certain amendments, among them one making “reserves” a defined term. In a memorandum to Meeds, the counsel said of this definition:

108. 25 CONTRACT OFFICIAL RECORDS, supra note 7, at 6748–50 (excerpt); 16 RATES RECORD, supra note 7, at 8834–74 (complete document).
110. 20 RATES RECORD, supra note 7, at 11174, 11184–85.
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"Reserves" as used in reference to the DSI contracts becomes a defined term in order to satisfy the preference customers as well as the DSIs, and the definition makes clear that the reserves are for the benefit of firm loads within the region. The latter aids BPA in operating the river, and makes good on one element of the program needed to produce the rates BPA has estimated.111

The subcommittee adopted the counsel’s proposed amendment:

"Reserves" as used in connection with power sold to the direct-service industrial customers means the energy and/or capacity available to the Administrator through contract rights to interrupt, curtail, or otherwise withdraw, for the benefit of firm loads within the Pacific Northwest, portions of the energy and/or capacity supplied such customers when needed to avert particular planning and/or operating contingencies specified in his contracts with such customers.112

With several changes, this definition became that now found in section 3(17) of the Act.113 It aids BPA in operating the river, as the counsel’s memo said, by making clear that BPA’s rights to “interrupt, curtail, or otherwise withdraw” power from the DSIs are for the benefit of firm loads. Thus, BPA cannot interrupt DSI power in order to make nonfirm energy available to utilities for displacement purposes, or to raise reservoir levels for recreational purposes. The subcommittee further emphasized this purpose of BPA’s DSI restriction rights by amending the section of the legislation that required DSI sales to provide reserves; after the word “reserves” the subcommittee added the phrase “for the firm power loads served by the Administrator within the Pacific Northwest.”114 This limitation is now found in section 5(d)(1)(A) of the Act.115

At the request of the Northwest delegation and BPA customers, BPA prepared an annotated section-by-section analysis of the subcommittee amendments, which states in pertinent part:

114. Meeds’ Markup, supra note 112, at 11 (underscoring, indicating subcommittee’s amendments, omitted).
115. 16 U.S.C. § 839c(d)(1)(A) (Supp. V 1981) (“Such sales shall provide a portion of the Administrator’s reserves for firm power loads within the region.”). See also S. Rep. No. 272, 96th Cong., 1st Sess. 23 (1979) (“It is not intended that the Administrator’s reserves will be used to protect other than firm loads.”).
This amendment would define the word "reserves" as used throughout the bill. It makes clear that the reserves are for the benefit of firm loads within the region.

This amendment allows the Administrator to sell power to direct-service industrial customers so long as such sales provide reserves for the firm power loads served by the Administrator within the region. Such sales do not have to provide reserves for non-firm power loads within the region.\(^{116}\)

By making clear that BPA's rights to "interrupt, curtail, or otherwise withdraw" DSI power—an inclusive phrase—would be used to protect firm loads only, not to make nonfirm sales, these proposed statutory provisions would secure the nonfirm energy portion of the contemplated combination service.

3. *The Bill in the Ninety-sixth Congress*

After the bill was reintroduced in the Ninety-sixth Congress, the provisions relevant to combination service were further clarified:

(1) BPA's contract obligation to the DSIs (the initial allocation, subject to restriction) was for 100% of the DSI load as it had been under the IF contracts of 1975.\(^{117}\)

(2) BPA could not sell surplus firm or nonfirm energy until its contract obligations, including to the DSIs, were met.\(^{118}\)

(3) BPA's rights to "interrupt, curtail, or otherwise withdraw" power from the DSIs were to protect firm power customers from shortages, not "contingencies."\(^{119}\) In response to written questions from the House Energy and Power Subcommittee, BPA formally confirmed that the phrase "interrupt, curtail, or otherwise withdraw" was inclusive, "in order to embrace all forms of power delivery restriction to the DSIs."\(^{120}\)

(4) BPA was expressly deemed to have sufficient power to execute all contracts mandated by the Act, thus freeing the DSI and private utility contracts from challenge on "preference clause" grounds.\(^{121}\)


