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HW-21488

7-27-51

This Document consists of
4 Pages No. 11 of
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COPY 1 OF 1.

INCREASED WATER FLOWS
AND PRESSURES TO 105 BUILDINGS

Classification Cancelled and Changed To
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By Authority of CG PR-2
CA Bruman 3-6-92
By Pm Eck 5-23-94
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Richland, Washington
July 27, 1951

R. O. Mehan
Assistant Superintendent
"P" Division
Richland

SUBJECT: INCREASED WATER FLOWS AND PRESSURES TO 105 BUILDINGS

Reference: HW-21096, R. O. Mehan to H. F. Measley
HW-21065, M. W. Carbon to File

Your reference letter to H. F. Measley, Document HW-21096, inquires regarding changes in equipment, so that various proposed flows of process water to each of the present production units, at several 105 control room pressures, may be effected. The proposed conditions are shown in the following table.

	<u>Col. A</u>	<u>Col. B</u>	<u>Col. C</u>
* 105 Control Room Pressure	400 psi	475 psi	475 psi
105-B normal flow	36,000 gpm	39,000 gpm	40,200 gpm
105-D " "	36,500 gpm	39,500 gpm	40,700 gpm
105-F " "	34,000 gpm	37,000 gpm	38,100 gpm
105-DR " "	36,500 gpm	39,500 gpm	40,700 gpm
105-H " "	41,800 gpm	45,500 gpm	46,800 gpm

For the purpose of calculations upon which this letter is based, the pressure used here is that which is recorded at the 105 control room "inlet" panel. It is actually the top of riser pressure, plus static head between the recorder and the point of pressure tap.

In order that the conditions in Col. A may be achieved, the following requirements apply:

- Present equipment and practice is adequate for normal Col. A flows. Tests must be conducted to establish the required number of operating pump sets in 190 pumprooms to satisfy the current pressure decay curve demand at unplanned electrical outage, (HW-21065), under the new conditions. Thus will be determined whether present practice (one set on stand-by and maintenance status) can be retained; or whether it will be necessary to operate the total number of installed pumps in any area.
- Each pile orifice pattern must be altered. Conversely, without pattern change, the following will prevail.

	<u>Present Conditions</u>	<u>New condition without orifice pattern change</u>
<u>Area</u>	<u>(7-23-51)</u>	
100-B	34,400 gpm at 375 psi	35,600 gpm at 400 psi
100-D	35,300 " " 365 "	36,900 " " 400 "
100-F	33,500 " " 358 "	35,400 " " 400 "
100-DR	40,500 " " 397 "	40,800 " " 400 "
100-H	42,300 " " 398 "	42,400 " " 400 "

Tests (item a) will cost \$100 per area, and can be run during pile shut-down. They will consume, for each area, approximately six hours.

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Inasmuch as the decision as to whether or not the orifice patterns will be altered (item b) rests with others than Power Division, and that pattern alterations have been completed previously under the jurisdiction of "P" Division, we believe that the merits of this change, as well as the time and cost involved, can best be estimated by your own group.

Fulfillment of the proposed requirements in Cols. B and C necessitates certain alterations and additions to present equipment in all areas, and changes in operating practice in some. The complexity of the overall situation indicates the use of the following method of presentation:

<u>Required changes, various areas</u> (Based on no production interruption)	<u>For Column B conditions</u>	<u>For Column C conditions</u>
1. Replacement of each 190 secondary pump with one of identical type and with similar characteristic curve shape, but with the largest available diameter impeller and heavier casing.	B, D, F, DR, H	B, D, F, DR, H
2. Replacement of each 190 primary pump with one of identical type and characteristics, but with heavier casing.	B, D, F, DR	B, D, F, DR
3. Replacement of each 190 turbine with one of 750 H.P. capacity, at higher efficiency than present.	B	B, D, F.
4. Additional subsidence basin(s) and filter(s) at 183 Building.	B, F (2) (1)	B F (2) (1)
5. Replacement of each impeller now in 183 process pumps with largest available diameter impeller.	B, D, F, H	B, D, F, H
6. One additional pump in 181 Building, identical to present pumps.	B, D, F, DR, H	B, D, F, DR, H
7. Normally operate <u>all</u> installed pump sets in 190 pumproom. (Operating practice change)	D, F, DR	DR

On the above bases, it is estimated that the completed cost for the additions and alterations will be as follows:

	<u>Column B conditions</u>	<u>Column C conditions</u>
100-B	\$ 1,287,000	\$ 1,299,000
100-D	146,000	158,000
100-F	762,000	774,000
100-DR	152,000	152,000
100-H	130,000	130,000

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As to time for completion, the best estimate that can be given now, in view of critical conditions of vendor's plants, is between fourteen and twenty months for any area. This could be firmed up when proposals were prepared for the respective projects.

All of the above information is based on the adoption, in all areas, of non-acceleration of the turbines at power outage.

In regard to your suggestion that pumping equipment similar to that proposed for 100-C Area be considered here; such installations would require lengthy production shut-downs, and would necessitate engineering studies of formal project magnitude.

J. A. Todd
Superintendent
POWER DIVISION

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