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TITLE

A PROPOSAL FOR EQUITABLE IPD ELECTRICAL POWER COST DISTRIBUTION BETWEEN AREAS

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AUTHOR

V. G. Blanchette

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July 14, 1958

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A. R. Maguire

By Authority of SE Gudisen
RLO 4, 11-23-93

By DK Hanson, 12-20-93

Verified By Jerri Maly 1-5-94

AREA ELECTRICAL POWER DEMAND
EQUITABLE COST DISTRIBUTION

The attached proposal for equitable power cost distribution was assembled at the request of Financial Operation to outline a method of apportioning the interruptible power demand purchased for IPD. It is based on estimates and requests from the individual areas as used to purchase power. We believe the proposal has the flexibility necessary to handle the various classes of power and will assist the areas in controlling power costs.

We would appreciate having your comments on this method of distributing costs among the 100 areas. If you concur, please indicate directly to C. E. Reed, Financial Operation, with a copy to my office.

ORIGINAL SIGNED BY
R. T. JASKE

Supervisor
Water Plant & Utilities Engineering
Plant and Industrial Engineering
FACILITIES ENGINEERING OPERATION

RT Jaske:VGB:nbs

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A PROPOSAL FOR EQUITABLE IPD ELECTRICAL POWER
COST DISTRIBUTION BETWEEN AREAS

By

V. G. Blanchette

WATER PLANT & UTILITIES ENGINEERING
PLANT AND INDUSTRIAL ENGINEERING
FACILITIES ENGINEERING OPERATION
IRRADIATION PROCESSING DEPARTMENT

July 10, 1958

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A PROPOSAL FOR EQUITABLE IPD ELECTRICAL POWER

COST DISTRIBUTION BETWEEN AREAS

INTRODUCTION

Assistance has been requested by Financial Operation to determine the percent of firm and interruptible power used in each area for cost distribution purposes. Also, Power Operations have suggested that the power cost distribution be reviewed. In consideration of these requests, and with the use of improved demand instrumentation within the 151-B, D, and F substations, a proposal for equitable IPD electrical power cost distribution between areas is presented for acceptance or comment by Area Management.

RECOMMENDATION

1. It is recommended that costs for firm power contract demand as billed by BPA and as allocated by Utilities Operation to IPD be apportioned between the respective 100 Areas in accordance with base load estimates as follows:

TABLE I

ESTIMATED FIRM POWER - MW

<u>Area</u>	<u>To Aug. 31</u> <u>Base Load</u>	<u>% Total</u>	<u>After Sept. 1</u> <u>Base Load</u>	<u>% Total</u>
B	60.5	22.4%	64.5	23.2%
Export (Max.)	2.0	.7	2.0	.7
D, DR	61.5	22.8	65.1	23.4
F	30.2	11.2	30.2	10.8
H	31.0	11.5	32.0	11.5
KE	42.5	15.7	42.5	15.2
KW	<u>42.5</u>	<u>15.7</u>	<u>42.5</u>	<u>15.2</u>
TOTAL (Undiversified)	270.2	100.0%	278.8	100.0%

These values are equivalent to the base loads estimated in document HW-55294 (Secret), "Electrical Power Forecast - FY 1959", V. G. Blarchette, dated March 11, 1958, which were used for the purchase of firm power.

2. It is recommended that costs for interruptible power be apportioned between the respective areas in accordance with estimated values used to purchase interruptible power as may be applicable.

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TABLE II
ESTIMATED INTERRUPTIBLE - MW

<u>Area</u>	<u>May</u>	<u>June</u>	<u>July</u>	<u>August</u>	<u>Sept.</u>
B	—	2.3 (1)	2.3	2.3	2.3
C	3.7 (1)	4.0	4.0	4.0	— (4)
D	—	2.3 (1)	2.3	2.3	— (4)
DR	2.3 (1)	2.3	2.3	2.3	1.3 (4)
F	2.3 (2)	2.3 (2)	4.1 (2,3)	4.1 (2,3)	4.1 (2,3)
H	—	2.3	2.3	4.1	3.1 (4)
KE	6.0	5.5 (5)	5.5	5.5	5.5
KW	<u>5.5</u>	<u>5.5</u>	<u>5.5</u>	<u>5.5</u>	<u>5.5</u>
TOTAL	19.8	26.5	28.3	30.1	21.8
(Undiv.)					
INT. POWER	10.	20.	20.	—	—
(Ordered)					
INT. POWER	(4.6519)	(12.9)	(18.)	—	—
USED					
GENERATION	3.0	5.0	3.	—	—
(Control)					

- (1) Added to system subsequent to order for interruptible power.
- (2) Seventh pump is shown with base load in HW-55294.
- (3) Eighth pump (1.8 MW Est.).
- (4) Base load after September 1 is revised to reflect firm power change.
- (5) Interruptible power not used in KE because of Primary Pump motor.

