

PO 2-2-13 OPERATING SUMMARY 1976-1977  
(BPA POWER SITUATION STATEMENT)

BONNEVILLE POWER ADMINISTRATION  
Power Situation Statement  
Monthly Summary  
March 1982

*ELB* APR 20 1982  
*Staff*  
*EGD*

Power Supply

The March 1 probable January-July volume runoff forecast for the Columbia River at The Dalles was 126.0 million acre-feet, the third highest March 1 forecast in the last 12 years. This forecast was 115 percent of the 15-year average runoff (1963-77). Coordinated System storage energy was 9.7 billion kilowatthours above the amounts indicated by rule curves on March 31, 1982.

BPA continued to make direct service available to its industrial customer total loads and to market nonfirm energy to Northwest and Southwest utility customers. Nonfirm energy sales are expected to continue through July.

Generation and Load

BPA established a new one-hour Federal hydro generation record on March 16, and again on March 17 of 16,334 megawatts. A 24-hour total system generation record of 341,044 megawatthours was established on March 31.

Pacific Northwest Coordinated System total loads, unadjusted for temperatures, were 11.0 percent below the peak and 13.1 percent below the energy estimates for the month. Federal Columbia River Power System total loads, which include contractual deliveries to generating utilities and the total BPA industrial load, were 13.5 and 17.1 percent below the peak and energy estimates, respectively, this month.

Unit No. 15 at Bonneville Dam was synchronized on the system on March 31.

Net scheduled energy transactions on the Pacific Northwest-Pacific Southwest Intertie during March totaled about 2,700,000 megawatthours to Pacific Southwest utilities.

Loads and resources for BPA and the Coordinated System are shown on the attached charts. Load data and comparisons are shown below:

	March 1982*		July 1981-March 1982	
	Megawatts	As Percent of Last Month	Megawatts	As Percent Same Period Last Year
<u>Federal Load</u>				
Peak	14,088	88.8	16,143	110.9
Energy	8,259	94.9	8,927	98.1
<u>Industry First Quartile Ld.</u>				
Energy	331	98.5	513	77.4
<u>Coord. System Load</u>				
Peak	21,745	85.3	26,970	106.2
Energy	16,035	92.2	16,128	99.1

\*Data for the four weeks ending Wednesday, March 31, 1982.

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## Reservoir Conditions

Reservoir elevations as of March 31, 1982, compared with rule curves and full elevations are shown on the following table:

	Elevations in Feet Above Mean Sea Level		
	Actual	Rule Curve	Full
Libby	2347.37	2303.20	2459.0
Hungry Horse	3498.40	3473.80	3560.0
Albeni Falls	2055.67	2051.00	2062.5
Grand Coulee	1229.90	1220.30	1290.0
Dworshak	1462.57	1454.90	1600.0
John Day	264.50	263.60	268.0
Hills Creek	1516.60	1506.70	1541.0
Lookout Point	893.72	883.80	926.0
Cougar	1643.59	1628.60	1690.0
Green Peter	984.80	987.30	1010.0
Foster	621.75	627.50	637.0
Detroit	1533.52	1534.10	1563.5
CANADIAN STORAGE RESERVOIRS			
Mica	2422.27	2405.70	2470.4
Arrow	1406.18	1378.50	1444.0
Duncan	1812.09	1794.80	1892.0

## Thermal Generation

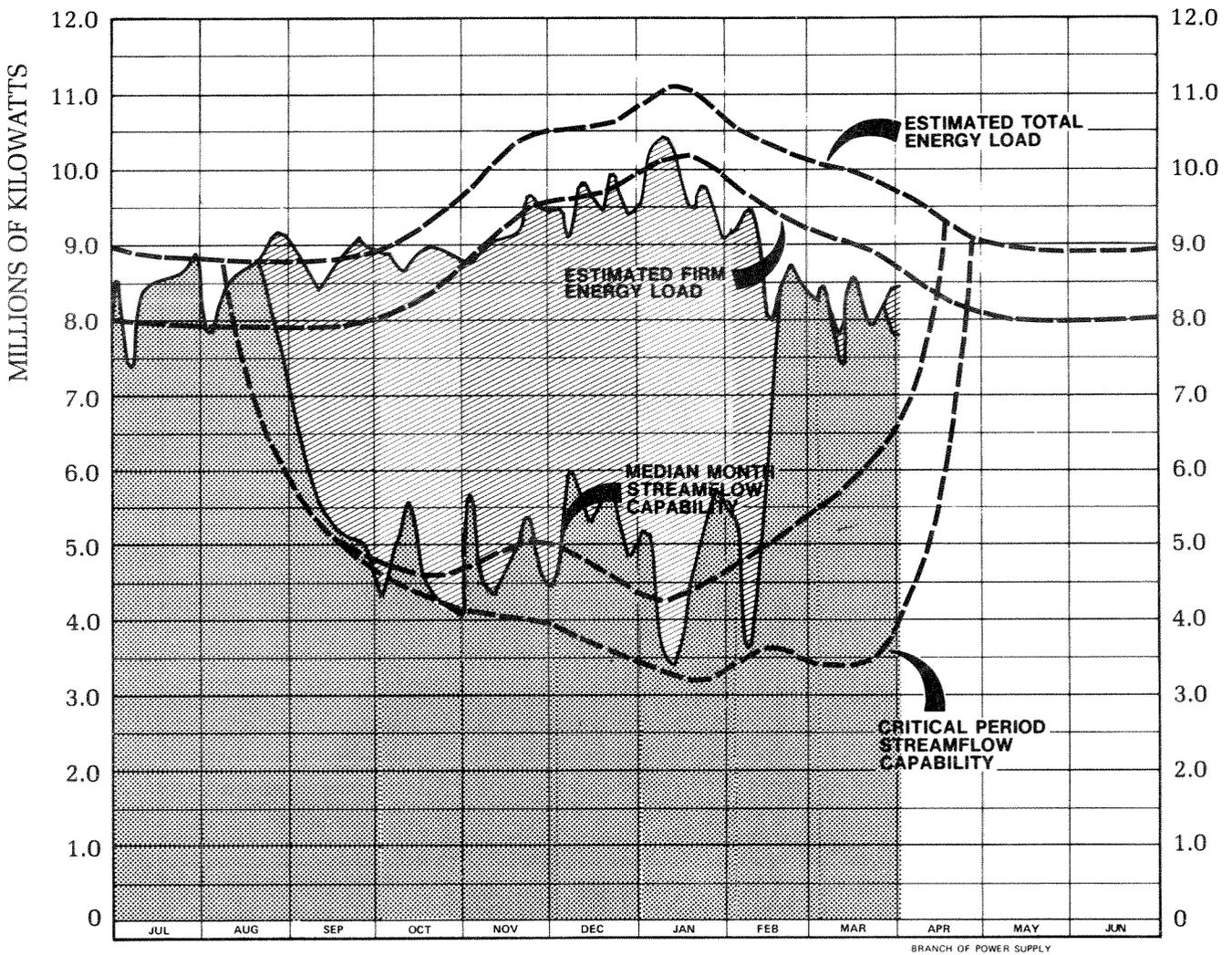
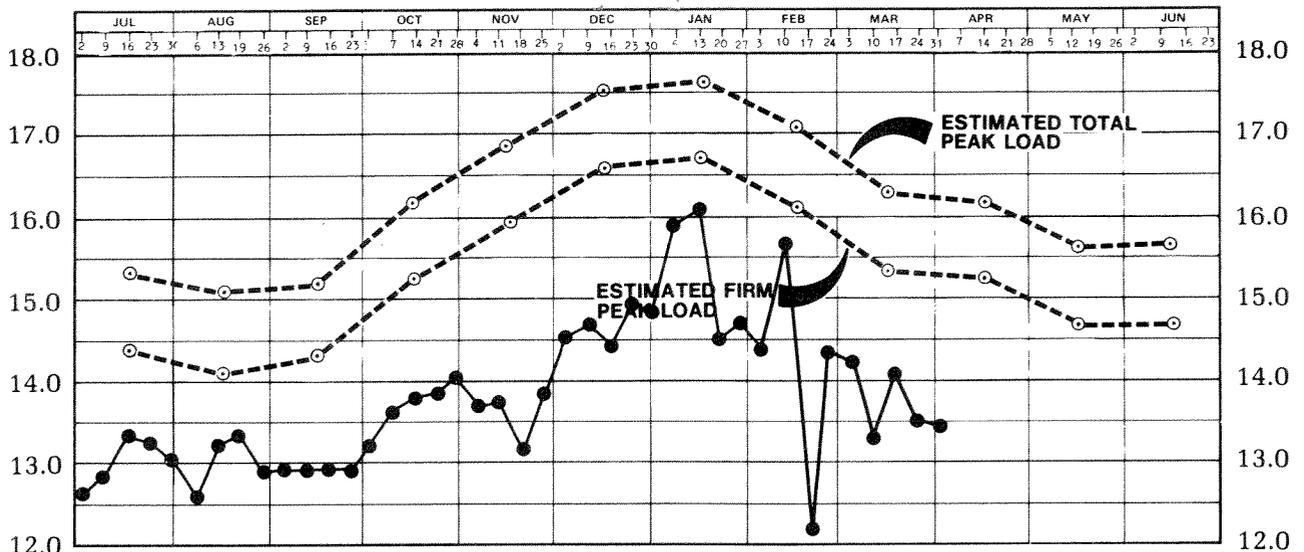
The Hanford nuclear plant was out of service one week at mid-month. Unit No. 1 at the Centralia coal-fired plant, which was already out of service for economy reasons, was declared out of service for maintenance this month. The Trojan nuclear plant was taken out of service at the end of March for economy reasons and refueling. Thermal plant generation for March is shown below:

Project	Energy 1000 kWh	Plant Factor Percent	Capacity 1000 kW
Hanford	436,187	69.8	840
Centralia	248,902	25.5	1,313
Trojan	572,379	71.2	1,080

## Streamflows

Natural streamflows in the Columbia Basin continued to average well above median levels due to mild temperatures and above normal precipitation. Natural streamflows of the Columbia River at Grand Coulee and The Dalles compared with critical and median-month streamflows are shown in the following table:

STREAMFLOWS								
Average Natural Discharge In Cubic Feet Per Second								
		March 1982			July 1981-March 1982			
		Median Month	Actual As % of Critical	Actual As % of Median	Actual	Actual As % of Critical	Actual As % of Median	
Actual	Critical Year	Year						
Grand Coulee	76,100	48,820	240.2	209.1	87,300	135.8	132.1	
The Dalles	187,300	112,200	223.2	166.9	143,200	140.5	125.4	

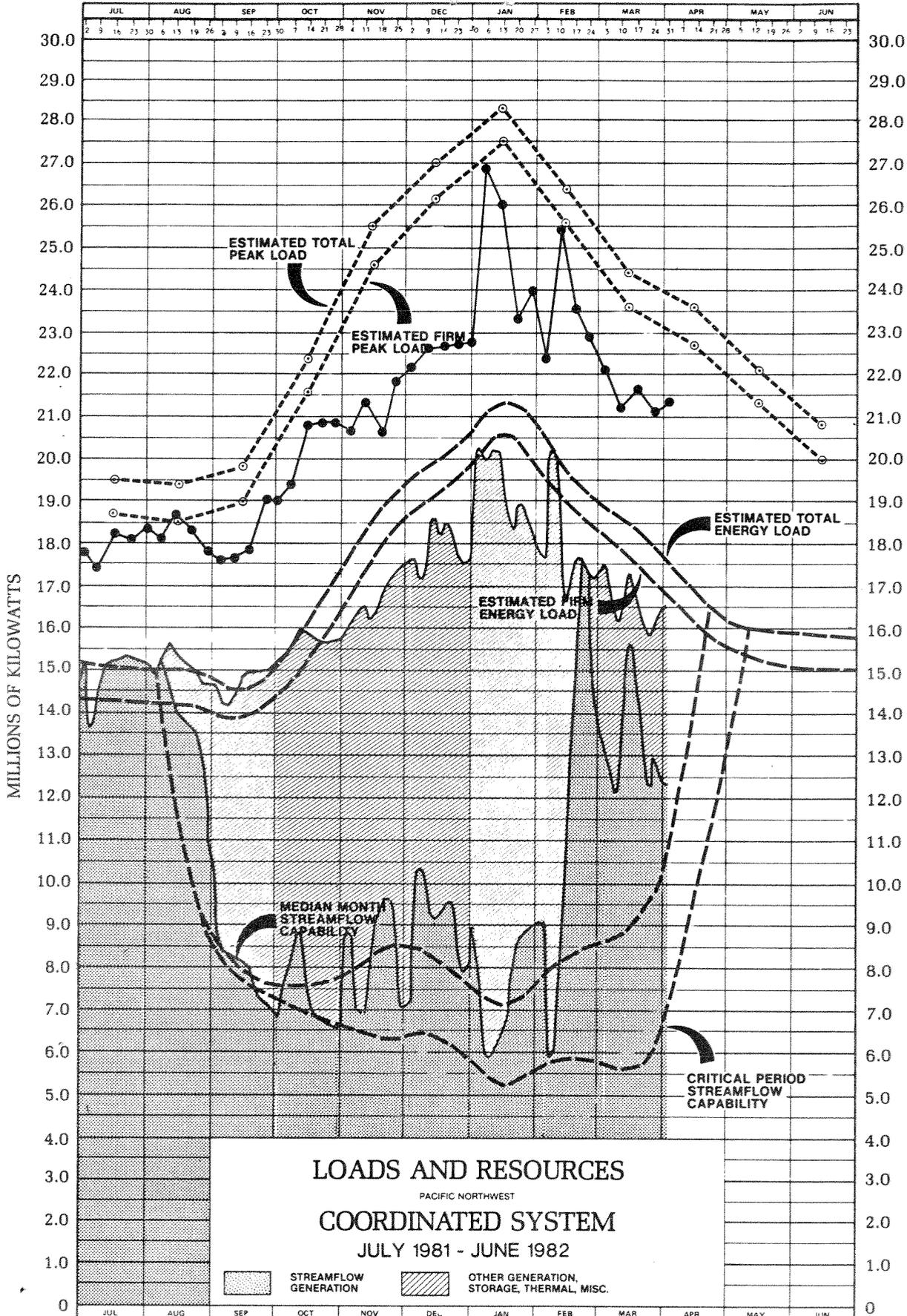


# LOADS AND RESOURCES

## BONNEVILLE POWER ADMINISTRATION

### JULY 1981 - JUNE 1982

STREAMFLOW GENERATION
  OTHER GENERATION, STORAGE, THERMAL, MISC.



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Power Situation Statement  
January 6, 1982

Accumulated precipitation for the month of December was 128 percent of average for the Columbia Basin above The Dalles. The Columbia drainage above Grand Coulee experienced 102 percent of average precipitation for the same period. 109 percent of average precipitation has been recorded for the basin above The Dalles for the period from October 1 through December 31. During the month of December the wettest areas were across Oregon and Snake River Basins with slightly wetter than normal in most other areas. The very heavy precipitation in Oregon has lead to near record early season snowpacks across much of the state. Temperatures at the major load centers have averaged only slightly above normal for the month of December. The BPA weather forecast calls for load center temperatures to be as much as 20 degrees below normal as the result of cold Arctic air which moved into the Pacific Northwest region Tuesday. Wednesday's minimum temperature at Portland of 14 degrees was a record for January 6. Additional snow is forecast for Thursday throughout the basin with warming and rain west of the Cascades by Friday. Temperatures will remain cold east of the Cascades during the balance of this week.

Natural streamflows have averaged 94 percent of median at The Dalles for the 10-day period ending January 4. Flows had receded to a level of 77,500 cfs or 94 percent of median on that date. Natural streamflows are expected to remain low during the remainder of this week with cold temperatures throughout the basin.

As of midnight, January 5 Coordinated System reservoirs were 2.7 billion kilowatthours above energy content curves. Sixty percent of this energy is Federal system energy.

For the week ending December 30 the nontemperature adjusted BPA system firm energy load underran the Operating Program load estimate by 8.4 percent. No BPA system load records have been set during the recent cold weather. The highest hourly BPA system load during this cold weather is about 6 percent below our previous record established in January 1980. Sixty-minute Federal generation and system generation records were set at the 0900 hour on January 6. Substantial quantities of nonfirm energy were included in the generation totals on those hours. No capacity problems are anticipated this month. West Kootenay Power and Light has purchased 65 megawatts of emergency capacity from BPA this week.

BPA continues to sell approximately 1100 average megawatts of nonfirm thermally-generated energy at a cost of about 25 mills per kilowatthour. The majority of this energy is being delivered to California utilities after having first been offered in the Northwest. During the last 2 days Montana Power Company, Seattle City Light, and Portland General Electric have also been buying this nonfirm energy during heavy load hours. For the period from December 8 to January 5 BPA sold about 450,000 megawatthours at an average price of 26.3 mills per kilowatthour for a total revenue of

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about \$12 million. The recent high energy loads assure us of meeting our estimated flood control requirements at the end of January with a continuation of this level of nonfirm marketing.

The Pacific Northwest-Southwest interties continue to be loaded to only about 80 percent of full capacity because of high levels of northern California hydro generation. Northwest utility sales of nonfirm energy range in price from 25 to 29 mills per kilowatthour. B.C. Hydro is expected to raise their price slightly because of the latest inflow forecast for Williston Reservoir indicating less than 90 percent of average January-July runoff. Net deliveries of energy to California from the Pacific Northwest on the intertie established a new record for calendar year 1981. The previous annual record was established in 1976. Total sales also exceeded any previous calendar year by approximately 22 percent.

Four large units are currently available at the third powerhouse at Grand Coulee. The unit breaker for unit G-24 failed on January 5 eliminating the short period of 5-unit availability which began on December 24, 1981. Spare parts are being taken from the breaker on unit G-22, but total repair time is expected to take 6 weeks. A transfer of the overhead transmission circuit to unit G-22 could be accomplished in 2 weeks but would require an additional unit be taken out of service during this time.

For the week ending January 3 Hanford produced an average of 843 megawatts. Average generation for Trojan for the same period was 1,044 megawatts giving 313 megawatts average to the Federal system. At Centralia a 50 percent reduction on unit 1 from 1100 Saturday to 2000 Sunday because of bad gears in the number 11 auxiliary turbine reduced BPA's share to about 115 megawatts. Beginning at 0001 Friday, January 1, 12 percent of Centralia generation began coming to the Federal system under purchase arrangements negotiated with Snohomish and Gray's Harbor PUD's. Our share of the tested capability of the plant will be about 158 megawatts.

R. D. Griffin, Assistant Director  
Division of Power Supply

Distribution:

Via Computer Terminal:  
Area and District Offices  
E. Sienkiewicz - P  
G. Tupper - O  
R Lamb - PR  
R. Eiguren - AI  
B. Merlin - AI

Via Mail:  
U.S. Corps  
of Engineers (4)  
R. Haines - PSK (2)  
R. Hearn - PSH  
R. Maney - PSP  
E. Starr - ECI  
R. Hardy - PE  
R. Schiewe - PSKS

J. Yocum - DRK  
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D. Faulkner - PS  
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BONNEVILLE POWER ADMINISTRATION  
 Power Situation Statement  
 Monthly Summary  
 September 1977



Power Supply

September ended a water year which was the driest on record across the Columbia Basin. The October 1976-September 1977 water year runoff of 78.6 million acre-feet for the Columbia River at The Dalles, Oregon, broke a 52-year old low runoff record, exceeding the previous lowest runoff of 84.9 million acre-feet established October 1925-September 1926.

At the end of September Coordinated System reservoirs were 14.2 million acre-feet or about 16.0 billion kilowatthours short of full. This compares to a deficiency of 14.1 billion kilowatthours on July 31 and 14.4 billion kilowatthours on August 31. The Coordinated System Operating Plan indicates a draft of 2.2 billion kilowatthours by September 30, so that the deficiency from normal reservoir levels amounted to 13.8 billion kilowatt-hours at the end of September.

The BPA nonfirm industrial load is operating at about 23% of capacity with high-cost energy purchases. Some area utilities are purchasing energy from outside the area to avoid operation of their high-cost thermal generation and to conserve reservoir storage.

Generation and Load

Federal Columbia River System total loads for the month of September were 22.3% and 7.7% below the peak and energy estimates. Small amounts of the energy stored in California during the fish flow 1977 were returned during September. By the end of the month about 24 percent of the total amount which had been stored in California had been returned.

Pacific Northwest Coordinated System total loads were 9.7 percent below the peak estimate and 10.3 percent below the energy estimate.

Loads and resources for BPA and the Coordinated System are shown on the attached charts. Load data for September 1977 are shown below:

	September 1977*			Jul 77-Sep 77	
	Megawatts	As Percent of Last Month	As Percent Same Month Last Year	Megawatts	As Percent Same Period Last Year
<u>Federal Load</u>					
Peak	10395	103.3	91.6	10526	92.7
Energy	7551	105.7	93.2	7390	95.2
<u>BPA Nonfirm Indus. Load</u>					
Energy	229	86.1	32.8	252	36.2
<u>Coordinated System Load</u>					
Peak	15764	104.0	101.3	15764	100.9
Energy	12205	98.1	96.0	12248	96.3

\*Coordinated System energy data are for the four weeks ending September 29, 1977.