\(^{121}\) Northwest Power Act, *supra* note 68, § 5(g)(7), 16 U.S.C. § 839c(g)(7) (Supp. V 1981). See H.R. REP. No. 96-976 (Part I), 96th Cong., 2d Sess. 36–37, 64 (1980). This provision of the Act was added by amendment in the Senate Committee on Energy and Natural Resources simultaneously with sections 5(a) and 10(c) of the Act, which preserve the preference provisions of prior laws. 16
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The legislative history was also made more clear. In February and July 1979, BPA revised for customers and Congress its analysis of allocation under the bill.122 These analyses described top quartile service as BPA had in its August 1978 analysis; the July 1979 analysis became Appendix B of the Senate report:

The quantity of [DSI] power for rate purposes is based on the proportion of the total industrial requirement, on a long-term average (currently estimated to be between 85 percent and 96 percent of the total DSI load), that BPA projects it will be able to serve directly. This projected availability is predicated on the continued planning and development of "firm" resources under critical streamflow conditions to carry 75 percent of the total DSI requirements. The balance [i.e., top quartile] would be served with resources which are in excess of critical planning amounts but operated to meet the entire DSI load as if it were firm. The operation of the System to carry out this purpose results from treating as a firm load the maximum amount of the DSI load (not all of which can be covered under critical streamflow planning), to the extent that [(1)] this maximum load can be met in the initial period of the PNW Coordination Agreement Critical Period while [(2)] protecting firm loads against the worst historical streamflow and [(3)] maintaining an ability to restrict an equivalent amount of the DSI loads in the later periods (without provisional or advance energy being made available for this amount of the DIS [sic] load). Further, in actual operation DSI power withdrawn or curtailed in excess of interruptions for critical streamflows would be replaced by power purchased by BPA on a short-term basis, if available. The projected amounts estimated for the purposes of this analysis [i.e., the eighty-five to ninety-six percent estimates] recognize the currently projected resource deficits. However, it assumes that by 1985 under the proposed legislation the System would be in load/resource balance.123

This explanation covers several points. It describes combination service with nonfirm energy124 ("resources which are in excess of critical planning amounts") and shifted FELCC; the amount of and security for the shift are described in the clauses with the bracketed numbers added. It also describes BPA's obligation to replace through short term purchases DSI power "withdrawn or curtailed in excess of interruptions for critical streamflows";125 this obligation demonstrates, including to the Corps, U.S.C. §§ 839c(a), 839g(c) (Supp. V 1981). In the Senate Committee bill, the provision that is now section 5(g)(7) of the Act, 16 U.S.C. § 839c(g)(7), was actually included twice, once with reference to the required DSI contracts only. S. REP. No. 272, 96th Cong., 1st Sess. 5 (1979) (section 5(c)(1)); id. at 12 (section 9(c)(2)).

122. 20 RATES RECORD, supra note 7, at 11213–34 (Feb. 1979 analysis).
124. Id.
125. Id. To act consistently with this stated obligation, BPA must replace with purchased energy

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that BPA, too, will serve the top quartile as firm except when critical streamflows make this impossible. And it projects the expected average availability of power through combination service to be eighty-five to ninety-six percent under conditions of regional load/resource balance—conditions assumed from 1985 onward.

The Senate report and two House reports each described the intended service for the full DSI load, the intended restriction rights for each quartile, and the intended use of such restrictions to protect firm loads, not utility nonfirm purchases. That BPA would obtain, through combination service, four quartiles of DSI power sales revenues while incurring only three quartiles of firm power resource costs in serving the DSIs was also recognized as an economy that would help make possible the rate benefits the legislation contemplated for BPA's other customers.

In mid-1980, the Water and Power Subcommittee asked BPA to analyze DSI service under the bill; BPA replied in August 1980. When the full Interior Committee acted, its report incorporated verbatim BPA's description of DSI service, adding only the introductory clause:

The Committee understands and intends that the new DSI contracts under the legislation will provide capacity reserves. . . . The DSIs will also provide two types of energy reserves. Approximately 25 percent of the DSI load is to be treated as a firm load for purposes of resource operation and will provide an operating reserve that may be restricted by BPA at any time in order to protect the Administrator's firm loads within the region and for any reason, including low or critical streamflow conditions and unanticipated growth of regional firm loads. An additional 25 percent (the second quartile) of the DSI load will be treated as a firm load for both planning and operating purposes and will provide a planning reserve to protect the Administrator's firm loads against the delayed completion or unexpectedly poor performance of regional generating resources or conservation measures implemented or acquired by BPA.

