DUQUESNE LIGHT COMPANY

Beaver Valley Power Station

Unit 1

INSERVICE TESTING (IST) PROGRAM FOR PUMP AND VALVES

Proposed Revision 1E

R J Grubb for K L Ostrowski 3-23-94 Unit Operations Manager Review/Date	Pages Issued 5	OSC Review Date BV-OSC-12-94 3-24-94
A Reed 3/25/94 Approved by Date		

This "Proposed Revision" was made against Revision 11 of the present Unit 1 IST Program.

BVPS-1 IST

PUMP TESTING OUTLINE

Pump Name: 2A Boric Acid Transfer Pump	Pump Number: 1CH-P-2A	Code Class: 3	Dwg. O&M No.: 7-3 Dwg. Coord.: C-3	System: 7 Chemical and Volume Control
Function: Chemical Shim and Emergency Boration Supply	Type: Centrifugal	Remarks: See RR1, RR2 and RR3		

Parameter	IOST (Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
Pi	7.1 (Q)	RR2	No installed instrumentation to measure suction pressure. Calculate Pi from the level in the Boric Acid Storage Tank, [LI-1CH-106(161)], Control Room.
	7.13 (R)	RR2	No installed instrumentation to measure suction pressure. Calculate Pi from the level in the Boric Acid Storage Tank, [LI-1CH-106(161)], Control Room.
ΔP	7.1 (Q)	X	ΔP is calculated using the pump discharge pressure indicator [PI-1CH-110], local, and the calculated Pi, Control Room.
	7.13 (R)	X	ΔP is calculated using the pump discharge pressure indicator [PI-1CH-110], local, and the calculated Pi, Control Room.
Q		RR3	No installed instrumentation to measure flow rate quarterly.
	7.13 (R)	X	Flow rate measurement by ~~tank level change over time~~ portable ultrasonic flowmeter performed at refuelings.
V	7.1 (Q)	RR1	Portable monitoring equipment using velocity units.
	7.13 (R)	RR1	Portable monitoring equipment using velocity units.
Tb	NA	RR1	Annual pump bearing temperature measurements will not be taken since vibration is measured in velocity units.
L	7.1 (Q)	X	Bearing housing provided with sightglass at oil level reservoir, local.
	7.13 (R)	X	Bearing housing provided with sightglass at oil level reservoir, local.

BVPS-1 IST

PUMP TESTING OUTLINE

Pump Name: 2B Boric Acid Transfer Pump	**Pump Number**: 1CH-P-2B	**Code Class**: 3	**Dwg. ~~OM~~ No.**: 7-3 **Dwg. Coord.**: G-3	**System**: 7 Chemical and Volume Control
Function: Chemical Shim and Emergency ~~Boration~~ Supply	**Type**: Centrifugal	**Remarks**: See RR1, RR2 and RR3		

Parameter	10ST (Frequency)	Req'd	Comments
N	NA	NA	Constant speed induction motor.
Pi	7.2 (Q)	RR2	No installed instrumentation to measure suction pressure. Calculate Pi from the level in the Boric Acid Storage Tank, [LI-1CH-108(163)], Control Room.
	7.14 (R)	RR2	No installed instrumentation to measure suction pressure. Calculate Pi from the level in the Boric Acid Storage Tank, [LI-1CH-108(163)], Control Room.
ΔP	7.2 (Q)	X	ΔP is calculated using the pump discharge pressure indicator [PI-1CH-105A], local, and the calculated Pi, Control Room.
	7.14 (R)	X	ΔP is calculated using the pump discharge pressure indicator [PI-1CH-105A], local, and the calculated Pi, Control Room.
Q	7.2 (Q)	RR3	No installed instrumentation to measure flow rate quarterly.
	7.14 (R)	X	Flow rate measurement by ~~tank level change over time~~ performed at refuelings. portable ultrasonic flowmeter,
V	7.2 (Q)	RR1	Portable monitoring equipment using velocity units.
	7.14 (R)	RR1	Portable monitoring equipment using velocity units.
Tb	NA	RR1	Annual pump bearing temperature measurements will not be taken since vibration is measured in velocity units.
L	7.2 (Q)	X	Bearing housing provided with sightglass at oil level reservoir, local.
	7.14 (R)	X	Bearing housing provided with sightglass at oil level reservoir, local.

RELIEF REQUEST 3

Pump Mark No(s).:

CH-P-2A
CH-P-2B

Code Test Requirement: Measurement of flow and ΔP.

Basis for Relief: The function of the Boric Acid Transfer pumps is to supply borated water to the suction of the Charging/ HHSI pumps for injection into the RCS. Testing the pumps in that flow path is impractical because it could result in a reactor shutdown. The flow path available to test these pumps is shown on the attached figure. There is no installed flow instrumentation in these recirculation lines. During normal plant operations, the pumps are tested through [RO-1CH-ORBA-1 (2)], the restricting orifices in the minimum flow fixed resistance recirculation lines. Therefore, the flow is assumed to be fixed and at its reference value. Delta-P is then measured and compared to the acceptance criteria. A review of past test results has shown this test method is capable of assessing pump performance and detecting degradation.

In accordance with Position 9 of the GL 89-04, the pumps are also tested through their full-flow recirculation flow paths through [HCV-1CH-110 (105)], at a refueling frequency. For the full-flow test, the flow will be measured by a portable ultrasonic flow meter that has been "wet-flow" calibrated to within the ±2% accuracy required by ASME. In order to install the flow meters, however, the insulation must be removed from the line and the heat trace elements must be moved away from where the transducers and tracks will be installed. Moving the heat trace elements places stresses on them, which could cause them to break.

The use of the portable flow meter and full-flow recirc line was considered for the quarterly test. It was determined, however, that use of the full-flow line was impractical for quarterly testing. A design change to the plant would be required and additional flow instrumentation would have to be purchased to permanently install the ultrasonic flow meter. In

addition, in order to achieve a substantial flow rate, flow must be aligned through [HCV-1CH-110 (105)]. If the pump under test was required for Emergency Boration, the HCV would have to be isolated in order to ensure enough boric acid solution would be injected into the RCS.

Performing the full-flow test quarterly would not enhance our ability to assess the operability of the pumps enough to compensate for the increased cost.

Therefore, because of the difficulty in installing the flow meter for each test and the cost of having it permanently installed, the use of the full-flow recirculation flow path will be limited to once during refueling outages.

Alternate Test:

Test quarterly through a fixed-resistance minimum flow recirculation line: assuming flow to be constant and measuring delta-P in OST 1.7.1, 2.

Test at a refueling frequency at "full-flow" through a larger recirculation line, using a portable ultrasonic flow meter in OST 1.7.13, 14.

Separate vibration reference and acceptance criteria values will be used for the different test conditions of the recirc and full-flow tests.

Boric Acid Transfer Schematic