### System Operations

Reservoir elevations as of September 30, 1977, compared with rule curves and full elevations are shown on the following table:

	<u>Elevations in Feet Above Mean Sea Level</u>		
	<u>Actual</u>	<u>Rule Curve</u>	<u>Full</u>
Libby	2411.06	2455.7	2459.0
Hungry Horse	3509.91	3558.0	3560.0
Albeni Falls	2060.16	2060.0	2062.5
Grand Coulee	1286.60	1289.0	1290.0
Dworshak	1545.05	1585.9	1600.0
John Day	266.60	267.1	268.0
Hills Creek	1467.72	1481.1	1541.0
Lookout Point	895.09	878.1	926.0
Cougar	1620.96	1603.0	1690.0
Green Peter	981.75	988.9	1010.0
Foster	637.37	627.9	637.0
Detroit	1522.14	1536.5	1563.5
CANADIAN STORAGE RESERVOIRS			
Mica	2451.73	2474.5	2474.5
Arrow	1397.42	1443.2	1444.0
Duncan	1875.20	1868.2	1892.0

Generation from thermal plants for September are shown below:

<u>Project</u>	<u>Energy</u> <u>1000 KWH</u>	<u>Plant Factor</u> <u>Percent</u>	<u>Capacity</u> <u>1000 KW</u>
Hanford	0	0	852
Trojan	471,722	61.3	1068
Centralia	774,220	81.9	1313

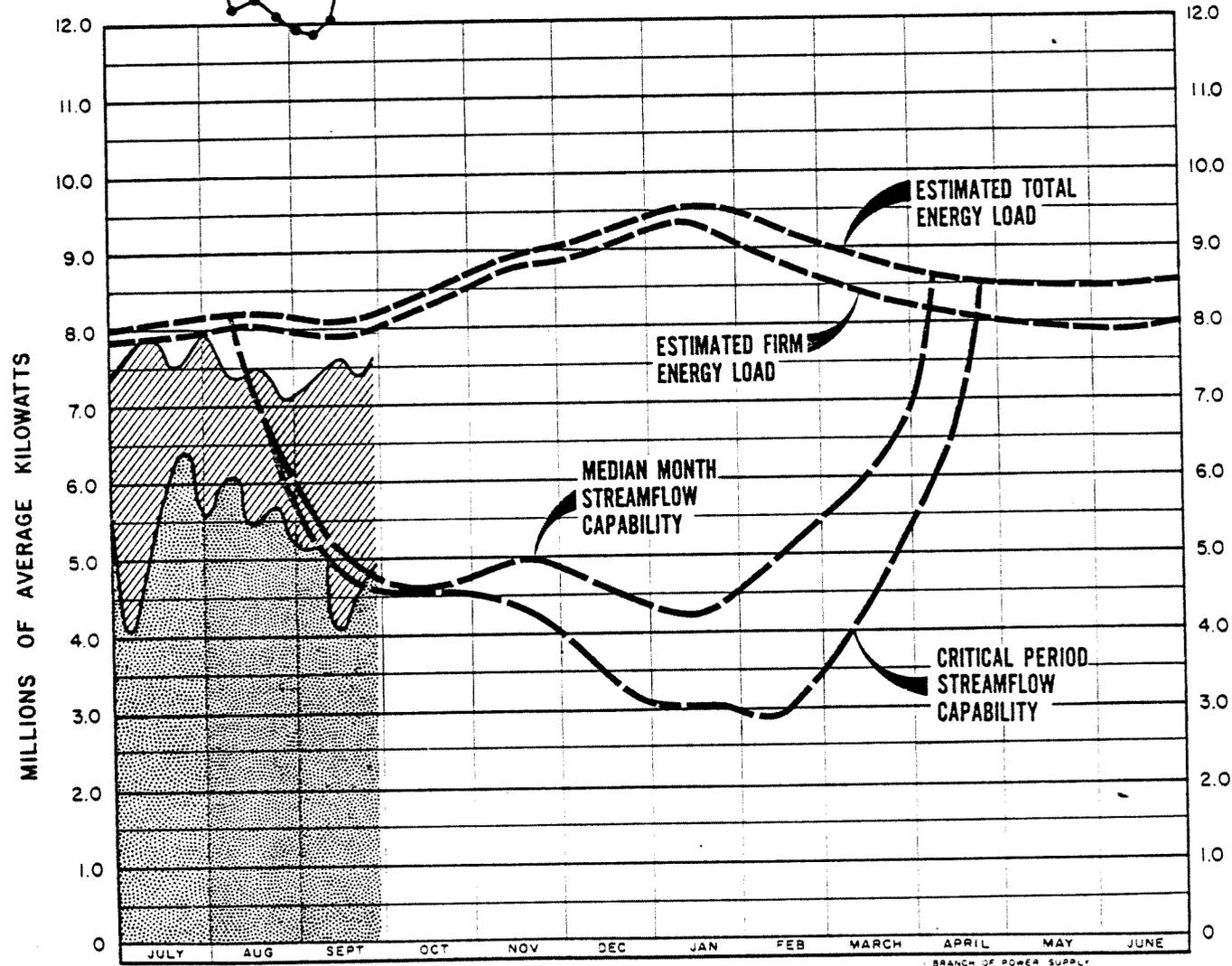
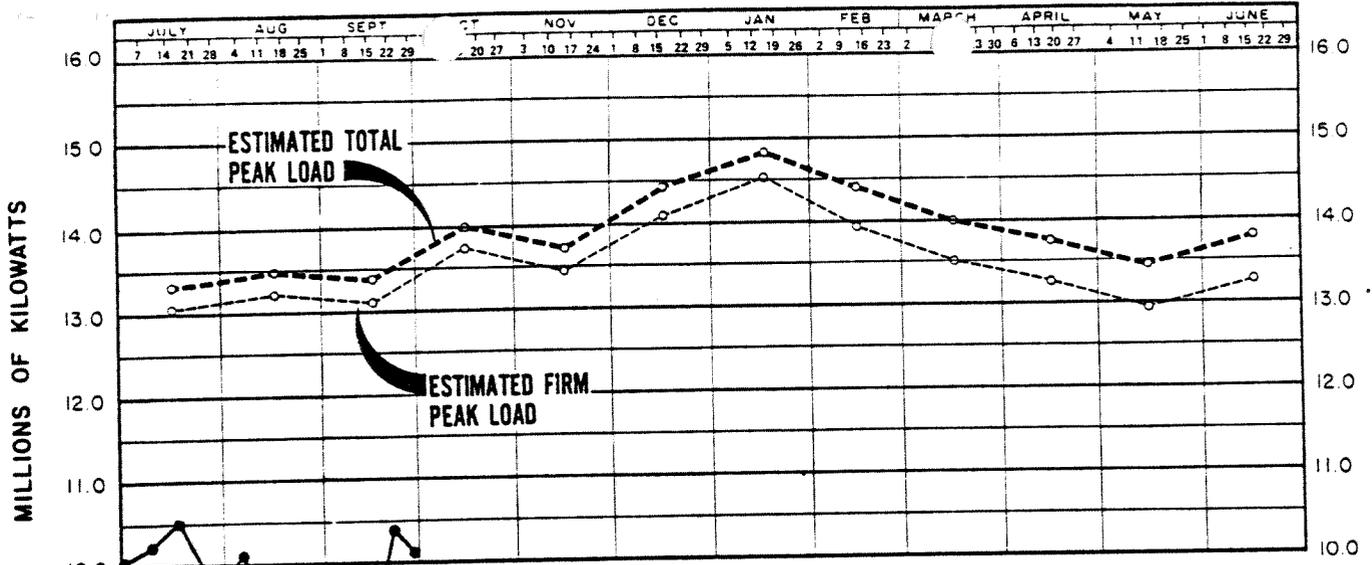
### Streamflows

Showers which began during the last week of August, overlapped in September, producing a September with near normal precipitation across the Columbia Basin, a welcome break in the drought. A few areas, mainly west of the Cascades, even experienced wetter than normal weather. Streamflows responded to the storms resulting in natural flows on the Columbia River at The Dalles, Oregon, of 79,600 cfs for September, or 87 percent of the 1929-68 median. September's natural flow averaged 5300 cfs above the record low set in 1973 and ranked third lowest in the 53-year record dating back to 1925. Natural streamflows of the Columbia River at Grand Coulee and Bonneville compared to critical and median-month are shown below:

STREAMFLOWS  
Average Natural Discharge  
In Cubic Feet Per Second

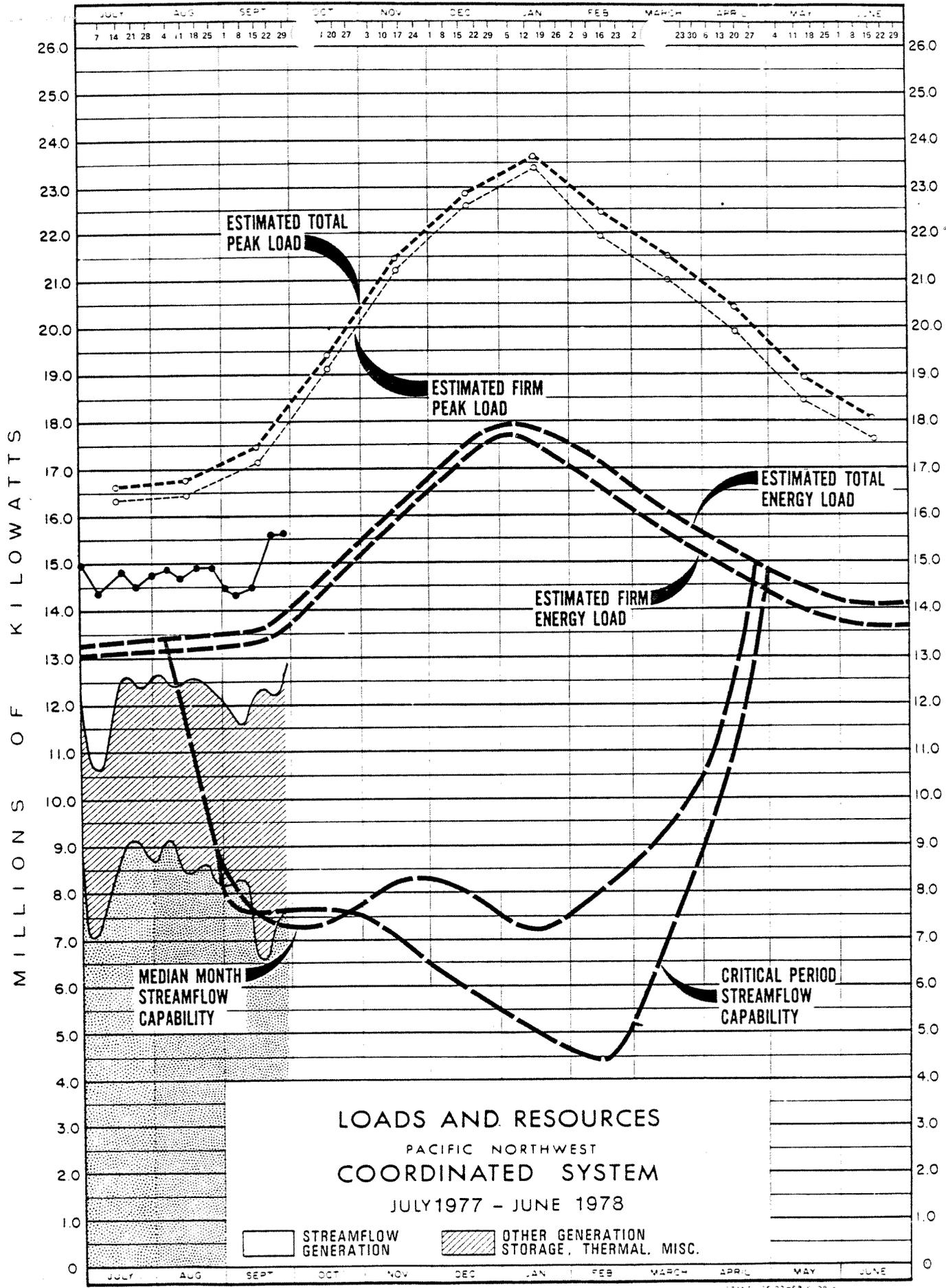
	September 1977			July-September 1977				
	Actual Year	Critical Year	Median Month Year	Actual As Percent of Critical	Actual As Percent of Median	Actual Average	Actual As Percent of Critical	Actual As Percent of Median
Grand Coulee	59,300	60,000	60,610	98.8	97.8	85,300	65.3	74.2
Bonneville	85,400	88,330	94,680	96.7	90.2	109,800	64.2	68.2

BPA-Branch of Power Supply  
October 14, 1977



**LOADS AND RESOURCES**  
**BONNEVILLE POWER ADMINISTRATION**  
 JULY 1977 JUNE 1978

STREAMFLOW GENERATION
  OTHER GENERATION STORAGE THERMAL, MISC.



SEP 22 1977

BONNEVILLE POWER ADMINISTRATION  
Power Situation Statement  
Monthly Summary  
August 1977

~~ECS~~  
~~NEP~~  
~~EW~~  
~~EH~~  
NSB

Code

Power Supply

The adverse power supply outlook remained virtually unchanged during August as drought conditions continued in the Columbia River Basin. Glacial melt from high temperatures in the upper Columbia the first 20 days of the month followed by heavy rainfall over the basin the last 11 days sustained the natural runoff at a near constant level. The natural flow of Columbia River at The Dalles for August was the fourth lowest of a 52-year record.

Coordinated System reservoirs were 12.6 million acre-feet, or about 14.4 billion kilowatthours, below full contents on August 31. On July 31 the deficiency was 14.1 billion kilowatthours. The Coordinated System operating plan shows a draft of 0.8 billion kilowatthours during the last half of August making the August 31 storage deficiency about 13.6 billion kilowatthours below normal operating levels.

Projections of Coordinated System firm loads and resources indicate that all firm loads cannot be served through next winter with recurrence of 1936-37 streamflow conditions. Coordinated System total energy loads were 7.8 percent below the forecast for August reflecting good response to the request for voluntary curtailment. If voluntary curtailment efforts are continued at the August level, service to essential firm loads can be maintained through the winter with a low runoff similar to 1936-37.

The BPA nonfirm industrial load is operating at about 27% of capacity with energy they have purchased from British Columbia utilities. Some area utilities are purchasing energy from outside the area to avoid operation of their high-cost thermal generation and to conserve reservoir storage.

Generation and Load

Federal Columbia River System total loads for the month of August were 25.4% and 13.6% below the peak and energy estimates. Small amounts of the energy stored in California during the fish flow 1977 were returned during August. By the end of the month about 22 percent of the total amount which had been stored in California had been returned.

Pacific Northwest Coordinated System total loads were 9.5 percent below the peak estimate and 7.8 percent below the energy estimate.

Loads and resources for BPA and the Coordinated System are shown on the attached charts. Load data for August 1977 are shown below:

PO 2-2-13

	August 1977*			Jul 77-Aug 77	
	Megawatts	As Percent of Last Month	As Percent Same Month Last Year	Megawatts	As Percent Same Period Last Year
<u>Federal Load</u>					
Peak	10067	95.6	88.8	10526	92.9
Energy	7144	95.5	92.2	7312	96.3
<u>BPA Nonfirm Indus. Load</u>					
Energy	266	102.3	38.3	263	37.9
<u>Coordinated System Load</u>					
Peak	15159	99.5	97.2	15240	97.6
Energy	12444	102.9	97.2	12269	96.4

\*Coordinated System energy data are for the five weeks ending September 1, 1977.

### System Operations

Reservoir elevations as of August 31, 1977, compared with rule curves and full elevations are shown on the following table:

	<u>Elevations in Feet Above Mean Sea Level</u>		
	<u>Actual</u>	<u>Rule Curve</u>	<u>Full</u>
Libby	2410.74	2459.0	2459.0
Hungry Horse	3514.00	3560.0	3560.0
Albeni Falls	2062.06	2062.5	2062.5
Grand Coulee	1288.50	1289.0	1290.0
Dworshak	1549.89	1598.1	1600.0
John Day	265.60	268.0	268.0
Hills Creek	1493.88	1510.0	1541.0
Lookout Point	901.07	904.5	926.0
Cougar	1659.81	1640.9	1690.0
Green Peter	990.43	1001.5	1010.0
Foster	637.33	634.1	637.0
Detroit	1545.09	1558.6	1563.5
CANADIAN STORAGE RESERVOIRS			
Mica	2455.45	2474.5	2474.5
Arrow	1401.22	1443.5	1444.0
Duncan	1891.53	1885.2	1892.0

Generation from thermal plants for July are shown below:

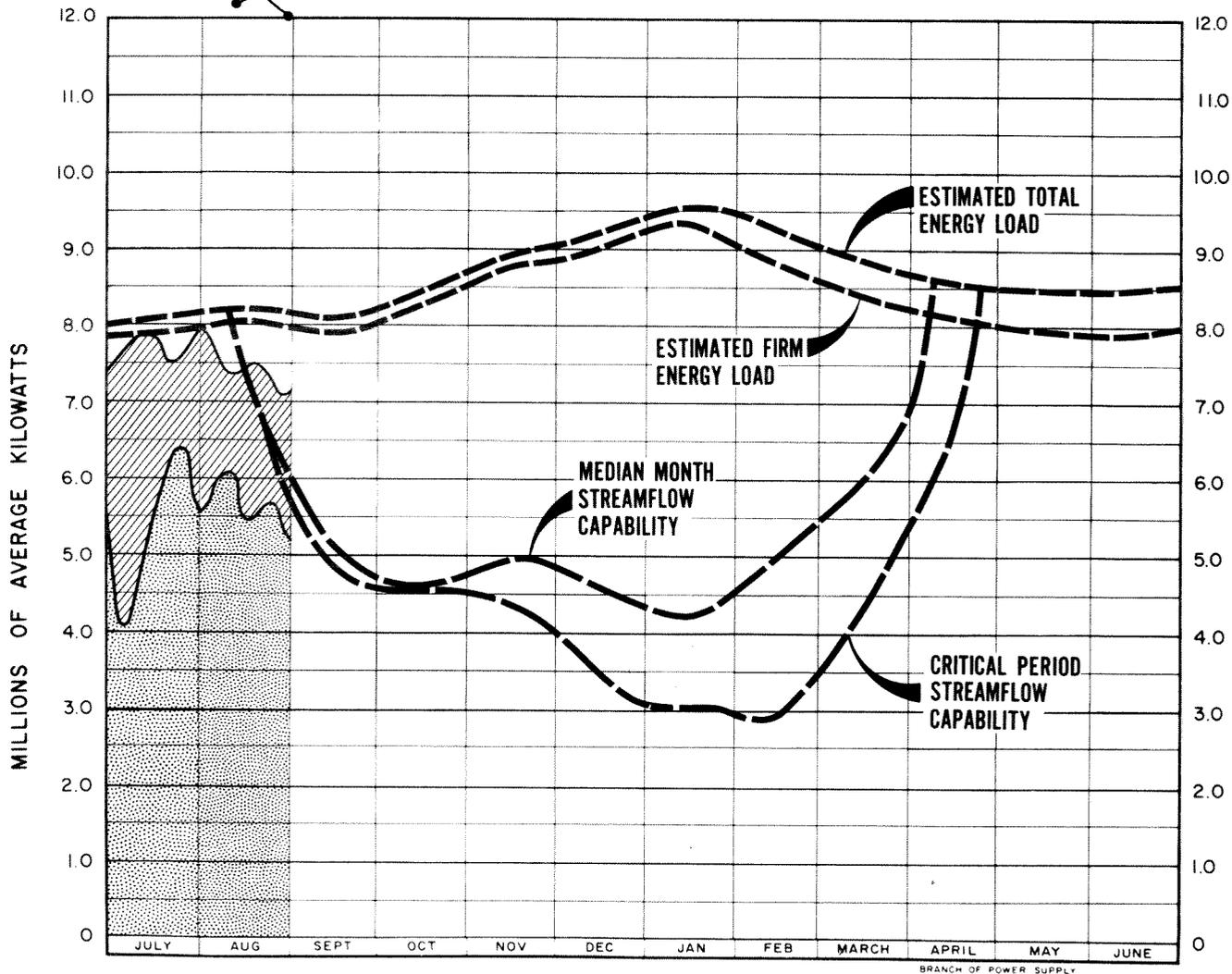
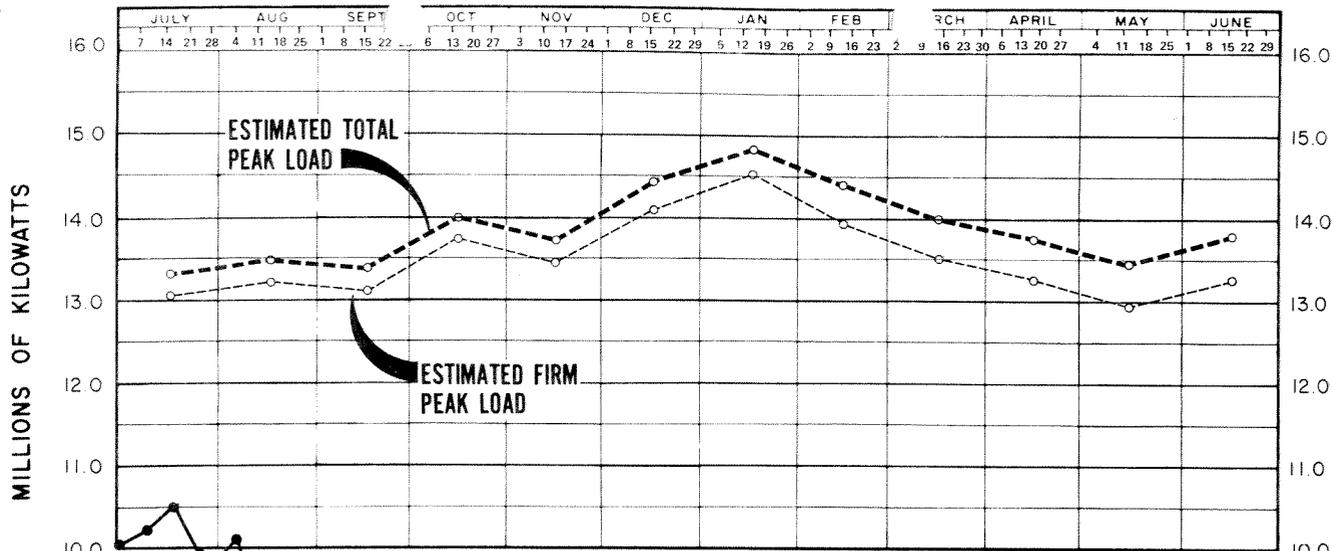
<u>Project</u>	<u>Energy 1000 KWH</u>	<u>Plant Factor Percent</u>	<u>Capacity 1000 KW</u>
Hanford	0	0	852
Trojan	698,383	87.9	1068
Centralia	441,797	45.2	1313

### Streamflows

Weather over the Columbia Basin in August was characterized by near record-breaking heat the first 20 days followed by unseasonably heavy rains during the last 11 days. The hot weather produced glacial melt and some late season snowmelt over British Columbia portions of the basin. The result was water yields summed above The Dalles that were considerably in excess of those produced by a base flow recession. Rises in natural flows were also noted after the 20th due to the widespread rainy weather. Natural streamflows of the Columbia River at Grand Coulee and Bonneville compared to critical and median-month are shown below:

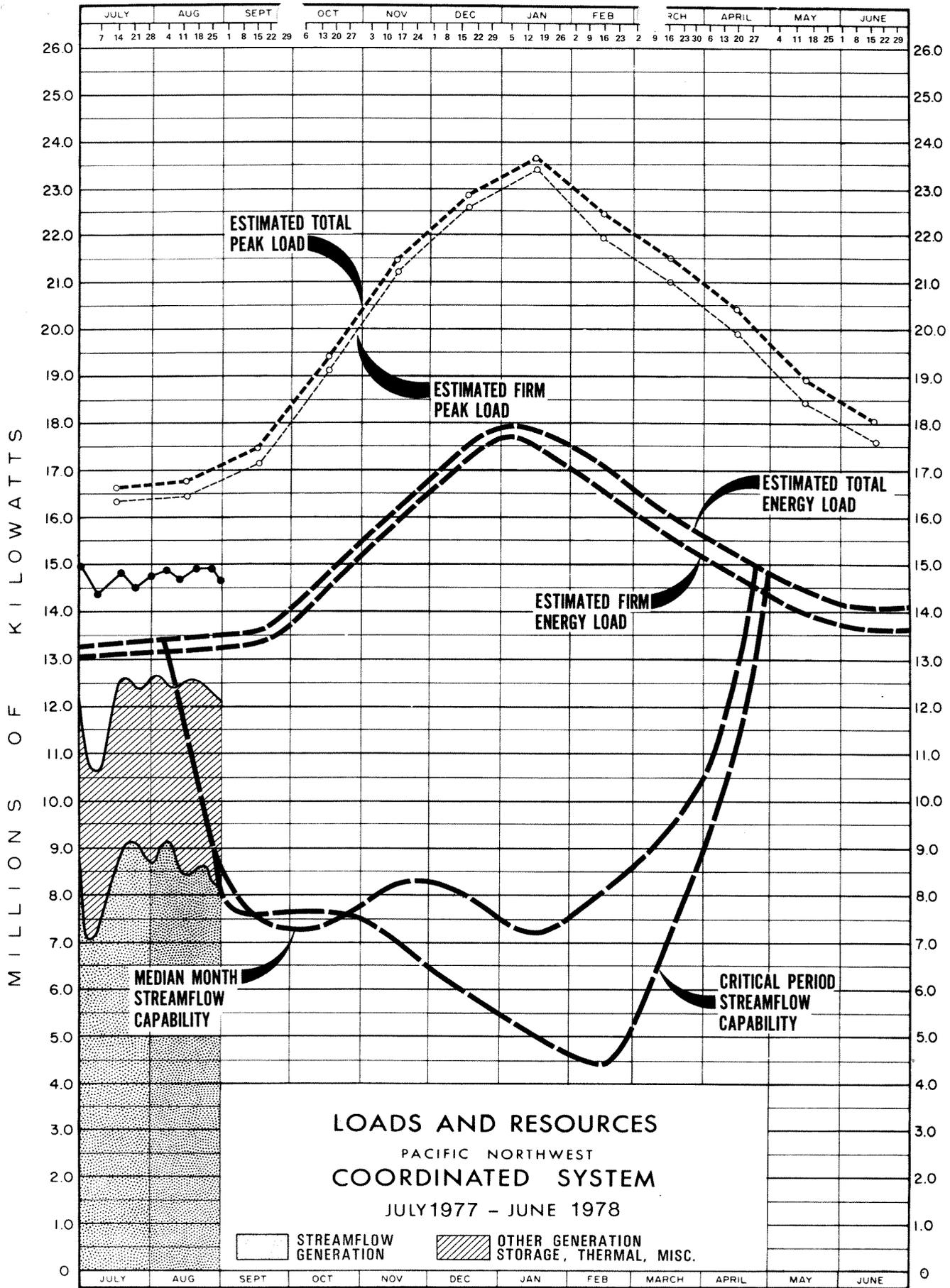
	STREAMFLOWS								
	Average Natural Discharge								
	In Cubic Feet Per Second								
	August 1977					July-August 1977			
	Actual	Critical	Median	Actual As	Actual As	Actual	Actual As	Actual As	
	Year	Year	Month	Percent of	Percent of	Average	Percent of	Percent of	
			Year	Critical	Median		Critical	Median	
Grand Coulee	91,400	104,350	99,880	87.6	91.5	98,000	59.5	69.4	
Bonneville	113,400	136,400	136,000	83.1	83.4	121,600	57.6	63.0	

BPA-Branch of Power Supply  
September 14, 1977



**LOADS AND RESOURCES**  
**BONNEVILLE POWER ADMINISTRATION**  
 JULY 1977 JUNE 1978

STREAMFLOW GENERATION
  OTHER GENERATION STORAGE THERMAL, MISC.



JUL 22 1977

BONNEVILLE POWER ADMINISTRATION  
 Power Situation Statement  
 Monthly Summary  
 June 1977

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Power Supply

Most weather stations in the Columbia Basin reported 20 to 50 percent of montly normal precipitation for June offsetting the above normal precipitation received in May. The National Weather Service July 1 forecast for the January through July volume runoff of the Columbia River at The Dalles was 54.3 million acre-feet (maf). This compares to the June 1 forecast of 57.4 maf and the previous minimum of record, 60.6 maf in 1944.

Load-resource studies made July 1 indicate that Pacific Northwest Coordinated System reservoirs will be short of their normal full contents on July 31 by about 11.1 million acre-feet, or 12.9 billion kilowatthours. Significant load underrun and the return in June and July of energy delivered earlier during Fish Flow 1977 account for the slight increase in the projected July 31 storage deficiency over the June 1 estimate of 11.0 maf.

Generation and Load

Federal Columbia River System total loads for the month of June were 25.5% and 9.4% below the peak and energy estimates. The special fishery operation that began May 9 continued through June 17. Preliminary calculations indicate that water spilled at Columbia River projects during the special fishery operation would have produced an estimated 172,900 megawatthours. Overgeneration produced by fish flow requirements in excess of those required for firm loads on the BPA system amounted to 1,001,000 MWH. When the special fish flow requirements terminated on June 17, the hydraulic operation of the Federal System changed dramatically. Generation previously delivered outside the region was returned at the maximum available rates producing many instances of minimum outflow and generation on the system through the end of June.

Pacific Northwest Coordinated System total loads were 16.7 percent below the peak estimate and 10.6 percent below the energy estimate.

Loads and resources for BPA and the Coordinated System are shown on the attached charts. Load data for June 1977 and July 1976-June 1977 are shown below:

	June 1977*			Jul 76-Jun 77	
	Megawatts	As Percent of Last Month	As Percent Same Month Last Year	Megawatts	As Percent Same Period Last Year
<u>Federal Load</u>					
Peak	9851	93.3	81.3	13654	107.6
Energy	7517	97.7	98.1	8495	102.7
<u>BPA Nonfirm Indus. Load</u>					
Energy	266	97.1	36.5	592	114.5
<u>Coordinated System Load</u>					
Peak	15357	90.1	94.3	22480	110.6
Energy	12652	95.5	96.1	14158	103.6

\*Coordinated System energy data are for the four weeks ending June 30, 1977.

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### System Operations

Reservoir elevations as of June 30, 1977, compared with rule curves and full elevations are shown on the following table:

	<u>Elevations in Feet Above Mean Sea Level</u>		
	<u>Actual</u>	<u>Rule Curve</u>	<u>Full</u>
Libby	2413.55	2450.3	2459.0
Hungry Horse	3535.53	3560.0	3560.0
Albeni Falls	2060.56	2062.5	2062.5
Grand Coulee	1278.30	1288.8	1290.0
Dworshak	1569.93	1600.0	1600.0
John Day	263.60	268.0	268.0
Hills Creek	1525.54	1541.0	1541.0
Lookout Point	912.14	926.0	926.0
Cougar	1695.04	1690.0	1690.0
Green Peter	1010.39	1010.0	1010.0
Foster	637.16	637.0	637.0
Detroit	1567.04	1563.5	1563.5
CANADIAN STORAGE RESERVOIRS			
Mica	2433.85	2454.3	2474.5
Arrow	1410.75	1434.9	1444.0
Duncan	1864.03	1872.0	1892.0

Chief Joseph Unit #17 was released for commercial operation on June 17.

Generation from thermal plants for June are shown below:

<u>Project</u>	<u>Energy</u> <u>1000 KWH</u>	<u>Plant Factor</u> <u>Percent</u>	<u>Capacity</u> <u>1000 KW</u>
Hanford	523,900	85.4	852
Trojan	249,556	32.5	1068
Centralia	564,829	59.7	1313

### Streamflows

The hot and dry weather that prevailed across the Columbia Basin during June largely cancelled out the benefit derived from excess rainfall that occurred during May. June showers which normally produce significant amounts of precipitation across the Columbia Basin failed to materialize resulting in most stations reporting only 20 to 50 percent of their monthly normal.

At month end practically all snow had disappeared from the Columbia Basin with the exception of the extreme northern portion of British Columbia. As a direct result of the diminished snowpack and a lack of significant rainfall, natural streamflows in the Columbia Basin continued well below median levels. Natural

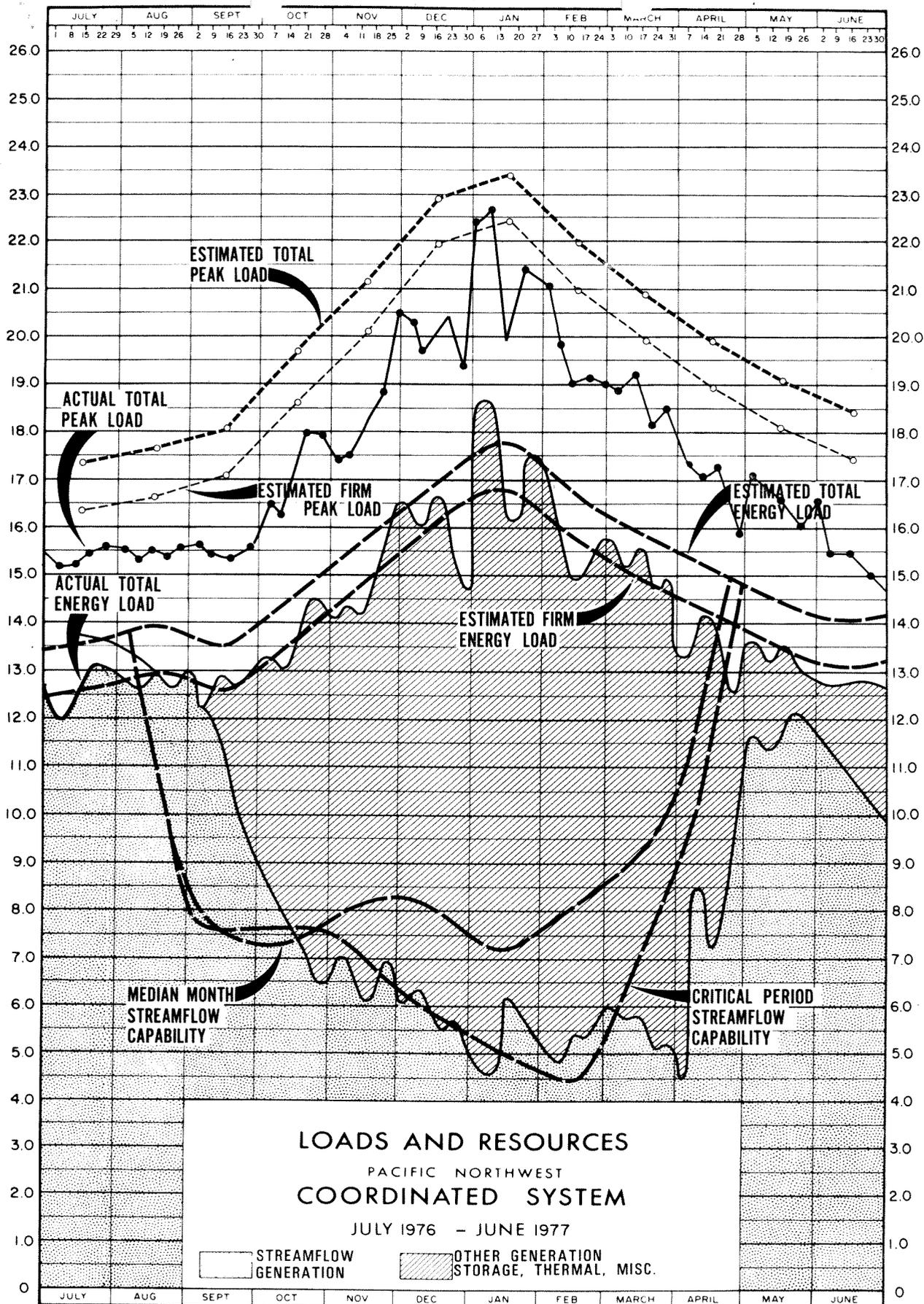
streamflows of the Columbia River at Grand Coulee and Bonneville compared to critical and median-month are shown below:

STREAMFLOWS  
Average Natural Discharge  
In Cubic Feet Per Second

	June 1977			July 1976-June 1977				
	Actual Year	Critical Year	Median Month Year	Actual As Percent of Critical	Actual As Percent of Median	Actual Average	Actual As Percent of Critical	Actual As Percent of Median
Grand Coulee	193,000	271,600	285,200	71.1	67.7	101,500	113.4	99.3
Bonneville	254,400	392,100	433,200	64.9	58.7	148,800	103.1	85.2

BPA-Branch of Power Supply  
July 15, 1977

MILLIONS OF KILOWATTS



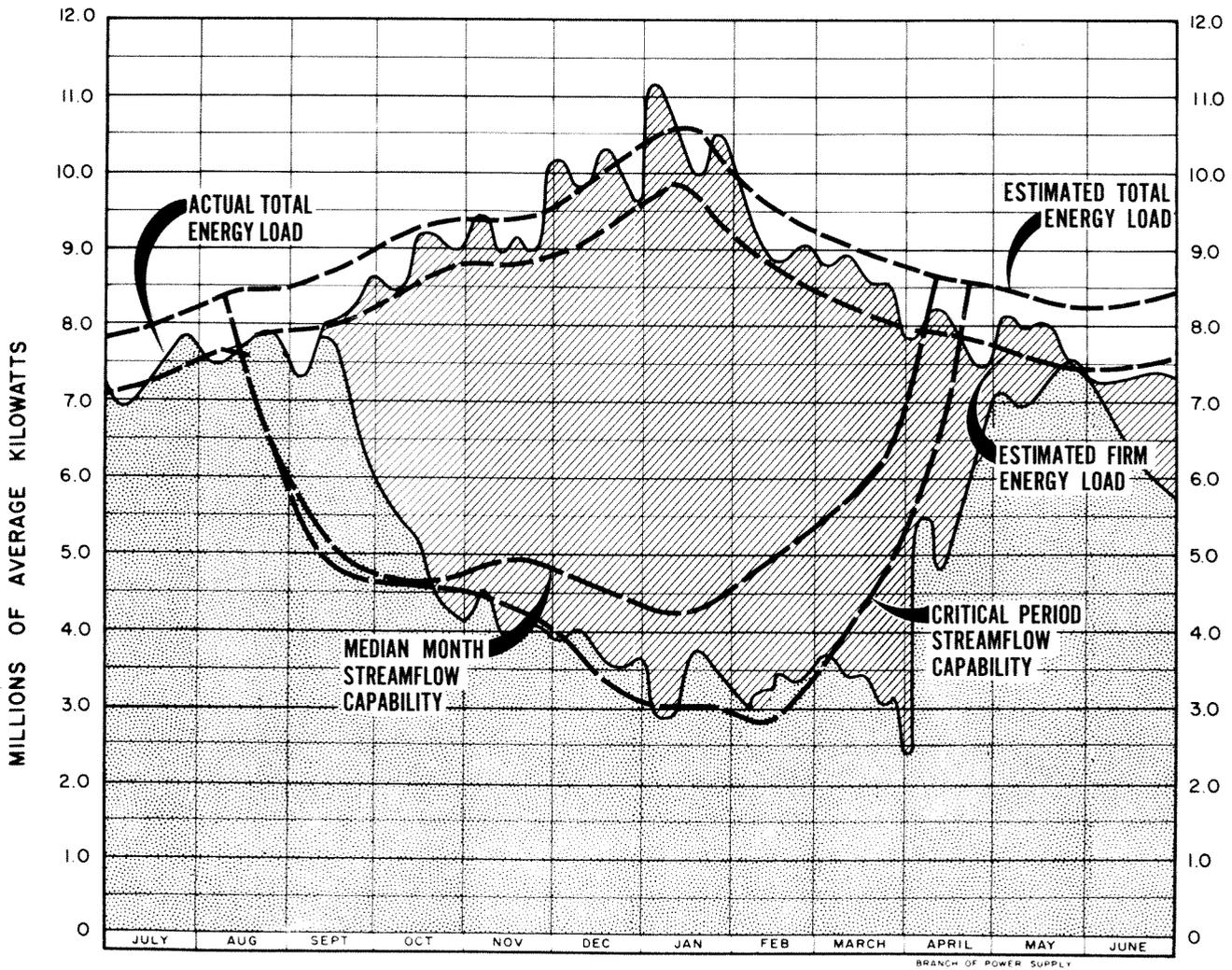
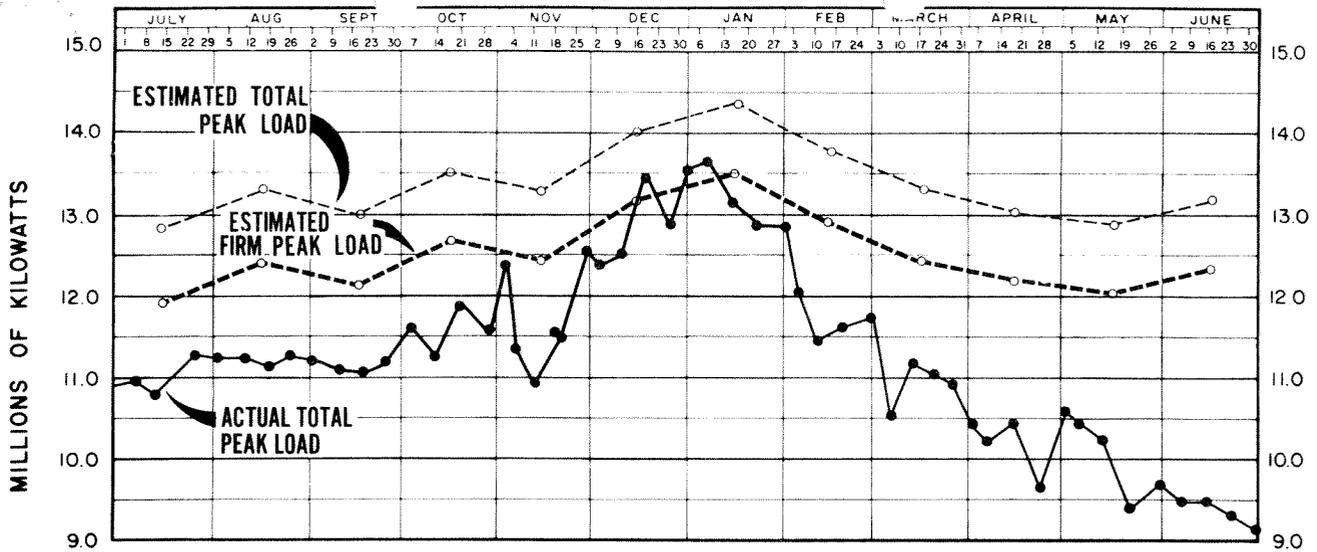
# LOADS AND RESOURCES

## PACIFIC NORTHWEST COORDINATED SYSTEM

JULY 1976 - JUNE 1977

STREAMFLOW GENERATION

OTHER GENERATION STORAGE, THERMAL, MISC.



**LOADS AND RESOURCES**  
**BONNEVILLE POWER ADMINISTRATION**  
 JULY 1976 - JUNE 1977

STREAMFLOW GENERATION
  OTHER GENERATION STORAGE, THERMAL, MISC.

BONNEVILLE POWER ADMINISTRATION  
Power Situation Statement  
Monthly Summary  
May 1977

<del>ECB</del>
<del>NEF</del>
<del>EJW</del>
<del>ELH</del>
<del>NCB</del>
Code

Power Supply

Cool and wet weather in the Pacific Northwest during May reduced the abnormally high power requirements for irrigation and improved reservoir conditions. The June 1 probable January through July volume runoff forecast for the Columbia River at The Dalles, Oregon, is 57.4 million acre-feet (maf), an increase of 3.6 maf from the May 1 forecast. Even with this increase the forecast volume is less than the 60.6 maf minimum of record that occurred in 1944.

Studies of power loads and resources based on the probable June-July volume runoff forecasts at major storage projects indicate that the composite Pacific Northwest Coordinated System reservoirs will be 74 percent full on July 31. This is a deficiency of about 11.0 million acre-feet of reservoir storage, or 12.3 billion kilowatthours of equivalent energy. There is a 25 percent probability that the July 31 storage deficiency will be as great as 15.5 maf and a 25 percent probability that the deficiency will be as low as 6.5 maf. The potential for a severe power shortage next winter still exists. Efforts to reduce use of electricity by at least 10 percent through voluntary curtailment should continue.

Generation and Load

Total loads on the Federal Columbia River Power System during May were 18.3 percent and 8.6 percent below the peak and energy estimates. The special fishery operation designed to provide spills for passage of downstream migrants past mid-Columbia and lower river plants began May 9 and is expected to continue through June 17. The quantity of water spilled during this operation during May would have produced an estimated 104,500 megawatt-hours. This energy is equivalent to approximately 93,000 acre-feet of water which would otherwise have been retained in Columbia River reservoirs. Overgeneration on the Federal System created by this special operation during May amounted to about 575,000 megawatthours. Most of this generation has been stored with B.C. Hydro, California utilities, and with Portland General Electric Company for the replacement of Trojan generation during the plant's maintenance outage. This stored energy, less losses, will be returned after the special fishery operation is completed.

Pacific Northwest Coordinated System total loads were 10.6 percent below the peak estimate and 8.1 percent below the energy estimate. Deliveries of overgeneration to California began May 11 and reached a maximum of 1892 average megawatts on May 26.

Loads and resources for BPA and the Coordinated System are shown on the attached charts. Load data for May 1977 and July 1976-May 1977 are shown below:

70  
2-2-13

	May 1977*			Jul 76-May 77	
	Megawatts	As Percent	As Percent	Megawatts	As Percent
		of	Same Month		Same Period
	Last Month	Last Year	Last Year	Last Year	
<u>Federal Load</u>					
Peak	10555	100.6	88.7	13654	107.6
Energy	7691	97.9	100.8	8582	103.0
<u>BPA Nonfirm Indus. Load</u>					
Energy	274	88.4	42.0	621	120.1
<u>Coordinated System Load</u>					
Peak	17053	98.1	103.0	22480	110.6
Energy	13251	98.9	101.2	14293	104.3

\*Coordinated System energy data are for the five weeks ending June 2, 1977.

