BFP'S

BOILER FEED PUMPS

Gt-300 and 400 heat recovery units are each quipped with two Bingham-Williamette 4x6x10C MSD high pressure boiler feed pumps. These pumps, P300 A/B and P400 A/B, are driven by 1000 HP Siemens Allis, 4160 V motors.

These single extraction centrifugal pumps supply feedwater to both the medium pressure (235 psig) and high pressure (1250 psig) boilers. Discharge capacities are 840 GPM @ 340 psig.

The lubricating oil for the pump bearings of each pump is supplied normally by a gear-type oil pump driven by the main pump shaft. There is a standby electric (480 V) driven auxiliary pump which will start on low lube oil pressure. In the case of low lube oil pressure and the auxiliary pump starts, an alarm will sound. In the event the auxiliary oil pump does not start and/or oil pressure drops to approximately 3 psig then the BFP will trip. The auxiliary oil pump can be tested by putting the switch (located in the mechanical package SWG room) in the "Hand" position.

The boiler feed pumps are equipped with recirculation lines to provide protection against overheating during low pumping rates. When a pump requirement is less than the minimum flow requirement to keep the pump cool, the recirculation valve will open.

The valve operates as follows: The ARC valve is installed in the pump discharge line in the position of the main check valve it replaces. Decreasing flow through the valve causes the spring loaded disc to move toward its seat. At a flow rate determined by the minimum flow requirement through the

pump, the disc triggers the pilot valve through the lever. This vents the pressure on the head of the piston. Pressure acting on the opposite side of the piston opens the bypass valve, permitting flow through the multi-stage cascade element. The flow rate through the bypass valve is equal to the minimum flow requirement of the pump. The directional changes of the successive helical flutes as well as the multiple orifices provide for the absorption of pressure energy.

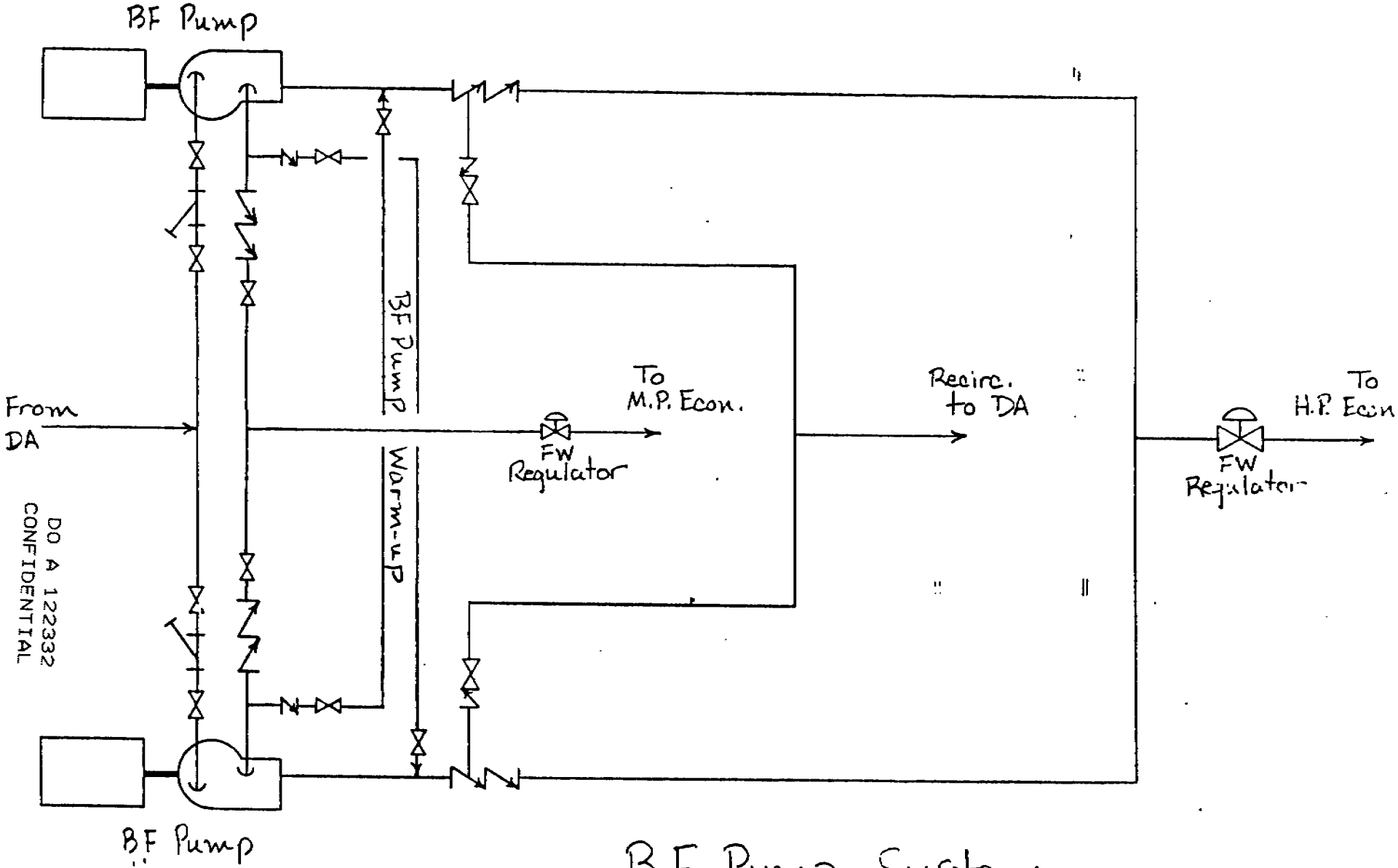
The bypass valve will remain in open position as long as the pilot valve is open. This corresponds with the position the disc assumes at flow rates between an established low flow and no flow through the mani check valve. As the flow rate, the rising disc allows the pilot valve to close; pressure entering the chamber over the piston through the annular clearance around the pilot valve stem closes the bypass. (See Figure 1)