3. If the HAPO firm power contract is exceeded, the base load will be adjusted to reflect an appropriate increase for areas responsible for setting a new peak.

DISCUSSION

Firm Power

The HAPO firm power contract demand is 285,529.3 KW^(a) as of the peak set December 18, 1957. For estimating purposes, the power cost to IPD is approximately \$1.71/KW demand/month^(b). This includes the cost of transmission and distribution within HAPO. The demand is apportioned by Utilities Operation in accordance with the demand record at the time of the peak as follows:

- (a) Includes line losses and other contract adjustments.
- (b) Includes Utility costs.

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MAY 1958

CPD	10,500	KW
FPD	5,200	KW
IPD	<u>269,829.3</u>	KW
TOTAL		285,529.3 KW

In the past, the electric power costs have been apportioned between the areas based on maximum demand hourly record at each 151 substation. These values were changed only if a new peak demand was set for H&PO. This general method of billing each area was appropriate because firm power is purchased on a basis of one-half hour demand and is applicable through the next eleven months following a new peak. The hourly demand was the only information available to be used for apportioning load between areas.

If, in the future, the firm power contract is exceeded, the base load for cost purposes will be adjusted to reflect an appropriate increase for areas responsible for setting a new peak. This will be the same procedure as was followed previously but will be based on one-half hour demand records from the new instruments installed in 151-B, D, and F.

The change in base load in September follows the increase in the firm power contract for additional loads in 100-C, D, DR, and F as listed in document HW-55294.

The use of a "base load" figure is appropriate for cost distribution purposes and is recommended for the following reasons and conditions:

1. Each Area Management may set the "base load" value by requests for power necessary for his operation and is responsible for maintaining demand within this base value during maximum demand (H&PO) periods.
2. Firm power has been purchased on the basis of area requests for power with appropriate diversity allowance.
3. It has been economical to purchase interruptible power for summer peak loads. A workable "base load value" is necessary to estimate the interruptible power required.
4. An area may exceed its "base load" value to the extent of interruptible power purchased for that area. The participation of each area in the distribution of interruptible power costs will be based on power requested beyond the "base load", as may be applicable.
5. An area may exceed its "base load" value for short periods for pump changes, etc., during off-peak (H&PO) periods without penalty.
6. The generators at KE and KW are capable of controlling the H&PO peak demand with the aid of certain selective load control such as pump changes, tests, etc.

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Interruptible Power

The economic advantage of interruptible power is that it is purchased on a monthly basis. This is compared with firm power purchased on a yearly basis. During May, June, and July of this year, the cost of interruptible power per KW demand per month is the same as for firm power (\$1.463 per KW month)^(c). Such an advantage is useful when seasonal loads vary as has been the case at HAPO.

The cost of interruptible power will vary depending on stream flows and BPA System loads, and it can be interrupted. We have been assured an adequate supply of this power through the middle of August, 1958. After this time, we will get assurances only for the following month until adequate stream flows are recovered next spring. In future months, it may be necessary that HAPO be billed for interruptible power ordered but not used. If this power is obtained from BPA, the cost may be the same as it is now per KW per month. Area Management will have the responsibility of specifying the quantity to be purchased while Facilities Engineering Operation will furnish estimates and recommendations.

Should BPA power be interrupted, arrangements have been made with a utility pool to replace this power. This class of power will cost approximately \$0.005 to \$0.007 per KW hour and can be used economically for short periods. It will require some advanced planning and reasonable forecasts of the maximum winter power demand (November to March).

As long as interruptible power is billed on the "demand used" basis, it is proposed that the cost distribution be made in proportion to the estimated quantities in Table II, provided the extra equipment is actually used that month. If it is necessary to purchase this power on a "pay--used or not" basis, then it is proposed that each area be billed accordingly.

SAVINGS BY USE OF INTERRUPTIBLE POWER

To cover our power requirements in May and June, with firm power, it would have been necessary to increase the contract demand by 15 and 21 MW, respectively (diversified). Due to unforeseen pump troubles and other operating conditions, the actual demand was 4.7 and 12.9 MW, respectively. The favorable interruptible power arrangement provided an economic advantage due to these conditions. For the two months, an estimated savings of \$26,000 was realized. This does not include the possibility of savings in the next eleven months which depends on the ratio of the maximum half-hour demand in previous months to the individual month half-hour demand.

(c) Utility and line loss costs are included in the firm power unit cost.

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