#### System Operations

Reservoir elevations as of May 31, 1977, compared with rule curves and full elevations are shown on the following table:

	Elevations in Feet Above Mean Sea Level		
	Actual	Rule Curve	Full
Libby	2383.83	2424.2	2459.0
Hungry Horse	3528.78	3551.3	3560.0
Albeni Falls	2059.20	2061.9	2062.5
Grand Coulee	1253.80	1277.3	1290.0
Dworshak	1564.24	1597.0	1600.0
John Day	267.00	263.9	268.0
Hills Creek	1513.82	1541.0	1541.0
Lookout Point	906.99	926.0	926.0
Cougar	1691.68	1690.0	1690.0
Green Peter	1011.05	1010.0	1010.0
Foster	637.18	637.0	637.0
Detroit	1565.32	1563.5	1563.5
CANADIAN STORAGE RESERVOIRS			
Mica	2417.14	2426.3	2475.0
Arrow	1397.23	1408.2	1444.0
Duncan	1828.85	1848.6	1892.0

Generation from thermal plants for May are shown below:

Project	Energy 1000 KWH	Plant Factor Percent	Capacity 1000 KW
Hanford	510,596	80.5	852
Trojan	0	0	1068
Centralia	430,662	44.1	1313

### Streamflows

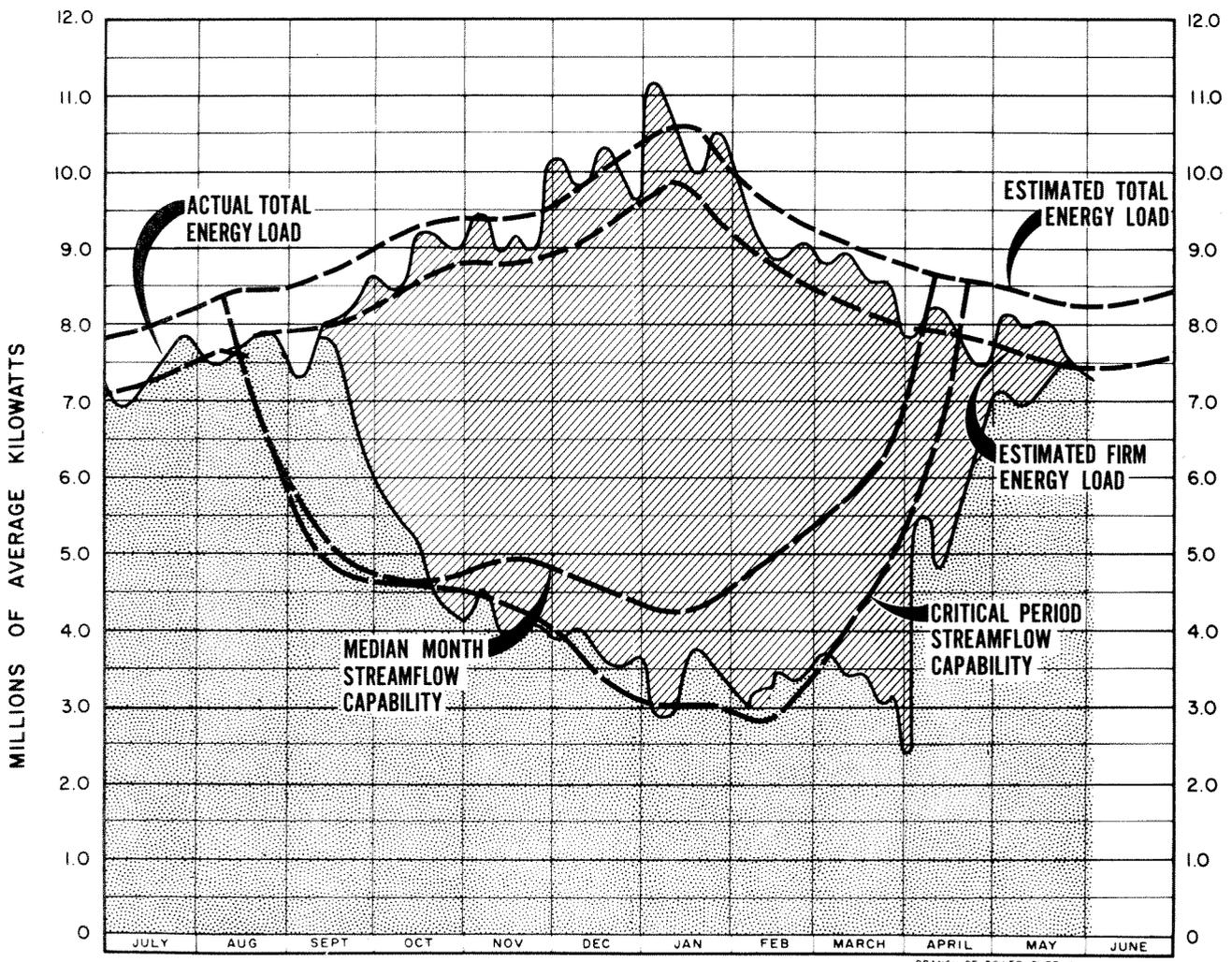
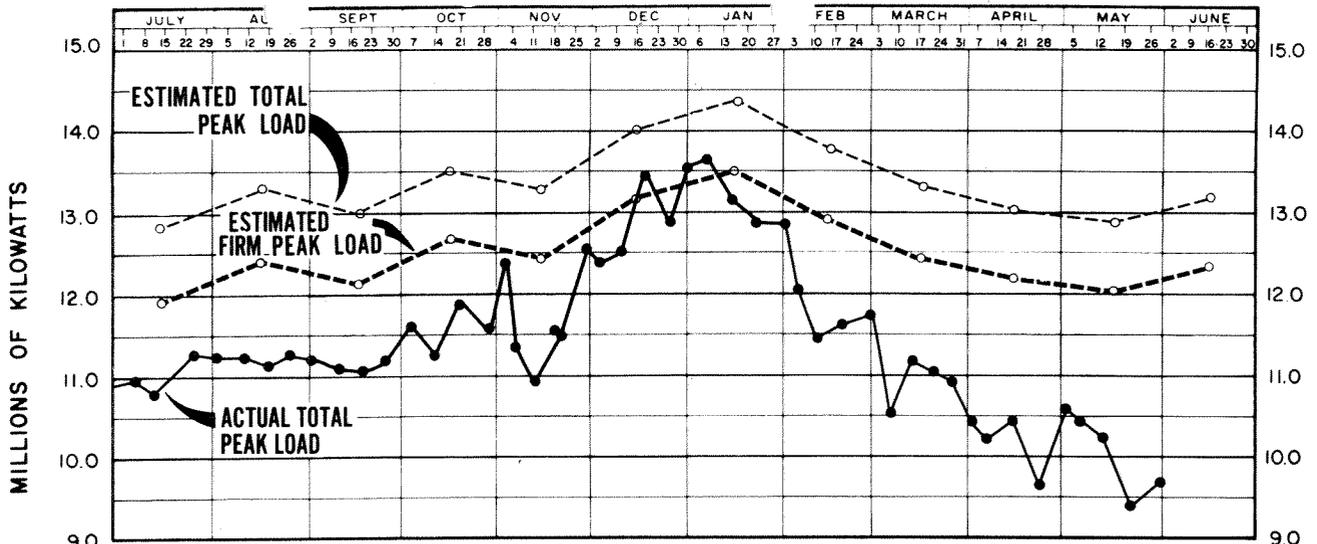
Weather in the Pacific Northwest during May was generally wet and cool. Especially heavy precipitation occurred west of the Cascades where amounts ranged from 175% to 250% of normal. Another portion of the Columbia Basin receiving heavy amounts of precipitation was southeastern Idaho. Some stations there reported as much as 290% of normal for May. The weighted average precipitation for the Columbia Basin above The Dalles, Oregon, was 139% of normal for the month. Temperatures for the month were well below normal throughout the Columbia Basin.

Natural streamflows in the Columbia Basin during May averaged well below median levels due to the cold weather and low snowpacks. Grand Coulee and Bonneville natural flows for the month were less than the lowest May streamflows recorded in the past 48 years. Natural streamflows of the Columbia River at Grand Coulee and Bonneville compared to critical and median-month are shown below:

STREAMFLOWS  
Average Natural Discharge  
In Cubic Feet Per Second

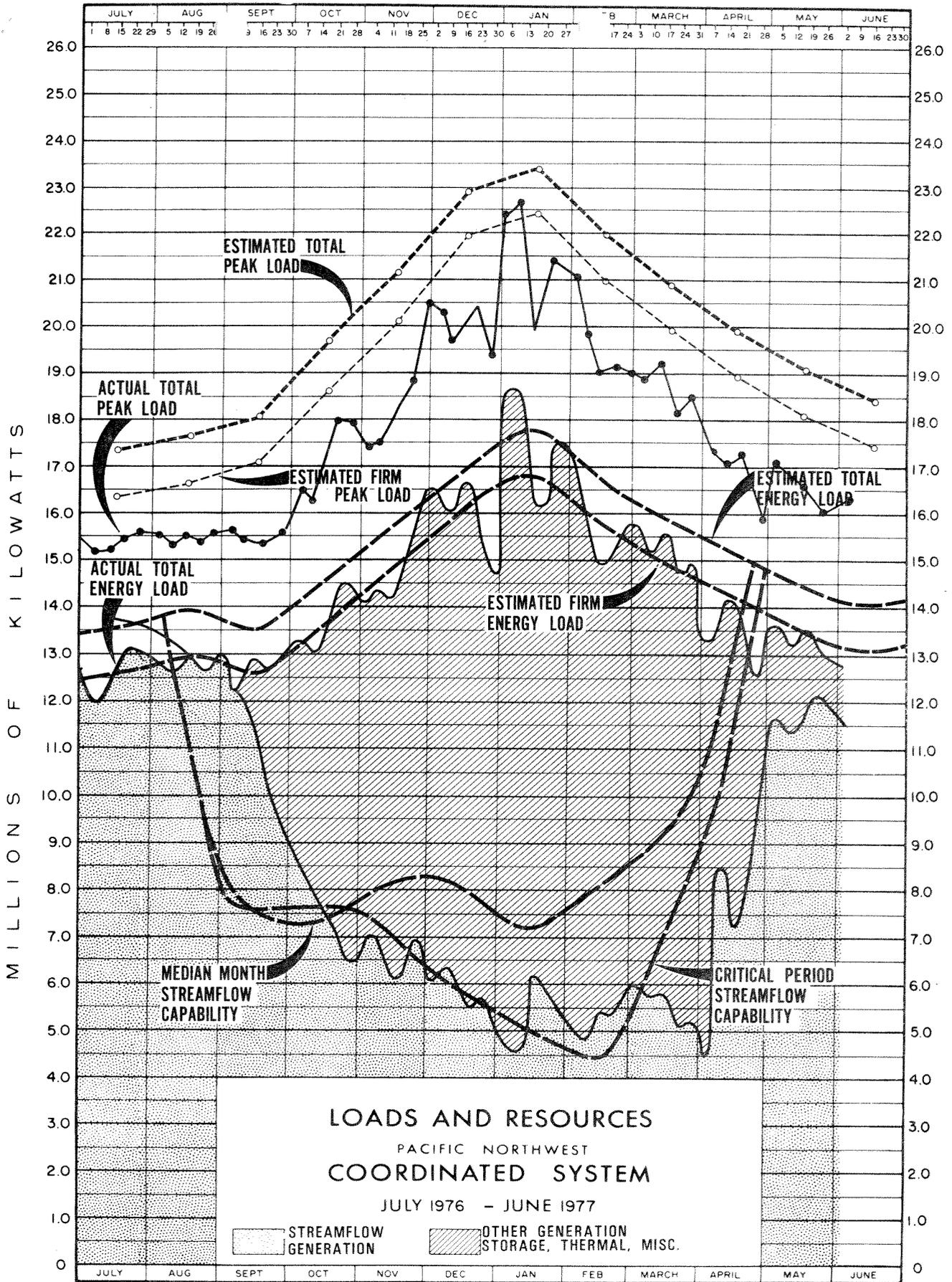
	May			July 1976-May 1977				
	Actual Year	Critical Year	Median Month Year	Actual As Percent of Critical	Actual As Percent of Median	Actual Average	Actual As Percent of Critical	Actual As Percent of Median
Grand Coulee	157,800	174,600	247,600	90.4	63.7	224,700	127.6	108.7
Bonneville	228,000	279,500	394,600	81.6	57.8	139,300	114.1	91.9

BPA-Branch of Power Supply  
June 14, 1977



**LOADS AND RESOURCES**  
**BONNEVILLE POWER ADMINISTRATION**  
 JULY 1976 - JUNE 1977

STREAMFLOW GENERATION    
 OTHER GENERATION STORAGE, THERMAL, MISC.



MAY 17 1977

<del>ECS</del>
<del>NET</del>
<del>EJW</del>
<del>EHH</del>
<del>NCB</del>
Code

BONNEVILLE POWER ADMINISTRATION  
 Power Situation Statement  
 Monthly Summary  
 April 1977

Power Supply

The severe drought of 1976-77 continues to look worse. The May 1 probable January-July runoff of the Columbia River at The Dalles is estimated to be 53.8 million acre-feet (maf), down 4.3 maf from the April 1 forecast of 58.1 maf.

Studies using probable runoff forecasts at The Dalles and major storage projects and estimated firm load requirements indicate that the composite Coordinated System reservoirs will be only 61 percent full on July 31. This is a deficiency of about 16.4 million acre-feet of reservoir storage, or 18.4 billion kilowatthours of equivalent energy. Efforts to conserve energy must be intensified to help alleviate a potential severe shortage next winter.

Generation and Load

Total loads on the Federal Columbia River Power System during April were 19.8 percent and 9.1 percent below the peak and energy estimates. Most of this underrun was due to reductions in nonfirm industrial loads. A combination of Trust Fund purchases previously stored in the Federal System, emergency energy generated from releases from Canadian Treaty storage reservoirs and current purchases from non-Federal high-cost thermal resources are being used to serve the nonfirm portion of the industrial load.

Pacific Northwest Coordinated System total loads were 12.8 percent below the peak estimate and 12.0 percent below the energy estimate. For the second month in a row, the net energy flow on the Pacific Intertie was from south to north, net deliveries averaging 417 megawatts, as Pacific Gas & Electric Company was storing energy in Pacific Northwest reservoirs for return this summer.

Loads and resources for BPA and the Coordinated System are shown on the attached charts. Load data for April 1977 and July 1976-April 1977 are shown below:

	April 1977*			Jul 76-Apr 77	
	Megawatts	As Percent of Last Month	As Percent Same Month Last Year	Megawatts	As Percent Same Period Last Year
<u>Federal Load</u>					
Peak	10471	92.4	90.1	13654	107.6
Energy	7858	93.8	99.0	8673	103.3
<u>BPA Nonfirm Indus. Load</u>					
Energy	310	15.6	56.0	657	136.0
<u>Coordinated System Load</u>					
Peak	17391	90.5	97.6	22480	110.6
Energy	13405	89.0	96.5	14399	104.6

\*Coordinated System energy data are for the four weeks ending April 28, 1977

PO 2-2-13

### System Operations

Reservoir elevations as of April 30, 1977, compared with rule curves and full elevations are shown on the following table:

	Elevations in Feet Above Mean Sea Level		
	<u>Actual</u>	<u>Rule Curve</u>	<u>Full</u>
Libby	2359.60	2399.3	2459.0
Hungry Horse	3504.53	3524.9	3560.0
Albeni Falls	2054.48	2054.2	2062.5
Grand Coulee	1239.75	1234.4	1290.0
Dworshak	1538.56	1560.2	1600.0
John Day	264.70	262.0	268.0
Hills Creek	1482.86	1533.7	1541.0
Lookout Point	874.60	920.0	926.0
Cougar	1638.29	1680.4	1690.0
Green Peter	1001.14	1004.7	1010.0
Foster	636.50	634.8	637.0
Detroit	1535.78	1560.1	1563.5
CANADIAN STORAGE RESERVOIRS			
Mica	2415.06	2417.8	2475.0
Arrow	1395.66	1384.3	1444.0
Duncan	1806.23	1834.2	1892.0

Generation from thermal plants for April are shown below:

<u>Project</u>	<u>Energy</u> <u>1000 KWH</u>	<u>Plant Factor</u> <u>Percent</u>	<u>Capacity</u> <u>1000 KW</u>
Hanford	442,759	72.2	852
Trojan	704,289	91.6	1068
Centralia	829,584	87.8	1313

### Streamflows

April weather was marked by two nearly week-long warm spells, with about two weeks of slightly below normal temperatures in the middle of the month. During the second warm spell many records were set for the highest temperatures so early in the year.

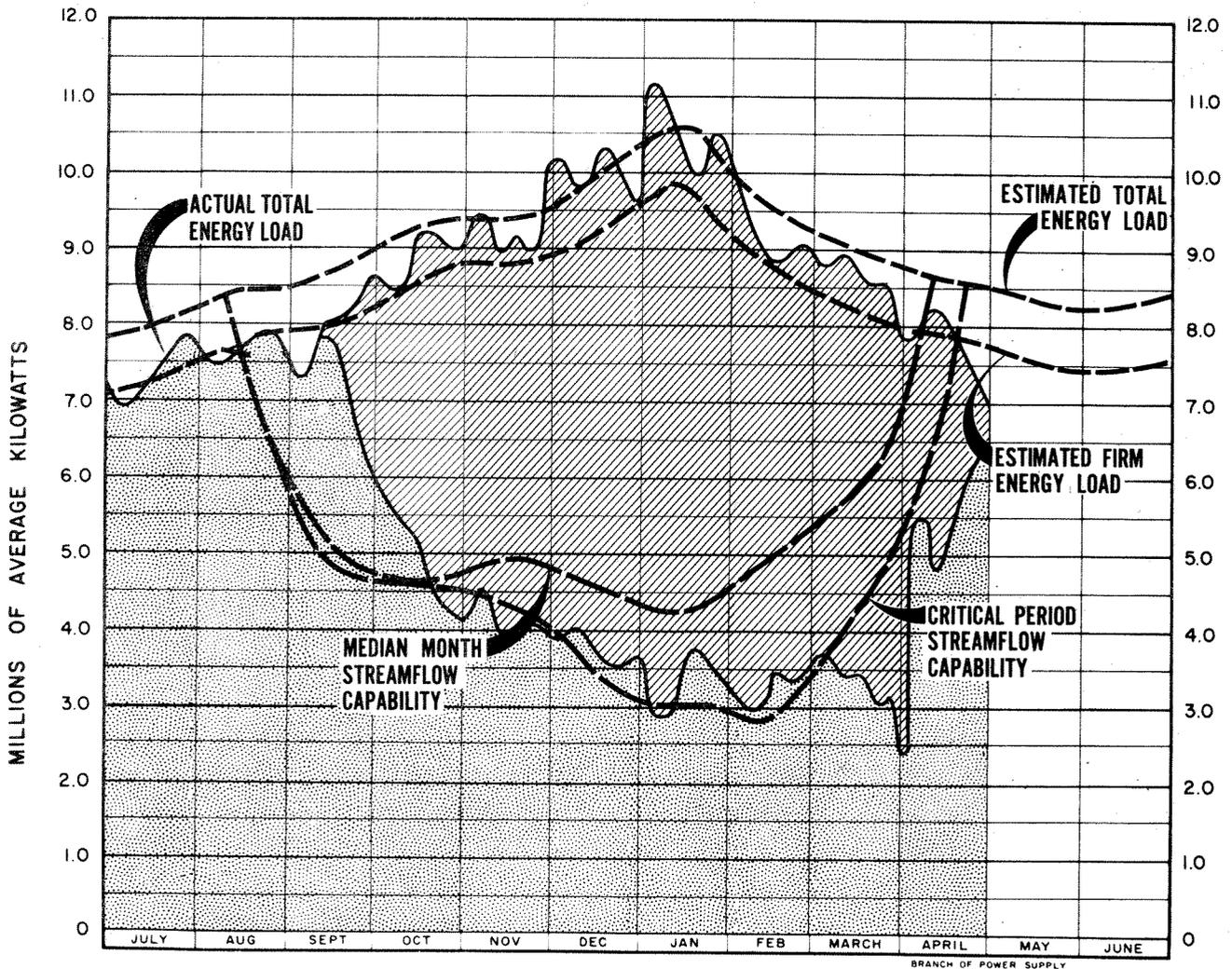
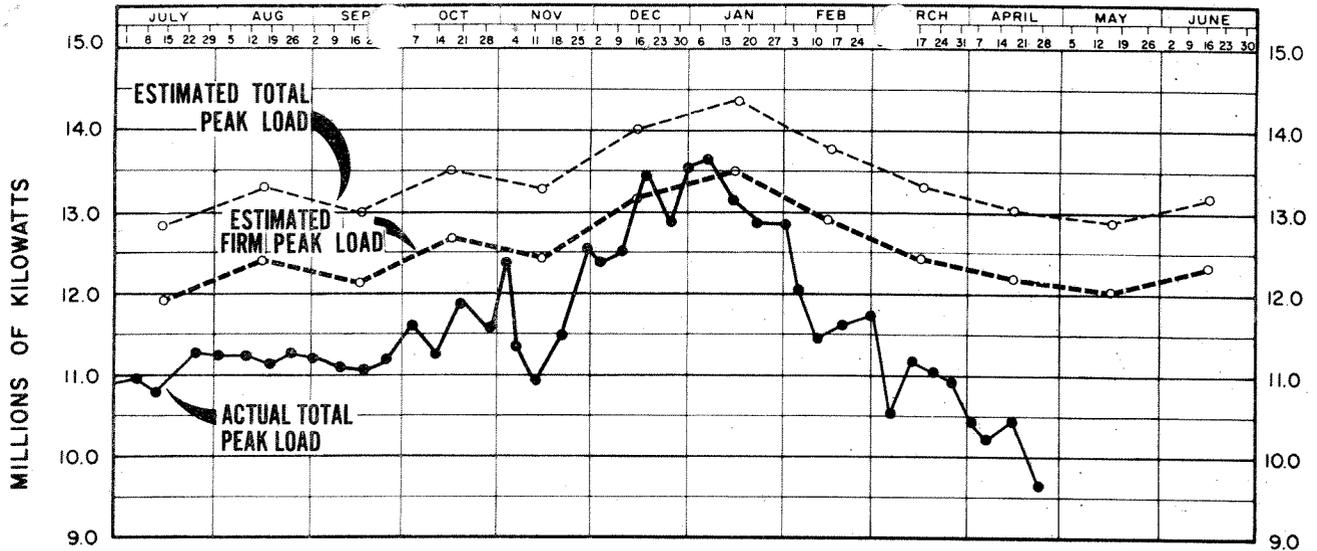
Precipitation during April continued the trend of much below normal which has occurred since September. Precipitation totals for the month in the Pacific Northwest varied from about 20 percent of monthly normals to as much as 50 percent of normal. The drier areas included all of Idaho, Western Montana, and all of Eastern Oregon and Washington. The coastal areas of Washington and Oregon and the Columbia Basin in Canada received the greatest amounts of precipitation.