The pumps are equipped with water cooled seals. Water for the seals is supplied from the high pressure discharge and circulates through the seals and CT water cooled heat exchangers located on suction and discharge ends of the pump.

The discharge lines from each pump are equipped with check valves which shut to prevent the pumps from backspinning on shut down and subsequent loss of header pressure.

There is a warm-up line on each pump located on the medium pressure discharge line. Water is taken from the medium pressure discharge of the in-service pump and is piped into the high pressure discharge line of the standby pump, circulating through the pump back into the suction header.

Switches for starting and stopping the BFP's are located on the HRU boards in the control room.

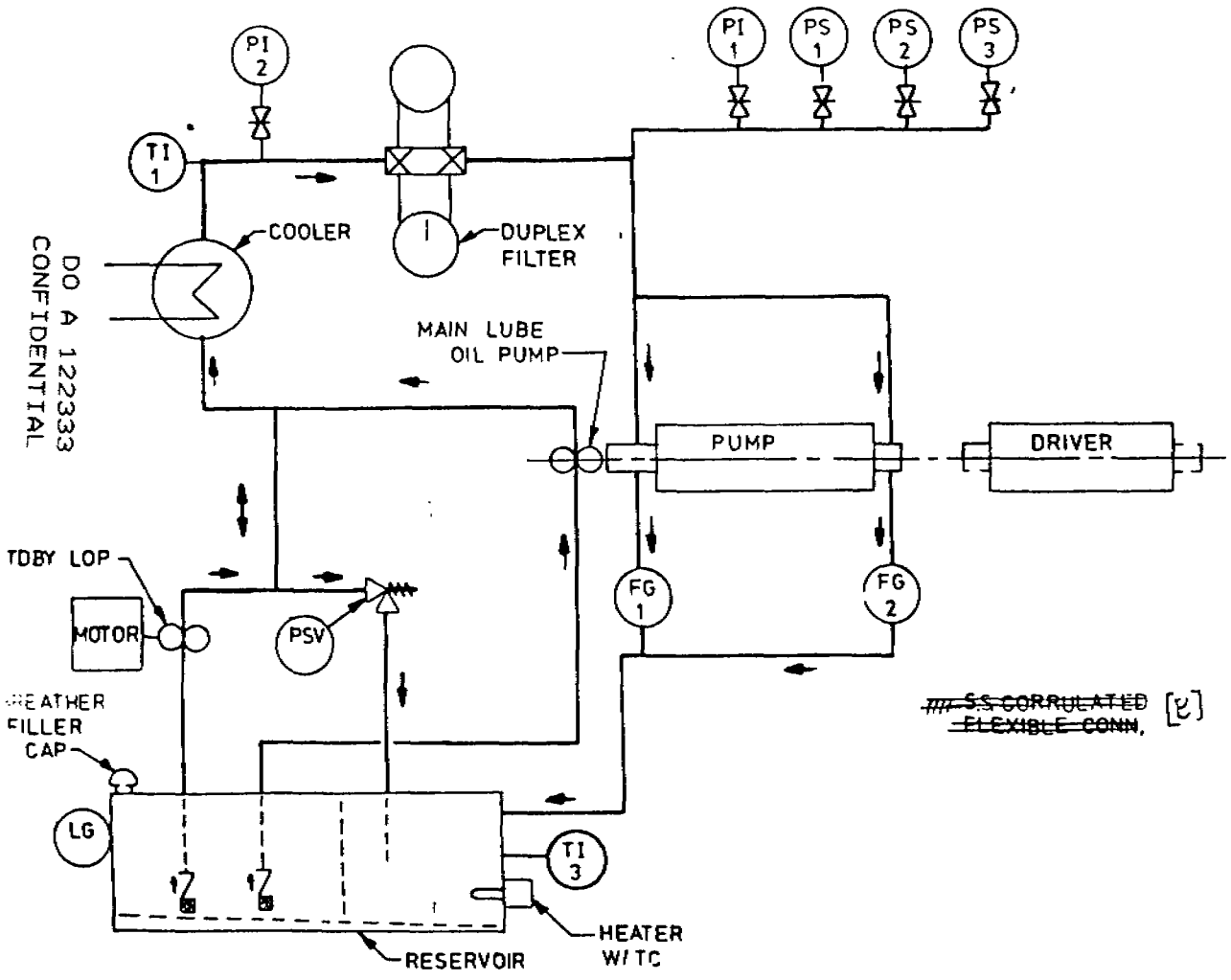


B.F. Pump System

MASTER B-39152

B1B641/4-1

REV.	REVISION DESCRIPTION	INIT.	APPD.	DATE
[A]	ADD HOSE NOTATION (4 LOC.)	RJB	[illegible]	3/16/82
[B]	Removed Hose; Added Ex. Loops	RJB	RJM	5/14/82



DO A 122333 CONFIDENTIAL

DESIGN DATA

LUBE OIL SUPPLY: PRESS. PSIG. 10 -12
TEMP. DEG F. 120
FLOW, GPM, 6

HEAT LOAD, BTU/HR. 15,000

COOLING WATER SUPPLY: PRESS. PSIG. 150max;
TEMP. DEG F 95°; FLOW, GPM. 12 max

CUSTOMER DATA

USER: DOW CHEMICAL

INSTALLATION AT: PLAQUEMINE, LOUISIANA

PURCHASER:

P.O. NO. 72322-L507

ITEM NO:

S O NO: 1B641 / 1B644

Bingham-Willamette Company	PORTLAND OR SHREVEPORT LA	PATT NO	LUBE OIL SYSTEM SCHEMATIC			B1B641/4-1	REV B
Bingham-Willamette Ltd.	VANCOUVER B.C. CAMBRIDGE ONT	REF	FIRST USED	DR RJB	APPD RJM DATE 1-11-82	SCALE NONE	

FORM NO. 567-2

MASTER B-39152

FIGURE NO. 1