Senators Jackson and McClure, then chairman and ranking minority member of the Senate Energy Committee, each affirmed at final Senate passage that the cited language from the House Interior Committee report any energy not delivered to the DSIs because of the Ninth Circuit's ruling in Central Lincoln Peoples' Util. Dist. v. Johnson, 686 F.2d 708 (9th Cir. 1982) (discussed in part IV infra).


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represented the understanding and intent of the Senate committee as well.\footnote{130}

IV. CENTRAL LINCOLN I AND THE FUTURE OF COMBINATION SERVICE

The Act became law on December 5, 1980. On August 28, 1981, within the nine-month deadline established in the Act,\footnote{131} BPA offered all customers new power sales contracts. The language from the House Interior Committee report set forth above was incorporated into the new DSI contracts as section 7(c), governing BPA’s top quartile power supply obligations and restriction rights. A few days after the contracts were offered, several publicly owned utilities (BPA preference customers) filed with the U.S. Court of Appeals for the Ninth Circuit a challenge to the lawfulness of section 7(c) and three related provisions of the new DSI contracts.\footnote{132}

The challenged contract provisions each permit BPA to restrict deliveries to the DSI top quartile “at any time for any reason in order to protect Bonneville’s ability to meet” its firm loads, but prohibit such restrictions for the purpose of permitting BPA to sell nonfirm energy to utilities. The utilities alleged, inter alia, that these provisions violated the preference clause by effectively denying public bodies and cooperatives priority in the sale of BPA nonfirm energy.

The Ninth Circuit ultimately held that in the absence of clear direction from Congress the preference clause requires BPA to offer nonfirm energy to preference utilities before supplying it to the DSI top quartile.\footnote{133} The court specifically acknowledged, however, that Congress intended BPA to use shifted FELCC for top quartile service.\footnote{134}

In effect, Central Lincoln I thus diminishes, to an uncertain extent, the availability of the nonfirm energy component of combination service while securing the availability of the borrowed firm component. Because the usefulness of either component depends in part on the availability of the other, however, the impact of Central Lincoln I on combination service certainly exceeds its impact on the availability to the DSIs of the nonfirm energy component alone.

\footnote{130} 126 Cong. Rec. S14691, S14698 (daily ed. Nov. 19, 1980). That this was in fact the case is indicated by the Senate Report, which noted with respect to the definition of “reserves” that “[i]t is not intended that the Administrator’s reserves will be used to protect other than firm loads.” S. Rep. No. 272, 96th Cong., 1st Sess. 23 (1979).
\footnote{133} Id.
\footnote{134} Id. at 713 n.7.
This is not, perhaps, an appropriate time or place to analyze the reasoning in *Central Lincoln I* or to speculate about the ultimate impacts of the decision if it stands. Nor is *Central Lincoln I* the only threat to combination service. One irony of the Act is that by diversifying regional power planning and opening the planning process to expanded public participation and debate, the Act has itself encouraged renewed argument on specific power policy questions it was designed in part to answer. In the broadest sense, combination service presents just such a continuing policy question, even if the Act is seen as answering that question for the immediate future.

No law, no contract, and no judicial decision can secure such a complex concept completely; it will always be subject to erosion through dozens of small and seemingly unrelated policy decisions. This article reflects a belief that if combination service were more widely understood and its benefits more widely recognized, its future would be more secure. The belief may be wrong; it may be biased; it is unlikely to be tested. If combination service dies, it is likely to die in the dark. The region will no longer minimize the resources it needs to carry its loads, but not because it chose not to: because it never knew it could.

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135. The author argued the case for the DSIs before the Ninth Circuit. On December 23, 1982, the DSIs petitioned the Supreme Court for a writ of certiorari in the case, with the author as one of the lawyers on the petition. Certiorari was granted on March 25, 1983. 51 U.S.L.W. 3699 (U.S. Mar. 25, 1983) (No. 82–1071).