Natural streamflows began rising sharply on about April 7 as the above normal temperatures melted the mountain snowpack. Natural streamflows peaked temporarily on about April 11 and receded gradually until another period of warm weather began increasing flows again on April 22. Flows were continuing to rise at the end of the month when natural streamflow at both Grand Coulee and Bonneville had reached levels above the critical period streamflow and about 75 percent of median streamflows for that date. Natural streamflows of the Columbia River at Grand Coulee and Bonneville compared to critical and median-month are shown below:

STREAMFLOWS  
Average Natural Discharge  
In Cubic Feet Per Second

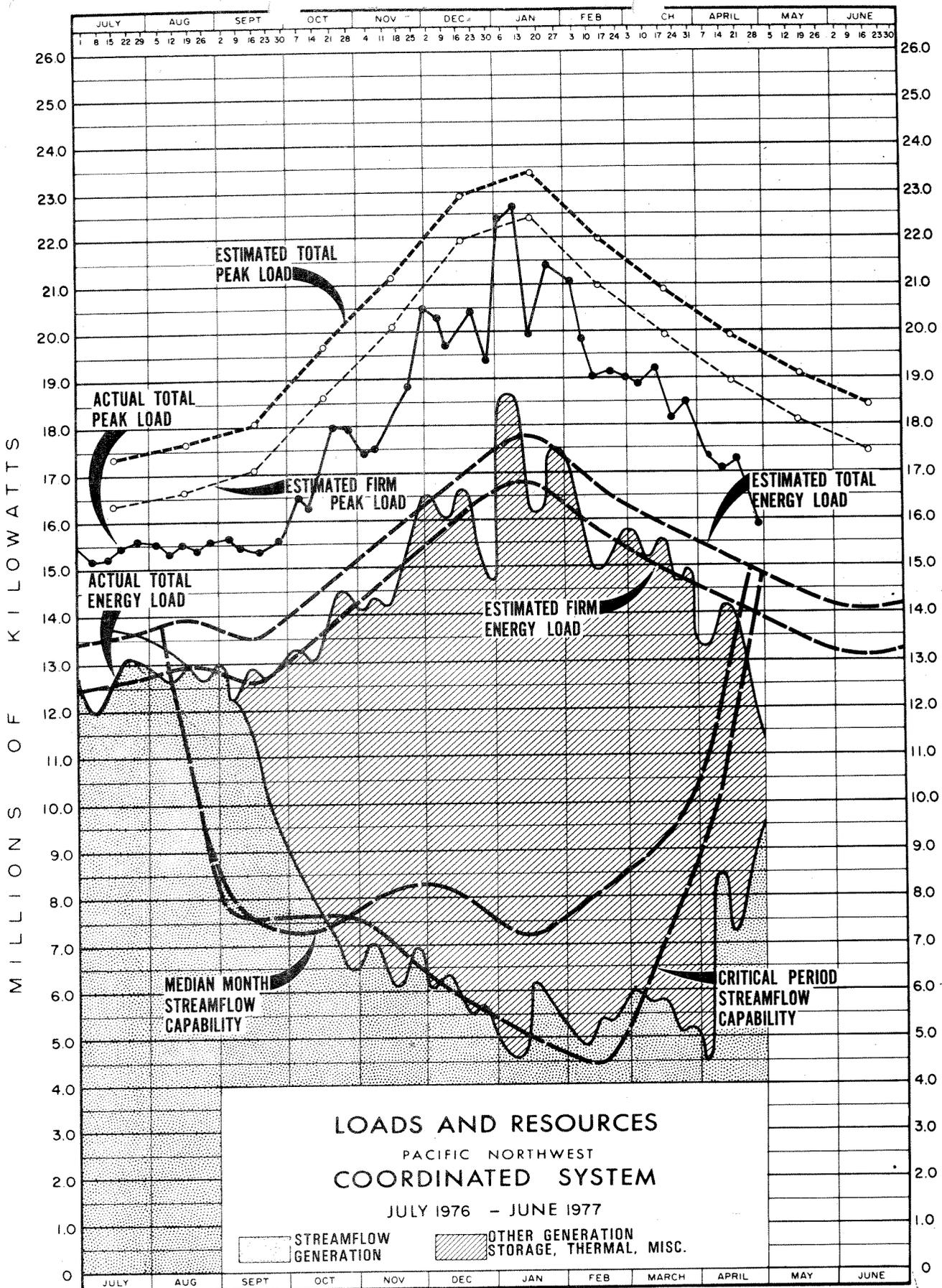
	April			July 1976-April 1977				
	Actual Year	Critical Year	Median Month	Actual As Percent of Critical	Actual As Percent of Median	Actual Average	Actual As Percent of Critical	Actual As Percent of Median
Grand Coulee	68,600	48,870	118,300	140.3	58.0	86,700	138.1	125.1
Bonneville	117,700	107,300	230,600	109.7	51.0	130,300	122.8	102.8

BPA-Branch of Power Supply  
May 10, 1977



**LOADS AND RESOURCES**  
**BONNEVILLE POWER ADMINISTRATION**  
 JULY 1976 - JUNE 1977

STREAMFLOW GENERATION    
 OTHER GENERATION STORAGE, THERMAL, MISC.



PO 2-2-13

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BONNEVILLE POWER ADMINISTRATION  
Power Situation Statement  
Monthly Summary  
October 1976

Power Supply

BPA discontinued nonfirm energy deliveries to investor-owned utilities and industrial customers midnight October 31, 1976. There is sufficient energy to serve these requirements for several months from firm energy purchased from BPA and from non-Federal sources earlier in the year. Studies indicate that secondary energy service can be restored by late November or early December under the most probable November load and resource conditions.

Generation and Load

Federal load for October was 12.2 percent and 2.9 percent below the peak and energy estimates, respectively. The Federal energy load estimates for the period September 1976 through March 1977 were revised to include firm energy sales not included in the original estimates. The energy load estimate on the BPA loads and resources chart reflects this revision.

During October a total of 1,847,308 megawatthours of surplus energy was marketed to the Southwest by Pacific Northwest utilities. No Federal surplus energy was marketed outside the Pacific Northwest during the month. Firm sales to the Southwest totalled 370,828 megawatthours. Line loadings, although down from past months, still remained high for this time of year. The AC and DC lines were loaded at 85.2 and 92.2 percent of available capacity.

The Pacific Northwest Coordinated System total load was 8.3 percent below the peak estimate and 6.0 percent below the energy estimate for the month. Loads and resources for BPA and the Coordinated System are shown on the attached charts. Both charts have been revised to show only streamflow generation plus other generation required to meet the load. Other resources are storage, thermal and miscellaneous generation.

	October 1976*		Jul 76-Oct 76	
	Megawatts	As Percent of Last Month	As Percent Same Month Last Year	As Percent Same Period Last Year
<u>Federal Load</u>				
Peak	11877	104.7	105.4	105.4
Energy	9010	111.2	107.9	102.4
<u>BPA Nonfirm Indus. Load</u>				
Energy	752	107.6	156.0	160.3
<u>Coordinated System Load</u>				
Peak	18025	115.4	105.1	105.1
Energy	13698	107.8	106.1	107.8

\*Coordinated System energy data are for the four weeks ending October 28, 1976.

### System Operations

Reservoir elevations as of October 31, 1976, compared with rule curves and full elevations are shown in the table below:

	<u>Elevations in Feet Above Mean Sea Level</u>		
	October 31, 1976		
	<u>Actual</u>	<u>Rule Curve</u>	<u>Full</u>
Libby	2443.40	2438.3	2459.0
Hungry Horse	3546.38	3540.3	3560.0
Albeni Falls	2052.71	2054.0	2062.5
Grand Coulee	1288.78	1289.0	1290.0
Dworshak	1581.45	1571.2	1600.0
John Day	269.80	263.9	268.0
Hills Creek	1471.99	1454.7	1541.0
Lookout Point	862.87	858.8	926.0
Cougar	1600.10	1554.1	1690.0
Green Peter	955.86	964.8	1010.0
Foster	621.71	621.9	637.0
Detroit	1493.37	1503.0	1563.5
CANADIAN STORAGE RESERVOIRS			
Mica	2471.46	2470.5	2475.0
Arrow	1437.18	1428.9	1444.0
Duncan	1869.39	1885.0	1892.0

At midnight October 31, BPA nonfirm energy deliveries to investor-owned utilities and BPA industrial customers were discontinued, although Federal reservoirs were substantially above their energy content curves. This action was required to assure delivery of firm energy under commitments made after the energy content curves were developed.

The Hanford steamplant returned to service for the first time this season on October 6. After experiencing problems which required several shutdowns, it returned to service on October 17 and operated for the balance of the month. Generation for the month totalled 250,364 megawatthours.

Centralia operated near rated capability during the month with only minor difficulty. The plant generated a total of 778,870 megawatthours during October.

Trojan operated intermittently during the first half of the month and then was taken out of service on October 18 for the remainder of the month. Net plant production for the month was 193,159 megawatthours.

### Streamflows

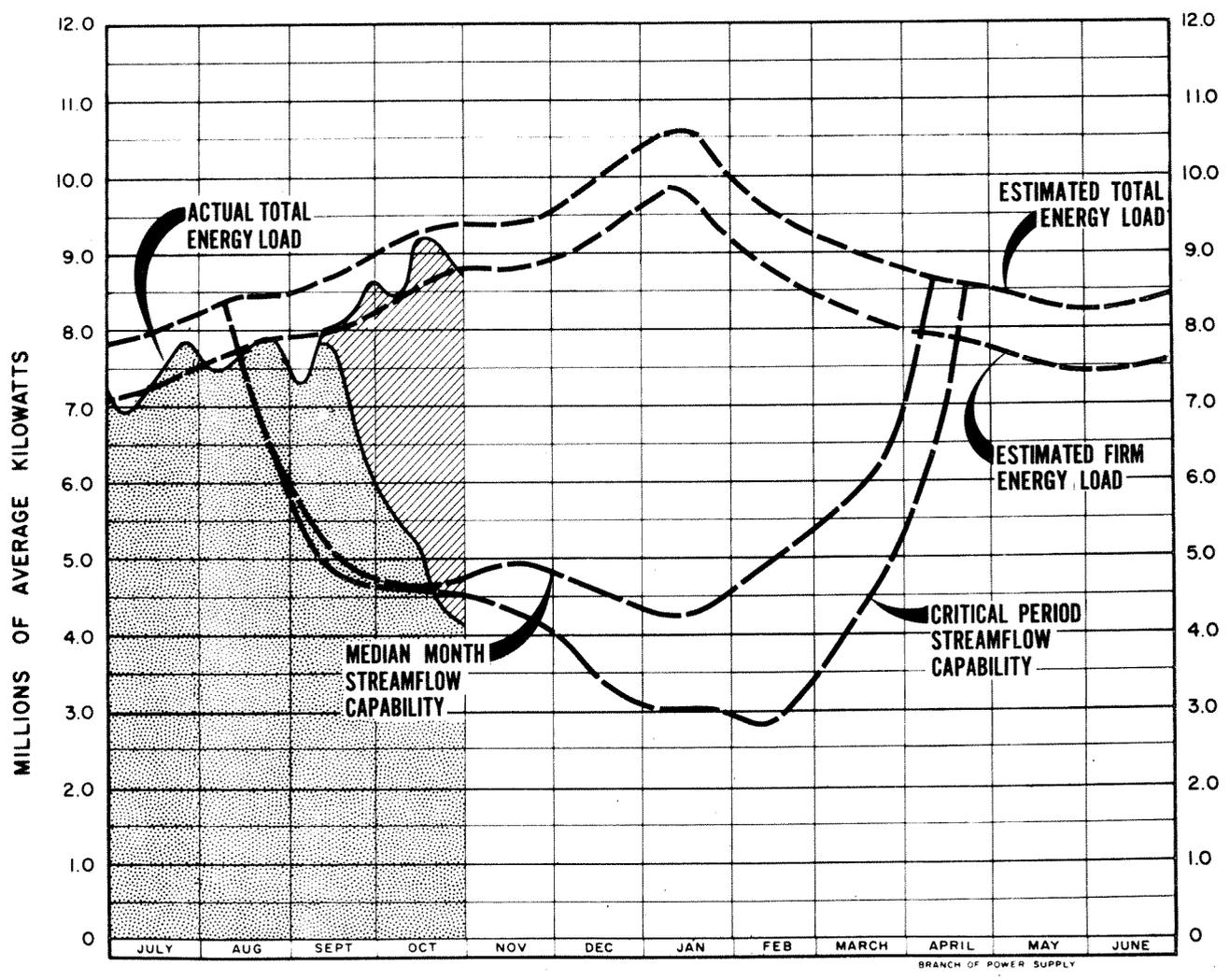
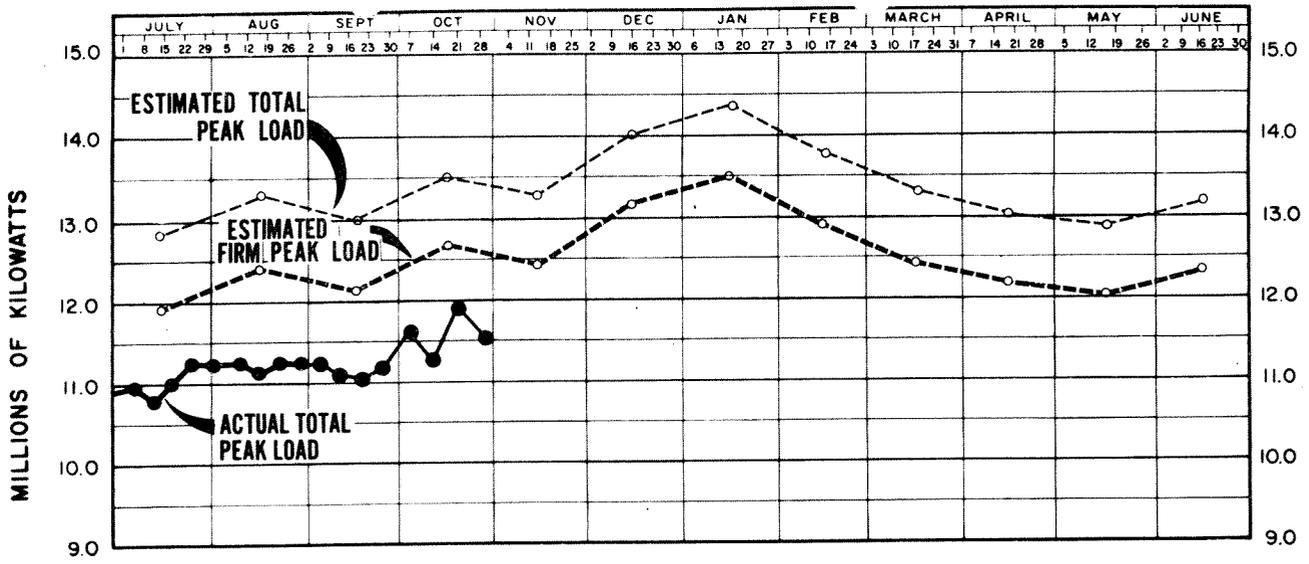
Precipitation totals for the month of October ranged from about 30 percent of normal west of the cascades and across the Upper Columbia Basin in

Canada to about 50 to 60 percent of normal in the Lower Snake River Basin. Load center temperatures were only slightly above normal for the month.

Natural streamflows in the Columbia River Basin fell at an extremely rapid rate during the month but still averaged well above median. Grand Coulee natural streamflows which had been running about 163 percent of median at the beginning of the month dropped below median by October 25. Natural flows at Grand Coulee and The Dalles experienced the most rapid recession of the last 48 years of record from the September average runoff to the October average runoff. The previous maximum recession at Grand Coulee was 36 kcfs in 1954 compared to 59 kcfs this year. At The Dalles the previous maximum recession was 37 kcfs in 1954 compared to 64 kcfs this year. Comparisons of current discharges with critical year and median month are shown in the following tabulation:

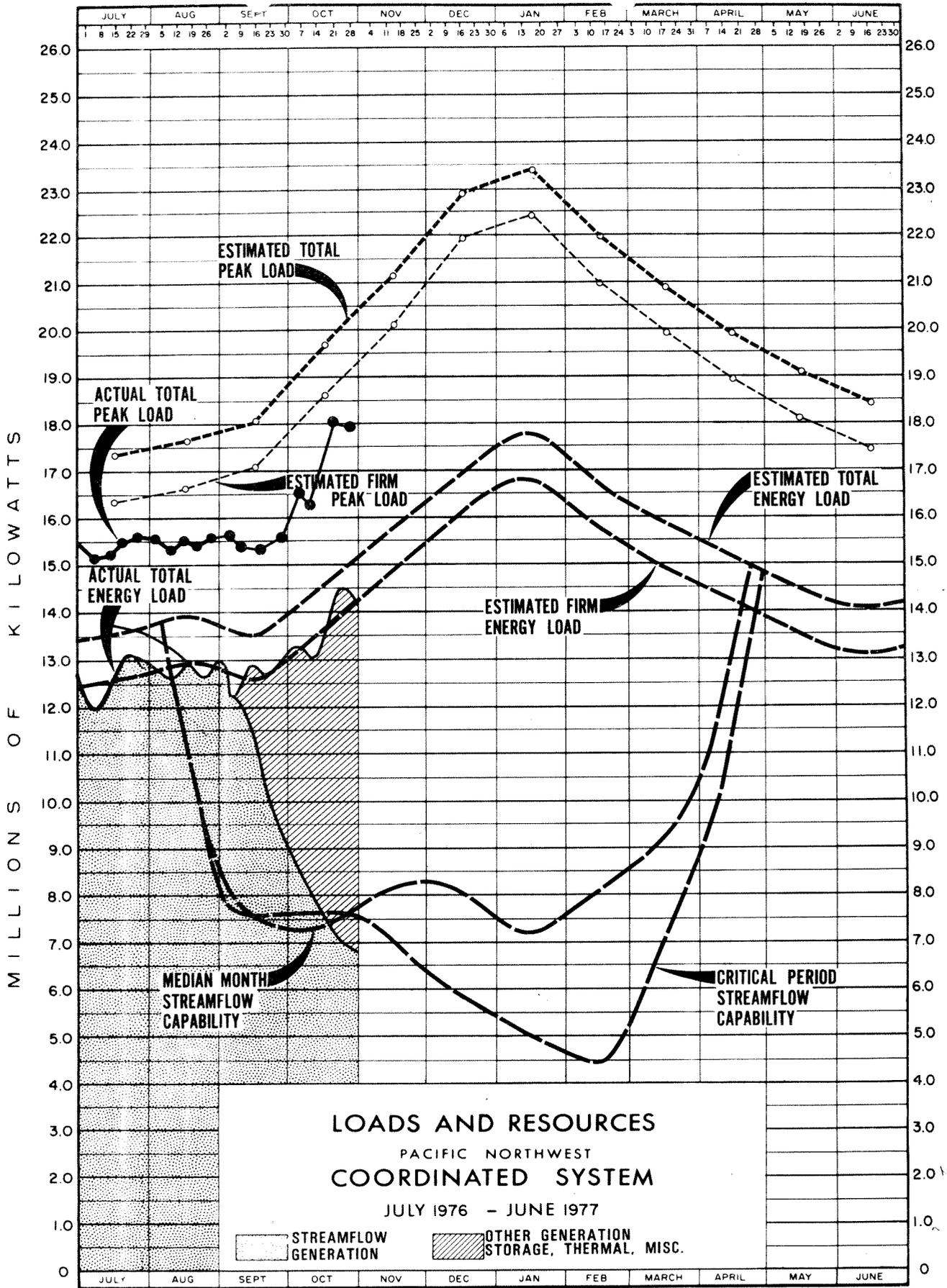
STREAMFLOWS  
Average Natural Discharge  
In Cubic Feet Per Second

	October			July 1976-October 1976				
	Actual Year	Critical Year	Median Month	Actual As Percent of Critical	Actual As Percent of Median	Actual Average	Actual As Percent of Critical	Actual As Percent of Median
Grand Coulee	54,600	47,870	45,790	114.1	119.2	156,000	142.1	161.7
Bonneville	91,200	84,680	80,290	107.7	113.6	208,300	139.6	146.4



**LOADS AND RESOURCES**  
**BONNEVILLE POWER ADMINISTRATION**  
 JULY 1976 - JUNE 1977

STREAMFLOW GENERATION
  OTHER GENERATION STORAGE, THERMAL, MISC.



AUG 19 1976

BONNEVILLE POWER ADMINISTRATION  
Power Situation Statement  
Monthly Summary  
July 1976

~~ECS~~  
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EJW  
Code

Power Supply

The high residual snowpack that has persisted in the upper Columbia continues to generate unusually high streamflows. Forecasts indicate that surplus sales to the Southwest will decline gradually during the first two weeks of August. Streamflows are expected to be sufficient, however, to carry all Northwest secondary markets through August.

Generation and Load

Federal load for July was 12.0 percent and 7.8 percent below the peak and energy estimates, respectively.

During July the Federal System and Pacific Northwest utilities delivered a total of 2,681,839 megawatthours of surplus energy to the Southwest. BPA delivered 2,047,452 megawatthours of the total surplus energy. Firm sales to the Southwest totalled 370,669 megawatthours. During July the Intertie was loaded to 99.9 percent of its available capacity. Both total deliveries of energy and total surplus sales again exceeded all previous months. Comparing this month's deliveries with those of July 1975 show an increase in total deliveries of 138 percent and surplus deliveries up 175 percent. A-C deliveries were 133 percent of last years while the D-C was 125 percent.

The Pacific Northwest Coordinated System total load was 10.1 percent below the peak estimate and 6.9 percent below the energy estimate for the month. Loads and resources for BPA and the Coordinated System are shown on the attached charts.

	July 1976*	
	As Percent of Last Month	As Percent of Last Year
<u>Federal Load</u>		
Peak	11267	93.0
Energy	7445	97.1
<u>BPA Nonfirm Industrial Load</u>		
Energy	694	95.3
<u>Coordinated System Load</u>		
Peak	15616	95.9
Energy	12668	96.2

\*Coordinated System energy data are for the four weeks ending July 29, 1976.

### System Operations

Reservoir elevations as of July 31, 1976, compared with rule curves and full elevations are shown in the table below:

	<u>Elevations in Feet Above Mean Sea Level</u>		
		<u>July 31, 1976</u>	
	<u>Actual</u>	<u>Rule Curve</u>	<u>Full</u>
Libby	2458.98	2459.0	2459.0
Hungry Horse	3560.62	3560.0	3560.0
Albeni Falls	2062.45	2062.5	2062.5
Grand Coulee	1290.00	1290.0	1290.0
Dworshak	1599.65	1600.0	1600.0
John Day	266.50	268.0	268.0
Hills Creek	1541.01	1533.6	1541.0
Lookout Point	922.87	924.1	926.0
Cougar	1688.25	1671.1	1690.0
Green Peter	1007.93	1004.5	1010.0
Foster	636.84	637.0	637.0
Detroit	1562.01	1563.5	1563.5

#### CANADIAN STORAGE RESERVOIRS

Mica	2473.20	2475.0	2475.0
Arrow	1445.90	1444.0	1444.0
Duncan	1891.94	1892.0	1892.0

All storage reservoirs were full at months end with the exception of some of the Willamette reservoirs which were being drafted for pollution control also the two top feet of storage at Mica remained to be filled.

Hanford continues out of service.

Trojan was out of service the entire month for maintenance. It is expected that the plant will be back on line the week of August 16.

Unit #2 at Centralia returned to service August 3 from a 3 month maintenance period. The plant generated 182,481 megawatthours during July.

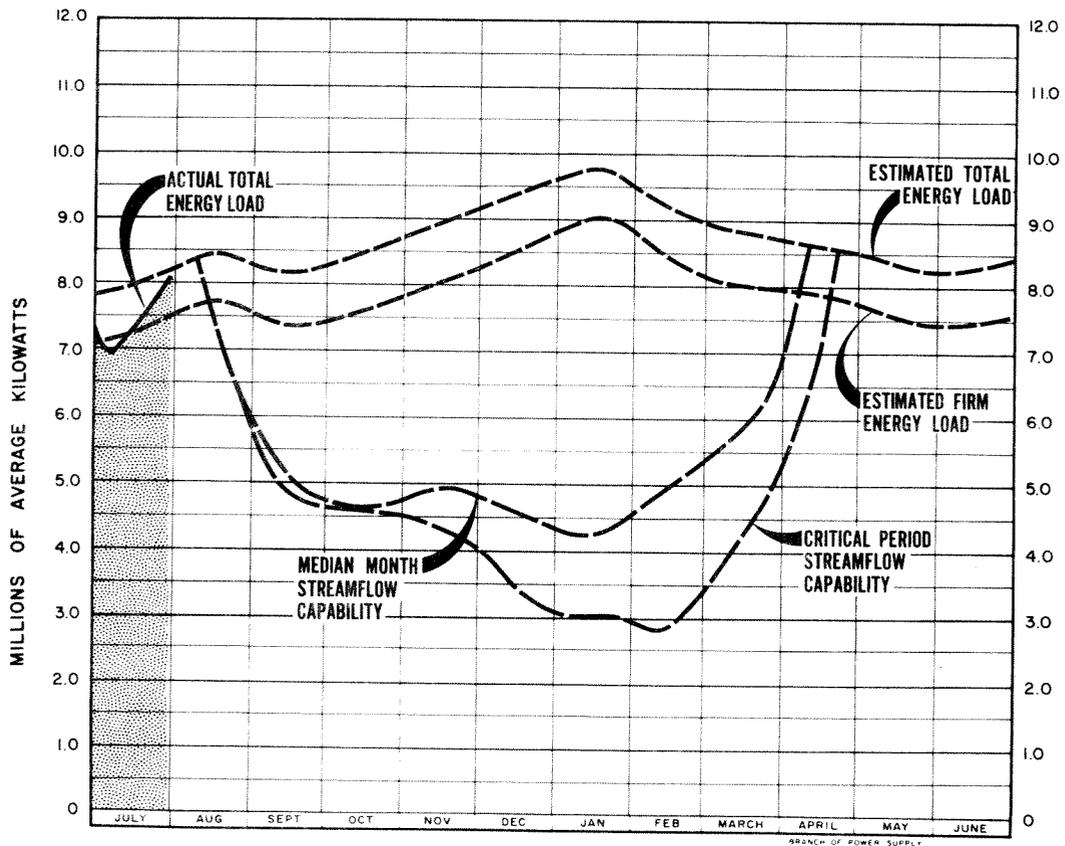
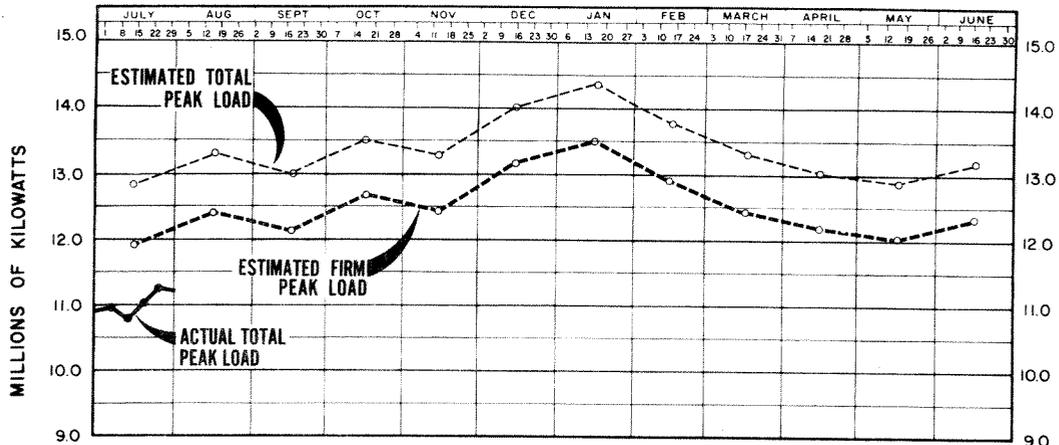
### Streamflows

Temperatures in July averaged near normal over the Columbia Basin with heavier than normal precipitation. Comparisons of current discharges with critical year and median month are shown below.

STREAMFLOWS  
Average Natural Discharge  
In Cubic Feet Per Second

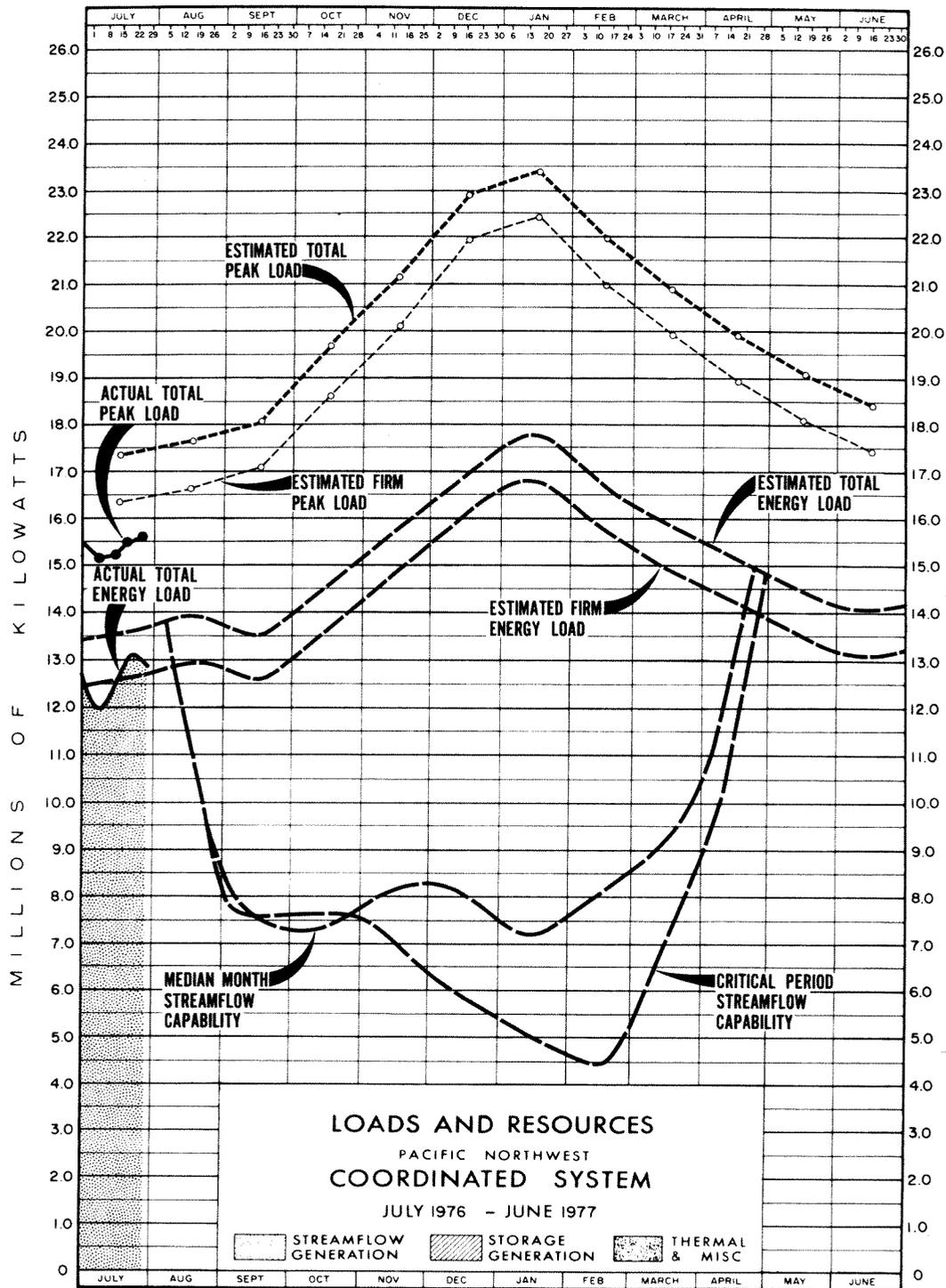
	July				
	<u>Actual</u> <u>1976</u>	<u>Critical</u> <u>Year</u>	<u>Median</u> <u>Month</u> <u>Year</u>	<u>Actual As</u> <u>Percent of</u> <u>Critical</u>	<u>Actual As</u> <u>Percent of</u> <u>Median</u>
Grand Coulee	267,200	225,400	181,200	118.5	147.5
Bonneville	350,800	285,400	256,200	122.9	136.9

BPA-Branch of Power Supply  
August 12, 1976



**LOADS AND RESOURCES  
BONNEVILLE POWER ADMINISTRATION  
JULY 1976      JUNE 1977**

STREAMFLOW GENERATION   
  STORAGE GENERATION   
  THERMAL & MISC



BONNEVILLE POWER ADMINISTRATION  
 Power Situation Statement  
 Monthly Summary  
 June 1976

JUL 26 1976

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 Code

Power Supply

A high residual snowpack remains in the Canadian portion of the Columbia Basin because of the cool weather in June. Reservoirs are near full contents and expected to fill by the end of July. With normal temperatures the runoff from Canada should average above normal for the remainder of the season. These favorable conditions indicate a high probability that all surplus energy markets will be served through the month of July. *PO 2-2-13*

Generation and Load

Federal load for June was 6.8 percent and 9.2 percent below the peak and energy estimates, respectively.

During June the Federal System and Pacific Northwest utilities delivered a total of 2,519,640 megawatthours of surplus energy to the Southwest. BPA delivered 1,874,739 megawatthours of the total surplus energy. Firm sales to the Southwest totalled 366,839 megawatthours. During June the Intertie was loaded to 99.9 percent of its available capacity. Comparing this month's deliveries with those of last June, total deliveries were up 12 percent and surplus deliveries 8 percent. AC deliveries increased 22 percent while the DC showed a 2 percent decline. Net energy deliveries to the Southwest over the Intertie since initially placed in service reached a total of 100 billion kilowatthours July 3, 1976.

The Pacific Northwest Coordinated System total load was 7.4 percent below the peak estimate and 3.9 percent below the energy estimate for the month. Loads and resources for BPA and the Coordinated System are shown on the attached charts.

	June 1976*		Jul 75 - Jun 76	
	Megawatts	As Percent of Last Month	Megawatts	As Percent Same Period Last Year
<u>Federal Load</u>				
Peak	12111	101.7	12689	102.4
Energy	7665	100.5	8274	96.3
<u>BPA Nonfirm Industrial Load</u>				
Energy	728	111.7	517	84.5
<u>Coordinated System Load</u>				
Peak	16282	98.4	20334	106.2
Energy	13167	100.5	13665	104.7

\*Coordinated System energy data are for the four weeks ending July 1, 1976.

### System Operations

Reservoir elevations as of June 30, 1976, compared with rule curves and full elevations are shown in the table below:

	<u>Elevations in Feet Above Mean Sea Level</u>		
	<u>June 30, 1976</u>		
	<u>Actual</u>	<u>Rule Curve</u>	<u>Full</u>
Libby	2442.00	2438.8	2459.0
Hungry Horse	3557.62	3556.3	3560.0
Albeni Falls	2062.30	2062.5	2062.5
Grand Coulee	1287.80	1270.0	1290.0
Dworshak	1599.65	1600.0	1600.0
John Day	264.40	262.0	268.0
Hills Creek	1541.15	1541.0	1541.0
Cougar	1689.92	1690.0	1690.0
Green Peter	1009.45	1010.0	1010.0
Foster	637.03	637.0	637.0
Detroit	1567.30	1563.5	1563.5
<b>CANADIAN STORAGE RESERVOIRS</b>			
Mica	2449.18	2375.8	2475.0
Arrow	1433.00	1430.0	1444.0
Duncan	1871.79	1861.9	1892.0

At month's end about 3 million acre-feet of reservoir storage remained to be filled. Most of this space was in the Arrow Lakes Reservoir; however, sufficient water was stored in Mica Project, above the treaty storage, to insure refill of Arrow.

June 1 forecasts of volume inflow enabled lowering of the June 30 rule curve elevations making additional storage draft available with a 95% probability of reservoir refill by July 31. The June 30 base and variable rule curves developed from the June 1 volume inflow forecasts are shown below:

	<u>Feet Mean Sea Level</u>		
	<u>Base Rule Curve</u>	<u>Variable Rule</u>	
		<u>Curve</u>	<u>Difference</u>
Mica	2388.1	2375.8	- 12.3
Arrow	1434.9	1430.0	- 4.9
Duncan	1872.0	1861.9	- 10.1
Libby	2449.7	2438.8	- 10.9
Hungry Horse	3560.0	3556.3	- 3.7
Grand Coulee	1289.9	1270.0	- 19.9
Dworshak	1600.0	1600.0	0

Seasonal maintenance of generating units at major projects was possible with sufficient power capability to serve all available markets.

The Hanford Thermal Plant remained off the line for the entire month. Trojan was shutdown for seasonal maintenance during the month and is expected to return to service sometime in August. Unit #2 at Centralia continued out of service for maintenance. Generation from Unit #1 totalled 269,205 megawatt-hours for the month.

### Streamflows

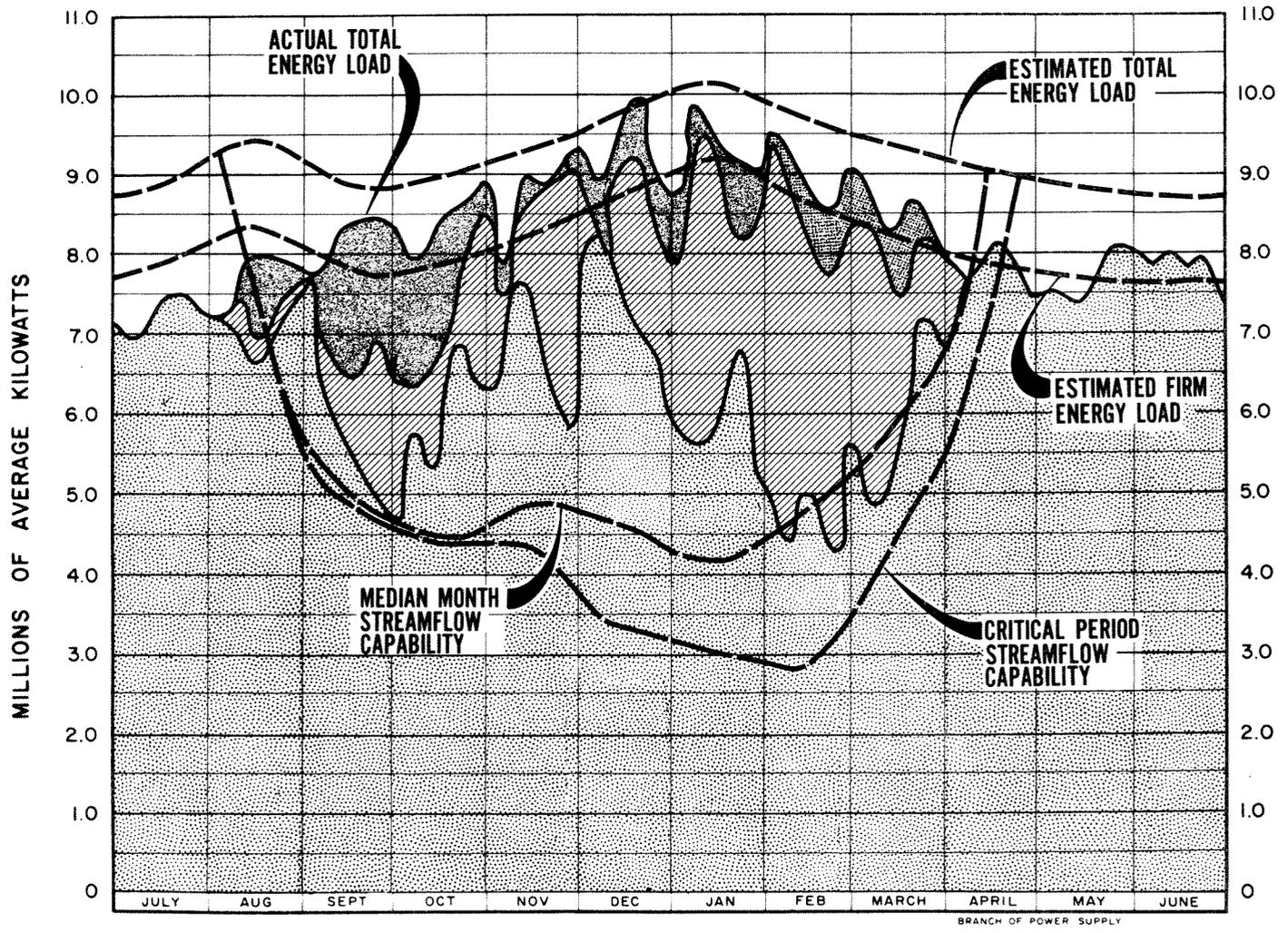
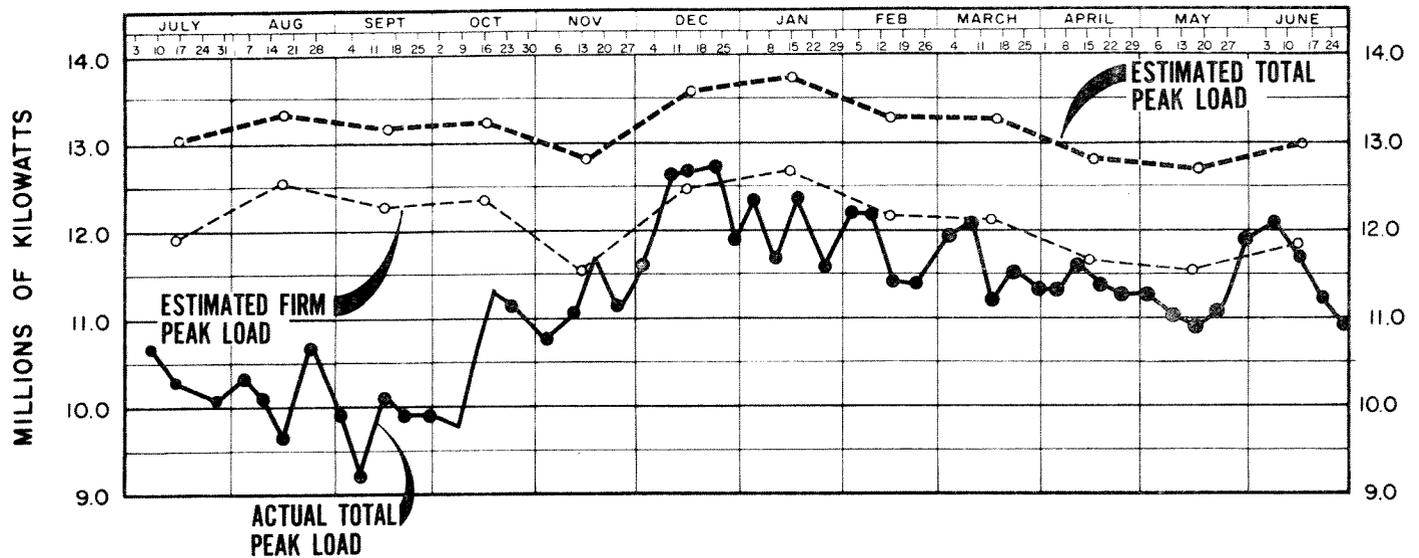
Temperatures for June were colder than normal over the bulk of the Columbia Basin, the only exception being the Upper Snake River Basin which had temperatures close to seasonal normals.

Precipitation during the month was less than normal over the Columbia Basin except for an area across southeast British Columbia and northwest Montana where precipitation ranged up to 175 percent of normal. Comparisons of current discharges with critical year and median month are shown below:

**STREAMFLOWS**  
Average Natural Discharge  
In Cubic Feet Per Second

	June			July 1975 - June 1976				
	Actual Year	Critical Year	Median Month	Actual As Percent of Critical	Actual As Percent of Median	Actual Average	Actual As Percent of Critical	Actual As Percent of Median
Grand Coulee	287,500	271,600	285,200	105.9	100.8	129,900	145.5	127.4
Bonneville	451,500	392,100	433,200	115.1	104.2	230,300	159.8	132.1

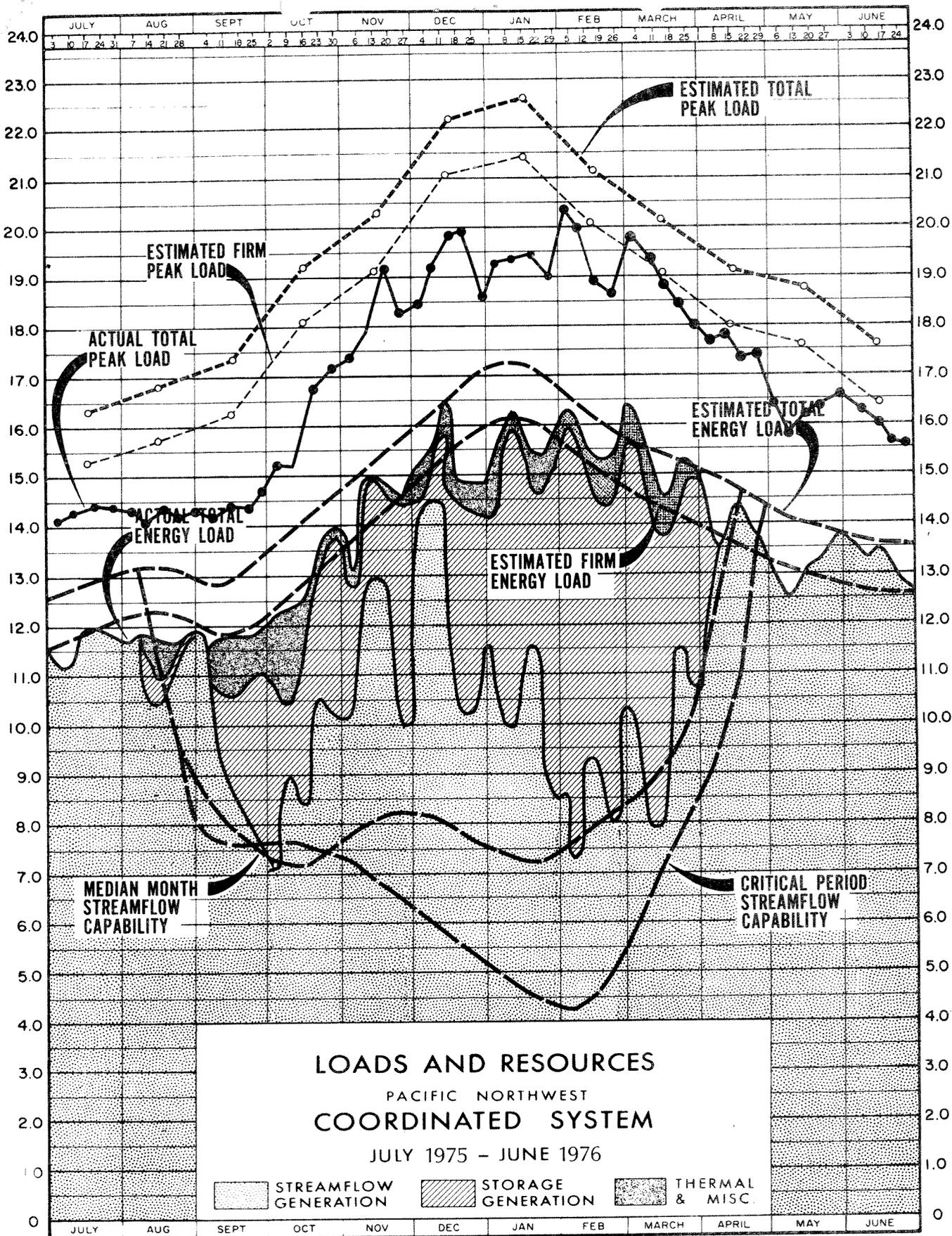
EPA-Branch of Power Supply  
July 15, 1976



**LOADS AND RESOURCES**  
**BONNEVILLE POWER ADMINISTRATION**  
 JULY 1975 - JUNE 1976

STREAMFLOW GENERATION
  STORAGE GENERATION
  THERMAL & MISC

MILLIONS OF KILOWATTS



WALLA WALLA AREA DISTRIBUTION OF MONTH-END REPORT

MAY 26 1976

C. R. Foleen - A  
Harold Kropitzer - AD  
W. H. Clagett - AC

Assistant Administrator for Operation & Maintenance - O

Assistant to O&M Manager - O  
Assistant to O&M Manager (Computer) - O  
Assistant to O&M Manager (Conservation) - O  
Chief, Branch of Maintenance - OH  
Chief, Branch of System Operations - OG  
Area Managers - OP OS OK  
District Managers - OPG OKN OKK OWI

Assistant Administrator for Engineering & Construction - E/EB

Assistant to Chief Engineer (Computer Applications) - EC/EA

Engineering Manager - EH/EI

Chief, Branch of Plant Services - EJ  
Chief, Branch of Construction - EK  
Chief, Branch of Land - EL  
Chief, Branch of Materials & Procurement - EM  
Chief, Branch of System Engineering - EO  
Chief, Branch of Control Engineering - EP  
Chief, Branch of Substation Design - ES  
Chief, Branch of Transmission Design - ET  
Head, System Planning Section - EOF  
Head, Design Services Section - ES-4  
Head, Substation Construction Section - EKS  
Head, Test & Energization Section - EKSE

Assistant Administrator for Management Services - S

Assistant Administrative Manager - S-2  
Assistant to Administrative Manager (Computer Application) - S  
Chief, Branch of Computer Applications - SW  
Head, System Programming Section - SWS  
Budget Officer - SL

Assistant Administrator for Power Management - P

Assistant to Power Manager (Computer Applications) - PB  
Chief, Branch of Customer Services - PC (2)  
Chief, Branch of Power Resources - PR  
Head, Requirements Section - PRR  
Chief, Branch of Power Supply - PS

Regional Solicitor - XORS

May 25, 1976

WALLA WALLA AREA ACTIVITIES REPORT  
MONTH OF MAY 1976

GENERAL

Vandalism - During the month, gunshot insulator units were replaced on the following lines: McNary-Franklin No. 2 line - 47 units; McNary-Richland line - 9 units; Big Eddy-DeMoss line - 3 units, Carson Tap line - 3 units; and the Big Eddy-Redmond line - 2 units. A gunshot airway light was replaced on the Boardman-Ione line.

## POWER MANAGEMENT

Benton County Public Utility District - We denied the customer's request for at-site power to serve an expansion of the Chevron agricultural manufacturing plant at Kennewick.

We notified the District by letter that energization of the Horse Heaven substation will be delayed from June 15, 1976 to September 1, 1976.

Benton Rural Electric Association - New pump additions in the Black Rock substation area will add approximately 800 kw to the peak load. It will be necessary to add transformer capacity prior to the summer of 1977. We plan to move the present North McNary transformers to Black Rock to replace the existing transformer.

A large unanticipated load consisting mainly of housing units will overload the Ledbeder substation during the winter of 1977-78. A 6 mva transformer will be paralleled with the existing bank to provide the needed additional capacity.

Central Electric Cooperative - We met with representatives of the Cooperative and their engineering consultant to discuss the possibility of the Cooperative establishing an emergency interconnection with Pacific Power & Light Company's system in the vicinity of the Pilot Butte substation. Pacific has been asked for their requirements.

City of Idaho Falls - BPA inspected the City's hydro plants on May 12. The City is assembling historical operating data for use in determining a mutually satisfactory assured energy capability.

The City has formally requested that its load estimate be jointly reviewed as actual loads have been exceeding those shown in the February 1973 forecast.

A power sales contract amendment has been requested to increase the "City's investment" in the electric system due to acquisition of Utah Power & Light Company facilities located in a residential subdivision which was annexed to the City last year. The Electric Division paid for approximately 43% of the purchase and the City's general fund financed the remainder.

Lost River Cooperative-Salmon River Cooperative Service - Utah Power & Light Company has written a letter stating that the Company desires to build both the 30 mile, 230 kv transmission line and the 230-69 kv Lost River substation. This is contrary to our previous understanding with Utah Power. The question has not yet been resolved. In order that the overall project schedule not be delayed, Utah Power is continuing survey work on the Antelope-Arco section and Lost River Cooperative on the Arco-Moore (Lost River) section.

Raft River Cooperative - Raft substation was energized at 1408 on May 13 and released to operations at 0900 on May 19. Initial load was 3720 kw.

Energy Research & Development Administration (ERDA) - On April 29, we met with staff members of ERDA and Atlantic Richfield Hanford Company (ARHCO) to discuss the present power supply situation, the availability of power to serve their needs and the construction of Bonneville facilities on the Hanford reservation. Tests related to energy conservation programs which will use large amounts of power are planned by ERDA.

ERDA indicated an interest in energy conservation meetings for their employees similar to those held for preference customer utility employees.

Corps of Engineers - Colonel Nelson Conover, District Engineer since 1973, has been reassigned effective May 31. He has been replaced by Colonel Christopher H. Allaire, whose last assignment was with the U. S. Armed Forces Command.

The Corps' proposed Lower Snake River Fish and Wildlife Compensation Plan has been released for a 90 day review by Federal Agencies.

Draft Idaho Water Plan - Our comments on the plan which envisions large scale irrigation development, requiring major amounts of power, were submitted to the Branch of Power Resources.

Resale Rates - Revised resale rates of Northern Wasco County People's Utility District were effective on April 17. The rates represented about a 12 percent increase.

Customer Service Policy - The Area Power Manager's proposed draft of a revised Customer Service Policy was submitted to the Deputy Administrator for approval.

Preference Customer Meetings - Arrangements have been made and all Area preference customers have been notified about two meetings to discuss their participation in WPPSS Projects 4 and 5. Idaho Falls District customers will meet at the Ramada Inn in Burley on May 25 and the other Walla Walla Area customers will meet at the Walla Walla Country Club in Walla Walla on May 26.

Contracts - Twenty-nine (of a total of 37) Area preference customers have executed the Proposed Amendatory Agreement to their power sales contracts revising allocation procedures.

Directory of Energy Publications - A bibliography of publications covering the multi-faceted aspects of the energy situation was mailed to all preference customers.

## AREA ENGINEERING

Celilo Converter Station - Proposed methods of collecting data for the preliminary valve hall heat recovery study together with estimated costs will be sent to the Chief Engineer's Office. We propose to manually monitor 12 data points. The station operators will take readings twice per shift, as permissible, between their other duties.

Christmas Valley Tap - Midstate Electric Cooperative has completed their plans for the tap which will be at structure 55/7 on the Redmond-Harney 115 kV line.

City of Richland - The City plans to issue the bids for the construction of Tapteal Substation within a few weeks.

M. A. Collins 115 kV Tap Line - Construction drawings for the tap line switch structure near Benton County PUD's Carma Substation have been sent to Klickitat PUD. Construction will be performed by Klickitat with Bonneville supplying material for the structure and the switch.

ERDA 351 Substation - ERDA's budget proposal for FY 1978 adds three 115 kV PCB's at the 351 Substation replacing the the present automatic disconnect switching scheme. Relaying and switching diagrams are being reviewed by Area and Central Office staff.

Haymill Service -A public meeting to discuss the E.I.S. location supplement for the customer service project was held in Burley on May 4, with a registered public attendance of 47 persons. Many statements and comments regarding specific location were received. No opposition to the overall project was expressed. The official transcript has been received and forwarded to the Environmental Manager.

Hood River Substation - Two preliminary prints of PP&L's second 115-69 kV transformer addition have been received. Due to expansion of the switchyard by 25-feet, we have asked the Branch of Land to cancel an occupancy permit made to Allen Hay Motor Company. Pacific would like to start grading and fencing the third week of June. A Trust Fund estimate and Agreement have been requested.

Scooteney Substation - We are changing to higher rating 34.5 kV CT's on the Big Bend Electric Cooperative feeder because Big Bend's present loads are exceeding the existing CT ratings.

Spearfish Substation - We are working with Klickitat County PUD on their plans to install their voltage regulator in the BPA Substation.

Redmond Substation - Deschutes County was notified that we could not release any land along the east side of Redmond Substation for a county road because of Oregon State noise regulations.

## SYSTEM OPERATION AND MAINTENANCE

Equipment Out of Service - At Bakeoven, Capacitor Group 1 is out of service for the installation of the prototype NGH control scheme. Assembly should be complete this fall and ready for system test.

Malin - Round Mountain No. 2 Channel A phase comparison relays cut out for the PGE dispatcher.

Celilo - Group 3, B-phase transformer V-146 is at General Electric's plant in Pittsfield, Massachusetts, for repair. Spare transformer V-158 is being used in this group.

Highlands Substation - Mobile spare transformer T-1483 is in service replacing T-1047 which is untanked at Ross. The permanent replacement bank T-1411 is at the station undergoing final checkout prior to energization.

John Day Substation - John Day-Grizzly No. 1 Line B-phase CPT is out-of-service. Relaying is presently temporarily wired up to Powerhouse No. 1 instrument potential with Set No. 1 relaying out-of-service.

Celilo - Intermittent microwave noise on the "K" microwave system has been interfering with the Celilo-Sylmar DC line control computer. The intermittent nature of this noise makes it difficult to locate; however, we are continuing our efforts to isolate and eliminate the source of the noise.

Removal of unused sheet metal ducts and louvers in the cooling towers at Celilo was begun by a local contractor.

On Tuesday, May 4, 1976, we met with Hughes and with representatives of Substation Design and System Engineering on the location of the Metallic Return Transfer Breaker, the controls and the auxiliary voltage necessary. It is apparent follow-up meetings will be necessary. The MRTB is to be operational in June 1977.

On April 25, 1976, at 1052 hours and on April 26, 1976, at 0053 hours, Pole 4 was lost due to DC differential operations at Sylmar. Since we were in automatic, the power loss was only 640 megawatts. The fast capacitor inserted and the investigation at Sylmar is continuing.

McNary Substation - On May 12, 1976, the old Santiam No. 1 230 kV Line was tapped to the Big Eddy-Redmond Line and energized from McNary. Boardman Substation and Dalreed Substation are both transferred to the McNary-Santiam No. 2 230 kV Line. The MWTT to Santiam and UHF transfer trip from Boardman are both in-service utilizing the Bus Section No. 1 bus tie breaker (A-412).

PCB A-412 that was damaged on April 21, 1976, in the steam cleaning accident, has been repaired and returned to service.

Targhee Substation - On May 5, 1976, at 1259 hours, the spare 6/8 MVA bank was energized in parallel with the existing 7.5 MVA bank. At 1320, load was picked up and the new equipment was turned over to Operations at 1500. The new 1200-5 metering CT's, bought by Fall River for BPA, were not installed at this time. They would not fit in the metal clad switchgear. Fall River has gone back to General Electric to resolve this. This summer's anticipated load will not overload the existing 600-5 CT's.

Raft Substation - The new station was energized on May 18 at 1408 hours. Load was picked up at 1314, and it was released to Operations at 0900 on May 19, 1976.

Grizzly Substation - On April 20, 1976, the 500 kV intertie generator dropping capacitor insertion scheme was modified. For the loss of one intertie line, generator dropping to Chief Joseph is now initiated. Previously, insertion of the high-speed caps at Bakeoven and Fort Rock was initiated for the loss of one line.

### ADMINISTRATIVE

Employment - Employment levels as of May 21, 1976, are 266 permanent, 21 temporary and 7 exempt. We anticipate our June 30 permanent employment level to be 270 against a ceiling of 275.

Retirements - Two disability retirements were approved during May. William W. White, Senior Substation Operator at Hanford retired on May 21, and Dwight L. Haight, Lineman at Big Eddy retired on May 13. Three additional disability retirement applications are pending approval by the Civil Service Commission.

### PUBLIC RELATIONS

Films - On May 12, "Great River", and "World Behind Your Light Switch" were shown to the Pelican Elementary 5th grade Social Studies students, Klamath Falls, Oregon.

Meetings - May 6-7 Area Economist attended the PNW Regional Economic Conference at Victoria, B.C.

May 15 I attended the Harney Electric Cooperative annual meeting at Crane, Oregon.

May 19 Area Engineer spoke at a meeting of Mid-Columbia Economic Development District on the subject of the D-C Intertie.

May 24 Area Power Manager spoke to the Milton-Freewater Chamber of Commerce on the Regional Power Supply Situation.

LABORATORY REPORT

BRANCH OF LABORATORIES

*ERJ*  
PO 2-2-13

TITLE:  Prototype 1100 kV Test Facilities Progress Report No. 20	Date:	Report No.:
	5-18-76	ERJ-76-94
	Author:	<i>SAA</i>
	Stig A. Annestrand	
	Assisted By:	
	1100 kV Project Coordinators	
	Approved By:	
ERJ	Stig A. Annestrand <i>SAA</i>	
L. R. No.:	W. O. No.:	
No. of Pages:	Typed By:	
18	S. Burnett	

SUMMARY:

Recent activities in regard to BPA's prototype 1100 kV transmission line project are discussed in this report. Construction work at both Moro and Lyons is progressing satisfactorily. All tower footings for the Moro test line have been completed. The first assembled 1100 kV transformer unit failed during the low frequency induced test at the factory. The cause is being investigated.

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D. Hartmann - EOB	L. Greco - EPGB	Official File - ERA

The following is a brief summary of progress made on the 1100 kV Project since the March 25, 1976, Design Review Meeting.

1. Moro Mechanical Test Facilities - Design

Construction specifications and available preliminary drawings for the test site were transmitted to the Branch of Construction on May 12. A meeting between all interested parties to discuss the specifications will be scheduled for the week of June 7.

Requirements for grounding of the line and instrumentation and the associated circuitry are currently being assembled for incorporation into a design document.

H. J. Atkins has been assigned to coordinate on-site Transmission Design activities during construction of the Moro Test site and provide liaison between force account construction and design personnel.

2. Moro Mechanical Test Facilities - Construction

All six tower footings for the test line have been completed. The tower steel has been delivered to the site and four of the six towers have been assembled. One tower has been erected.

3. Lyons UHV Test Facilities - Test Area Design

Water to the trailer site will be provided by the Lyons-Mehama Water District. This service will insure an adequate reliable source of potable water. The quality and quantity of water available from a well could not be ascertained from test holes at the site.

Drawings detailing the site layout and wiring are complete.

The electrostatic testing area has been moved to the east of midspan of the test span to accommodate a larger pasture for the biological studies contractor. A test installation of a porous fabric mat - Mirafi 140 - will be made on portions of the access road and parking area.

4. Lyons UHV Test Facilities - Land Acquisition

The location for the Lyons remote RI-TVI monitoring site has been acquired on a lease basis. The terms of the lease are yearly payments of \$150 per year for 5 years with provisions for a 5-year extension at the same annual rate.

5. Lyons UHV Test Facilities - Construction

Clearing is completed and the conductors of the 230 kV line as well as the 230 kV towers have been removed. Anchors have been completed for the guyed tower 1/1 and are 30 percent complete for tower 2/2. One footing for a self-supporting tower has been completed and steel for one self-supporting tower has been delivered. All tubular steel poles have been delivered.

6. Material Procurement

W.O. 842-501: Lyons UHV Transformer Site  
Construct

6.1 Power Transformer, 50 MVA  
Westinghouse Electric Corporation  
C 5001N: Items 3, 7  
CDD 09/24/76  
Narrative:

\$1,137,445

a. (1) <u>Transformer:</u>	<u>2nd Unit</u>	<u>3rd Unit</u>	<u>1st Unit</u>
Coils Completed	05/05/76	05/11/76	*
Core & Coil Testing	05/17/76	05/26/76	*
Testing Completion	07/01/76	07/14/76	*
Ship	07/14/76	07/26/76	*

\*No estimate of schedule. 1st unit failed 180 Hz induced test on 04/21/76.

Contractor attributes failure to accidental overvoltage during switching Surge Test (which, however, 1st unit passed).

Contractor plans no transformer design changes.  
1st unit disassembly/examination in process.  
Removal of tank top from base, uncovering coils, to be finished by 05/14/76.  
Teardown of coils and examination to be completed by 05/17/76.

(2) Shipment to be by rail to West Scio, OR; then by truck to Lyons Substation. Highway officials restrict trucking of heavy loads such as ours to the months of July and August -- and even this is subject to satisfactory condition of both the subgrade and the surface of the highway.

b. Bushing, 230 kV/750 kV BIL/5500 A:  
All tests completed.

c. Bushing, 1100 kV/2175 kV BIL/300 A:  
(1) The lower porcelain of the bushing in the 1st unit was damaged during the 04/21/76 Induced Test failure. Westinghouse will replace porcelain and retest bushing. Our QCR M. T. Reynolds estimates this will be completed by late May.

(2) Testing:  
(a) Insulation testing completed in March. OK  
(b) Cantilever test to be made in late May 1976  
(c) Thermal test to be in June 1976 with oil to flange, simulating conservator application.

d. Mod. C: One Spare Bushing, 230 kV/750 kV BIL/5500 A  
Item 3A \$9,500  
CDD 09/24/76

- e. Mod. D: Delete Automatic Transfer Switches  
Item n/a Price Reduction (\$7,500)

6.2 Surge Arresters

- a. 168 kV Surge Arresters  
General Electric Company  
C5195NB: Item 1 \$8,826  
CDD 07/01/76

Narrative: Latest report gives shipping date of 06/01/76

- b. 768 kV Surge Arresters  
Ohio Brass Company  
C 5195NA: Item 2 \$102,724  
CDD 07/01/76

Narrative: All arrester gaps must be replace, because capacitors (from outside supplier) were defective.

Replacement, in one arrester, to be completed in late May.

Sparkover and corona testing, of the arrester to be completed in early June, and if tests on the one arrester are OK, Ohio Brass will then complete the others.

Shipment expected to be late July, for arrival early Aug 1976.

6.3 230 kV Load Interrupters

- S&C Electric Company  
C 5242A: Item 2 \$53,150  
CDD 03/31/76

Narrative:

- a. Reported shipped 04/19/76.

- b. Mod B: Substitutes 66  $\Omega$  resistors for 125-200  $\Omega$ , with  
Price Reduction (\$700)

- c. Mod. C: Deletes 8 cycle interrupting time, and changes motor  
operating voltage to 48 V d.c., with  
Price Reduction (\$1,865)

6.4 Transformer, Station Service, 50 kVA

- Westinghouse Electric Supply Company  
PO 61063: Item 1 (3 units) \$1,725  
CDD: 03/17/76

Narrative: Completed. Third unit, which contractor had to repair, was received on 04/28/76.

6.5 Construction of Substation Facilities

- John M. King Co.  
C 6251N: Items 35 through 56 \$99,279  
Schedule II, Group E  
CDD 08/06/76

Narrative: Awarded 03/26/76

Construction to report on this henceforth.

- 6.6 Copper Cable and Conductor  
 General Electric Supply Co.  
 PO 63377: Items 1, 2 \$1,677  
 CDD 03/26/76  
 Narrative:
- a. Freight to be added to the \$1,677
  - b. Item 2 received 03/12/76
  - c. Item 1 still due; ship schedule is 05/13/76
- 6.7 Relay  
 Tekelectric Supply Co.  
 PO 63791: Item 3 \$71  
 CDD 04/15/76  
 Narrative: Reported shipped 04/23/76
- 6.8 Pushbuttons, Indicating Lights, Legend Plates  
 Amfak Electric Supply Co.  
 PO 63961: Items 2 through 8 \$116  
 CDD 04/01/76  
 Narrative: Items 2 through 5 received 04/06/76  
                   6          8          04/16/76
- 6.9 Relay, Auxiliary  
 Westinghouse Electric Corp.  
 PO 63984: Item 2 \$128  
 CDD 07/31/76  
 Narrative: Received 04/08/76
- 6.10 Relay, Target  
 Westinghouse Electric Corp.  
 PO 63984: Item 1 \$648  
 CDD 07/31/76  
 Narrative:
- (1) Scheduled to ship 06/24/76
  - (2) To be in accordance with Supplemental PR 76EMMV0173 dated 04/06/76 (i.e. 0.2 A coils)
- 6.11 400 A Distribution Panelboard  
 General Electric Supply Co.  
 PO 64432: Items 10, 14 \$439  
 Narrative: Being expedited.
- 6.12 Blower, 80 CFM  
 W. W. Grainger  
 Cash PO 1024: Item 1 \$13  
 Narrative: Wanted 07/01/76. Received 04/22/76
- 6.13 Relay Mounting Hardware  
 Platt Electric Supply, Inc.  
 PO 64574: Items 1, 2, 3 \$408  
 CDD 05/16/76  
 Narrative: Issued 04/16/76

6.14 Relay Mounting Hardware  
Amfak Electric Supply Co.  
PO 64598: Item 1 \$155  
CDD 04/28/76  
Narrative: Issued 04/22/76

6.15 Strip Heater and Thermostat  
PR 76EMV0228  
Wanted 06/01/76

6.16 Battery Charger  
PR 76ESJ0114  
Wanted 07/15/76

W.O. 842-503: Lyons UHV Test Line No. 1  
Construct

6.17 Tower Steel

a. Guyed Tubular-Structures

Meyer Industries  
C 5107NB: Schedule I \$90,514  
Mod. B: Design Changes - Price Increase \$28,769  
Mod. C: Design Changes - Price Increase to  
New Total Price \$122,928  
Mod. D: Design Changes - Price Increase to  
New Total Price \$123,828

CDD 04/01/76  
Narrative: Received all 04/30/76

b. Lattice Structures

Nichimen Co.  
C 5107NA: Schedule II \$493,794  
CDD 03/17/76  
Narrative: Received all 03/27/76

6.18 Accessories for Chukar Conductor

Alcoa Conductor Products  
C 5099NC: Items 29, 31, 33 \$6,908  
CDD 05/19/76  
Narrative: Item 29 received 04/06/76  
Items 31, 33 received 04/12/76

6.19 Conductor Hardware (Ball Eyes, Shackles)

Columbia Forge and Machine  
C 5374C: Items 27, 29 \$8,335  
CDD 02/17/76  
Narrative: Received all 04/02/76

6.20 Long Rod Plastic Insulators

Ohio Brass Co.  
C 5428N: Item 1 \$31,568  
CDD 10/01/75  
Narrative: We do not need this material until 06/01/76 or later.  
Ohio Brass shipped all on 04/27/76

- 6.21 Spacer Damper  
 Alcoa Conductor Products  
 C 6143N: Item 1 (flexible) \$20,728  
 CDD 06/01/76  
 Narrative: Scheduled to ship in June for arrival at destination by 07/01/76. Construction Contract 6251N gives 07/01/76 availability date.
- 6.22 Conductor, Aluminum Clad Steel  
 Kanematsu-Gosho (USA) Inc.  
 C6193A: Item 1 \$11,865  
 CDD 03/15/76  
 Narrative: Received all 04/02/76
- 6.23 Turnbuckles and Chain Shackles  
 Columbia Forge and Machine  
 C6176A: Items 1, 2, 10, 11 \$18,411  
 CDD 03/01/76  
 Narrative: Items 1, 2 received on 04/06/76  
                   10                                   04/02/76  
                   11 (50 pcs) 49 on 04/12/76  
                           1 to ship W/O 05/10/76
- 6.24 Transmission Line Reflective Signs  
 Federal Prison Industries, Inc.  
 PO 62349: Items 1 through 6 \$210  
 CDD 03/06/76  
 Narrative: Received all 04/01/76
- 6.25 Construction of Test Line  
 John M. King Co.  
 C 6251N: Items 1 through 11, 14 through 30 \$605,740  
 CDD 10/01/76  
 Narrative: Awarded 03/26/76  
 Construction to report on this henceforth.
- 6.26 Long Rod Plastic Insulators  
 Ceraver (Paris, France) through Sediver, NJ USA  
 C 6357N: Items 1 through 4 \$23,640  
 CDD W/O 05/10/76, W/O 06/14/76, W/O 07/05/76  
 Narrative: 1st shipment received W/O 05/10/76, via air, but dimensions/shape of pieces not what BPA expected.  
 We are discussing this matter with Sediver.
- W.O. 842-504: Moro UHV Mechanical Test Line No. 1  
 Construct
- 6.27 Accessories for Chukar Conductor and Thrasher Conductor  
 Alcoa Conductor Products  
 C 5099NC: Items 30, 32 (Chukar) \$2,801  
                   34 through 37 (Thrasher)  
 CDD 05/19/76  
 Narrative: Items 30, 32 are for 1100 kV Project. Received 04/12/76. Items 34 through 37 are not needed for 1100 kV Project. They will be accepted when delivered, however, and put in storage. Their cost: \$1,549.

- 6.28 Conductor Hardware (Ball Eyes, Shackles)  
 Columbia Forge and Machine  
 C 5374C: Items 28, 30 \$1,694  
 CDD 02/17/76  
 Narrative: Received all 04/02/76
- 6.29 Long Rod Plastic Insulators  
 Ohio Brass Co.  
 C 5428N: Item 1 \$19,730  
 CDD 10/01/75  
 Narrative: We do not need this material until 06/01/76 or later.  
 Ohio Brass shipped all on 04/27/76.
- 6.30 Spacer-Damper  
 Alcoa Conductor Products  
 C 6143N: Item 2 (flexible), 3 (rigid) \$12,197  
 CDD 06/01/76  
 Narrative: Scheduled to ship Item 3 in May for arrival at destination  
 by 06/01/76. Air freight may be needed to make the 06/01/76 date.  
 Scheduled to ship Item 2 in June for arrival at destination by 07/01/76.  
 Construction Contract 6251N gives 07/01/76 Availability Date for Item 2.
- 6.31 Transmission Line Reflective Signs  
 Federal Prison Industries, Inc.  
 PO 62349: Item 7 \$62  
 CDD 03/05/76  
 Narrative: Received all 04/01/76
- 6.32 Walkways, Ladders, and Cages  
 PR 75ETFO005  
 Narrative: Request for quote from Nichimen Co. Inc.  
 Material to be obtained via Mod to existing C 5107NA  
 W.O. 842-506: Moro UHV Mechanical Test Line No. 1  
System Control Facilities
- 6.33 Microwave Equipment  
 GTE Lenkurt  
 PO 62980: Items 1, 2, 4, 10 through 14 \$1,163  
 CDD 07/01/76  
 Narrative: Reported on schedule
- 6.34 Data Acquisition/Distribution System  
 Datel Systems, Inc.  
 PO 62983: Items 1, 1A through 1F \$8,216  
 CDD 03/15/76  
 Narrative: Received all 04/22/76
- 6.35 SICS Equipment  
 Digital Equipment Corporation  
 PO 62985: Items 1 through 11 \$19,443  
 CDD 04/15/76  
 Narrative: Item 5 received 02/25/76  
 8 01/21/76  
 Balance being expedited.

6.36 Batteries and Accessories  
C&D Batteries  
PO 62997: Items 1, 1A, 2 through 7 (parts of) \$147  
CDD 03/01/76  
Narrative: Received all 04/05/76

6.37 Power Supply  
Abbot Transistor Labs, Inc.  
PO 63233: Item 1 \$143  
CDD 04/15/76  
Narrative: Received 04/27/76

6.38 Power Supply  
Electrostatics, Inc.  
PO 63384: Item 1 \$609  
CDD 03/29/76  
Narrative: Received 03/30/76

6.39 Universal Active Filter  
Burr-Brown, c/o Hayes Technical  
PO 63722: Item 1 (part of) \$117  
CDD 03/12/76  
Narrative: Received all 03/24/76

6.40 Antenna  
Phelps Dodge Communications Co.  
PO 63385: Item 1. Price increase of \$83 to new price of \$111  
CDD 04/09/76  
Narrative: Received all 04/09/76

6.41 Cable Assembly  
Interface Electronics  
PO 63371: Item 1 \$147  
CDD 03/05/76  
Narrative: Received all 03/30/76

6.42 Core Memory  
Digital Equipment Co. \$4,000  
PO 63648: Item 1A  
CDD 03/31/76  
Narrative: Received all 03/25/76

6.43 Layout and Wiring Services  
Custom System Services  
PO 63744 \$267  
Narrative: Received all 03/11/76

6.44 Signal Conversion and Transmission Equipment  
Wescom, Inc.  
PO 64294: Items. 1 through 8 \$713  
CDD 05/28/76  
Narrative: Issued 04/01/76

- 6.45 Bit Switches  
 Marshall Industries  
 PO 64830: Item 1 \$683  
 CDD 06/04/76  
 Narrative: Issued 05/06/76
- 6.46 Lightning & Surge Protector  
 PR 76EFGBO770  
 Wanted 06/01/76  
 Narrative: In process
- W.O. 842-507: Wasco Radio Station, Moro Mechanical  
Test Line - System Control Facilities
- 6.47 Microwave Equipment  
 GTE Lenkurt  
 PO 62980: Items 1, 3, 5, 10, 11, 15, 16 \$1,204  
 CDD 07/01/76  
 Narrative: Reported on schedule.
- 6.48 Microwave Equipment  
 GTE Lenkurt  
 PO 62973: Items 11, 12, 13, part of Items 9, 10, 16, 17 \$1,210  
 CDD 07/01/76  
 Narrative: Reported on schedule
- 6.49 Batteries and Accessories  
 C&D Batteries  
 PO 62997: Items 1, 1A, 2 through 7 (parts of) \$147  
 CDD 03/01/76  
 Narrative: Received all 04/05/76
- 6.50 Antenna  
 Phelps Dodge Communications Co.  
 PO 63385: Item 1. Price increase of \$83 to new price of \$111  
 CDD 04/09/76  
 Narrative: Received all 04/09/76
- W.O. 842-508: Santiam Substation, Lyons UHV  
Transformer Site - System Control  
 Facilities
- 6.51 Multiplex Channel Equipment for Wide Band Radio Link  
 GTE Lenkurt  
 PO 61600: Item 17 \$221  
 CDD 04/30/76  
 Narrative: Report on schedule.
- 6.52 Telemetry Equipment  
 RFL Industries  
 PO 61958: Item 7 \$958  
 CDD 02/15/76  
 Narrative: Scheduled to ship 04/16/76. Being expedited.

- 6.53 Isolation Transformer  
 Western Electric Co., Inc.  
 PO 64001: Item 1 (part of) \$432  
 CDD 06/17/76  
 Narrative: Received all 04/20/76
- W.O. 842-599: Lyons UHV Transformer Site -  
 System Control Facilities
- 6.54 Multiplex Channel Equipment for Wide Band Radio Link  
 GTE Lenkurt  
 PO 61600: Items 1 through 14 \$3,328  
 CDD 04/30/76  
 Narrative: Received Items 8 through 14 02/27/76  
 Items 1 through 7 being expedited.
- 6.55 Telemetry Equipment  
 RFL Industries  
 PO 61958: Items 1 through 6 \$13,499  
 CDD 02/15/76  
 Narrative: Scheduled to ship 04/16/76. Being expedited.
- 6.56 SICS Equipment  
 Digital Equipment Corporation  
 PO 62979: Items 1 through 6 \$6,295  
 CDD 03/15/76  
 Narrative: Items 4, 5 received 02/25/76  
 Balance being expedited. Letter to vendor 05/03/76
- 6.57 Isolation Transformer  
 Western Electric Co., Inc.  
 PO 64001: Item 1(part of) \$432  
 CDD 06/17/76  
 Narrative: Received all 04/20/76
- W.O. 842-510: Dittmer BPA System Control Center  
 Prototype 1100 kV Test Facilities -  
 New Equipment Installation
- 6.58 Multiplex Channel Equipment for Wide Band Radio Link  
 GTE Lenkurt  
 PO 61600: Items 15, 16 \$392  
 CDD 04/30/76  
 Narrative: Received all 03/15/76
- 6.59 Microwave Equipment  
 GTE Lenkurt  
 PO 62973: Parts of Items 9, 10, 14, 16, 17, 18 \$937  
 CDD 07/01/76  
 Narrative: Report on schedule.

- 6.60 Signal Conversion and Transmission Equipment  
 GTE Lenkurt  
 PO 64341: Items 1, 2 \$560  
 CDD 08/27/76  
 Narrative: Freight to be added to price.
- W.O. 842-511: Portland Interior Building, Prototype  
 1100 kV Test Facilities - System  
 Control Facilities
- 
- 6.61 SICS Central Processor  
 Digital Equipment Corp.  
 PO 54905: Items 1 through 20 \$46,115  
 CDD 07/15/75 for Items 1 through 15  
 01/30/76 16 20  
 Narrative: Item 17 being expedited. All other items have been received.
- 6.62 Core Memory  
 Digital Equipment Co.  
 PO 63648: Item 1 \$4,000  
 Narrative: Received 03/25/76
- 6.63 Channel Units  
 GTE Lenkurt "Proprietary Purchase"  
 PO 64420: Items 1, 4 \$442  
 CDD 09/01/76  
 Narrative: Issued 04/02/76
- W.O. 842-513: Lyons UHV Electrical Test Area  
 Construct
- 
- 6.64 Corona Loss Analyzer  
 SED Systems, Ltd.  
 PO 63373: Item 1 \$7,350  
 CDD 07/30/76  
 Narrative: Scheduled to ship 07/30/76
- 6.65 Filters and Instrument Amplifiers  
 Burr-Brown c/o Hayes Technical  
 PO 63237: Items 1, 2 \$556  
 CDD 02/27/76  
 Narrative: Item 1 received 03/15/76  
 2 received partial on 04/27/76. Balance being expedited.
- 6.66 Industrial Type Trailer  
 Cost Leasing Co.  
 C 6312N: Item 1 \$18,600  
 CDD 06/07/76  
 Narrative: Negotiated. Awarded 04/28/76. Contractor reported on 05/04/76 that he expects to meet CDD. Preliminary delivery by CDD is to Ross, for installation of BPA-furnished equipment. Final delivery within 14 days after receipt, is to site.

- 6.67 Lightning Warning System (Recondition and Modify)  
 B. K. Sweeney Manufacturing Co.  
 PO 62667: Item 1 \$450  
 CDD 02/29/76  
 Narrative: Reported shipped 04/26/76
- 6.68 Power Supply  
 Power/Mate Corporation  
 PO 63693: Items 1, 2, 3 \$202  
 CDD 02/23/76  
 Narrative: Items 2, 3 received 02/27/76  
                   1                  04/01/76
- 6.69 Atmospheric Instruments  
 MEE Industries  
 C 6300N: Item 2 (part of) \$9,975  
 CDD 07/27/76  
 Narrative: MEE expects to meet CDD
- 6.70 Wind Speed Instruments  
 Climatronics Corp.  
 PO 63737: Items 1 through 7 \$3,792  
 CDD 04/16/76  
 Narrative: Expected to ship 04/30/76
- 6.71 Audio Noise Instruments  
 General Radio  
 PO 63646: Items 1 through 14 \$24,948  
 CDD 04/30/76  
 Narrative: Received Items 3, 4 03/24/76  
                   Balance being expedited.
- 6.72 Signal Splitter  
 Mini-Circuits Laboratory  
 PO 64105: Items 1, 2 \$252  
 CDD 07/01/76  
 Narrative: Received all 04/13/76
- 6.73 Instrument Shelter  
 Weather Measure Corp.  
 PO 63738: Item 1 \$1,700  
 CDD 04/16/76  
 Narrative: Being expedited.
- 6.74 Extruded Teflon Tubing  
 Portland Valve and Fitting Co.  
 PO 63763: Item 1 \$324  
 CDD 04/05/76  
 Narrative: Received all 03/04/76



- 6.84 Multimeter  
 Hayes Technical  
 PO 64286: Items 1, 1A \$359  
 CDD 06/01/76  
 Narrative: Issued 03/30/76
- 6.85 Oscilloscope and Accessories  
 Tektronix  
 PO 64290: Items 1 through 6 \$3,878  
 CDD Items 1 through 4 04/23/76  
 5 and 6 05/12/76  
 Narrative: Reportedly shipped on schedule.
- 6.86 Cover and Manuals for Oscilloscope  
 Tektronix  
 PO 64287: Items 1, 2 \$59  
 CDD 05/12/76  
 Narrative: Reportedly shipped on schedule.
- 6.87 Microphone and Protective Accessories  
 B&K Instruments, Inc.  
 PO 64339: Items 1 through 4 \$869  
 CDD Items 2, 3, 4, 05/01/76  
 Item 1 07/15/76  
 Narrative: All received 04/09/76
- 6.88 Communication and Signal Protector  
 PR 76ERF5150  
 Wanted 05/15/76  
 Narrative: In process.
- 6.89 Electric Field Meter  
 PR 76ERF6024  
 Wanted 06/01/76  
 Narrative: In process
- 6.90 Antennas: TV-VHF/FM  
 PR 76ERF6019  
 Wanted 06/01/76  
 Narrative: In process.
- W.O. 842-514: Lyons Electrical Test Area  
System Control Facilities
- 6.91 Assembly of Cables  
 WEDA Instruments  
 PO 64040: Items 1, 2 \$3,600  
 CDD 05/15/76  
 Narrative: Issued 03/16/76

- 6.92 Power Supply  
 Abbott Transistor Labs.  
 PO 64407: Item 1 \$152  
 CDD 04/23/76  
 Narrative: Expected on 05/28/76
- 6.93 Gell-Cell Batteries  
 Jas. J. Bakcer Co.  
 PO 64408: Item 1 \$165  
 CDD 04/23/76  
 Narrative: Received 04/22/76
- 6.94 Lightning and Surge Protector  
 PR 76EPGBO770  
 Wanted 06/01/76  
 Narrative: In process.
- 6.95 Solder Sleeves  
 G. S. Marshall Industries  
 PO 64178: Item 1 \$233  
 CDD 04/09/76  
 Narrative: Partial received; balance being expedited.
- 6.96 Cable Boot  
 Raychem N. W. Sales Office  
 PO 64164: Item 1 (part of) \$230  
 CDD 04/22/76  
 Narrative: Being expedited.
- W.O. 842-515: Moro Mechanical Test Line No. 1  
Instrumentation
- 6.97 Industrial Type Trailer  
 Cost Leasing Co.  
 C 6312N: Item 2 \$21,800  
 CDD 06/07/76  
 Narrative: Negotiated. Awarded 04/28/76. Contractor reported on 05/04/76 that he expects to meet CDD. Preliminary delivery by CDD is to Ross, for installation of BPA-furnished equipment. Final delivery, within 14 days after receipt, is to site.
- 6.98 Sanitary Facility for Trailer  
 Monogram Industries  
 PO 64083: Item 1 \$4,940  
 CDD 04/05/76  
 Narrative: Ready to ship. Awaiting only clearance/approval to State of Oregon, which is to hold a special meeting on this on 05/11/76. Vendor expects to ship on 05/12/76.
- 6.99 Strain Gage Equipment  
 Oiltech c/o Brett Ross, Inc.  
 PO 64010: Items 1, 2 \$655  
 CDD 04/15/76  
 Narrative: Received all 04/23/76

6.100 Control Console Equipment  
 GF Business Equipment Co.  
 PO 64099: Items 1 through 19 \$1,509  
 CDD 04/15/76  
 Narrative: Being expedited.

6.101 Digitizer  
 Colorado Video, Inc.  
 PO 64014: Item 1 \$4,500  
 CDD 04/26/76  
 Narrative: Received 04/13/76

6.102 Closed Circuit TV Equipment  
 Videsonics, Inc.  
 PO 64011: Items 1.a through 1.0 \$7,342  
 CDD 04/15/76  
 Narrative: Received all except one unit of Item 1.1

6.103 Wind Speed Instruments  
 Climatronics Corp.  
 PO 63739: Items 1 through 6 \$2,842  
 CDD 04/16/76  
 Narrative: Scheduled to ship 04/30/76

6.104 Instrument Shelter  
 Weather Measure \$215  
 PO 63762: Item 1  
 CDD 05/05/76  
 Narrative: Received 03/16/76

6.105 Tower 48 Foot  
 EZ Way Products  
 PO 63761: Item 1 \$613  
 CDD 05/05/76  
 Narrative: Received 03/18/76

6.106 Atmospheric Instruments  
 MEE Industries  
 C 6300N: Item 2 \$9,975  
 CDD 07/27/76  
 Narrative: MEE expects to meet CDD.

6.107 Weather Measuring Equipment  
 Climatronics Corp.  
 PO 64801: Items 1 through 6 \$1,650  
 CDD 06/15/76  
 Narrative: Issued 04/22/76

6.108 Analog Filter  
 Rockland Systems Corp.  
 PO 64683: Items 1, 2 \$3,007  
 CDD 06/01/76  
 Narrative: Issued 04/16/76

- 6.109 Accelerometers  
 Bell & Howell Co.  
 PO 64284: Items 1, 2 \$61,466  
 CDD 06/30/76  
 Narrative: Issued 03/26/76
- 6.110 Communications System  
 PR 76ERF7016  
 Wanted 07/01/76  
 Narrative: In process.
- 6.111 Staging, 1500 lv. rated Load  
 PR 76ERF7015  
 Wanted 07/15/76  
 Narrative: In process.
- 6.112 D-C Voltmeter  
 United Radio Supply  
 Cash PO 1072 \$115  
 CDD 05/06/76  
 Narrative: Received 05/06/76

7. Mechanical Test Program

Static and dynamic testing of tower 1/4 is currently in progress. It is anticipated that testing can be completed by May 21 so that stringing of the line can begin. Work is continuing on the preparation of a detailed test program. A project recommendation has been submitted to cover the structural/mechanical and maintenance test programs for the fourth quarter of FY 76 and the transition quarter.

Power is now available at the test site and the instrumentation installed on the John Day-Grizzly line at Tower 16/4 is operational. The preliminary wind study has been discontinued due to dismantling of the wind instrumentation towers to facilitate stringing.

8. Electrical Test Program

The Branch of Transmission Design will coordinate software development for Lyons data analysis. A draft outline of the statistical analysis routine has been prepared and circulated to users for comments. The Task Force is organizing a short course on regression analysis for those involved with data analysis of the 1100 kV Project. A draft of the insulator evaluation testing program for Lyons has been prepared and is now being reviewed. The preenergization testing program is now being prepared.

9. Biological Test Program

The contract to conduct biological studies at the site of the Lyons UHV Test Facilities was awarded to Battelle-Pacific Northwest Laboratories of

Richland, Washington, on April 21, 1976, in the amount of \$197,650. The Battelle resident scientist at Lyons is Mr. John Hedlund. Mr. Hedlund will live in one of the nearby towns and will be on site daily throughout the study period which extends through October 1978. The Battelle Project Manager, Dr. Lee Rogers, along with Mr. Hedlund, described the biological studies program to BPA personnel on May 7. Studies underway at this time are primarily directed toward an inventory of plants and animals at the Lyons site. During the summers of 1977 and 1978 cattle will be brought onto the site and observations will be made of their behavior. During the same time a honey bee study will be conducted which will be coordinated with a similar study being sponsored by EPRI.

10. Hotline Maintenance Test Program.

Starting May 21, a list of tools will be developed. Initial effort will be in the development of a conductor cart for Moro.

At Lyons, sometime between September 1 and October 1, Portland Area Line Maintenance is scheduled to change out one deadend and one "V" string insulator assembly of porcelain or glass and replacing it with Sediver long-rod plastic insulators. We will be working with Design and Portland Area to develop special tooling and techniques.