VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

October 17, 1980

Mr. Harold R. Denton
Office of Nuclear Reactor Regulation
Attn: Mr. Steven A. Varga, Chief
Operating Reactors Branch 1
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Serial No. 854
NO/FHT:ms
Docket No. 50-281
License No. DPR-37

Dear Mr. Denton:

AUXILIARY FEEDWATER (AFW) PUMP ENDURANCE TEST RESULTS
SURRY POWER STATION UNIT 2

Our letter of August 5, 1980, Serial No. 614, reported the results of the required 48 hour auxiliary feedwater (AFW) pump endurance tests for all Surry AFW pumps except the Unit 2 steam turbine-driven pump. This letter transmits the results of this final test performed in late August, 1980.

If you have any questions or require additional information, please contact this office.

Very truly yours,

B. R. Sylvia
Manager - Nuclear
Operations and Maintenance

cc: Mr. James P. O'Reilly

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STEAM TURBINE-DRIVEN AUXILIARY FEEDWATER PUMP ENDURANCE TEST REPORT SURRY POWER STATION, UNIT 2

1. INTRODUCTION

As stated in our letter Serial No. 149/020880, dated March 21, 1980, we have performed the subject tests in accordance with the NRC's letter of September 25, 1979, as revised by the NRC letter dated February 8, 1980.

A 48-hour endurance test has been performed on the Surry Unit 2 Steam Turbine-Driven AFW Pump on 8/30/80. The results of the test performed are summarized below.

2. Test Description

A. The test was run as follows:

After achieving rated speed and pump discharge pressure for the recirculation flow path (described below), the pump was run for 48 hours. Steam temperature was as close to normal operating temperature as practical. The pump was shut down at the end of 48 hours and allowed to cool down until pump temperatures were within 20°F of their values at the start of the test or for a minimum of 8 hours, whichever was longer. The pump was then restarted and run for one hour.

B. Test Method and Instrumentation:

The tests were run with the pump suction lines aligned to the emergency condensate storage tank (ECST) and the pump discharge aligned to recirculate to the ECST at a reduced flow rate. A schematic diagram of this recirculation flow path is shown in Attachment 1 and is the same as that utilized for the existing performance surveillance procedures.

Pump suction and discharge pressures, condensate temperatures, ambient room temperatures and bearing lube oil temperatures were recorded via local gauge indicators.

C. Test Conditions:

As shown in Attachment 2, Table 1, pump speeds and heads did not exceed design operating conditions. Pump flows were acceptable through the recirculation path. Steam temperature was approximately 528°F. Pump head curves are provided as Attachment 3.

D. Bearing Oil Temperatures:

Bearing lube oil temperatures were recorded directly from the bearing housing. The highest bearing oil temperatures were plotted as a function of time and this plot is included as Attachment 4. Note that the highest bearing oil temperature, taken directly from the bearing, did not exceed the design operating maximum of 180°F at anytime during the test.

Bearing oil temperature did, however, tend to follow the condensate temperature which increased over the duration of the test due to pump work. The bearing oil coolers are cooled with recirculated condensate which, as it heats up, will cool the bearing oil less effectively. This is not expected to occur during normal operation of the pumps.

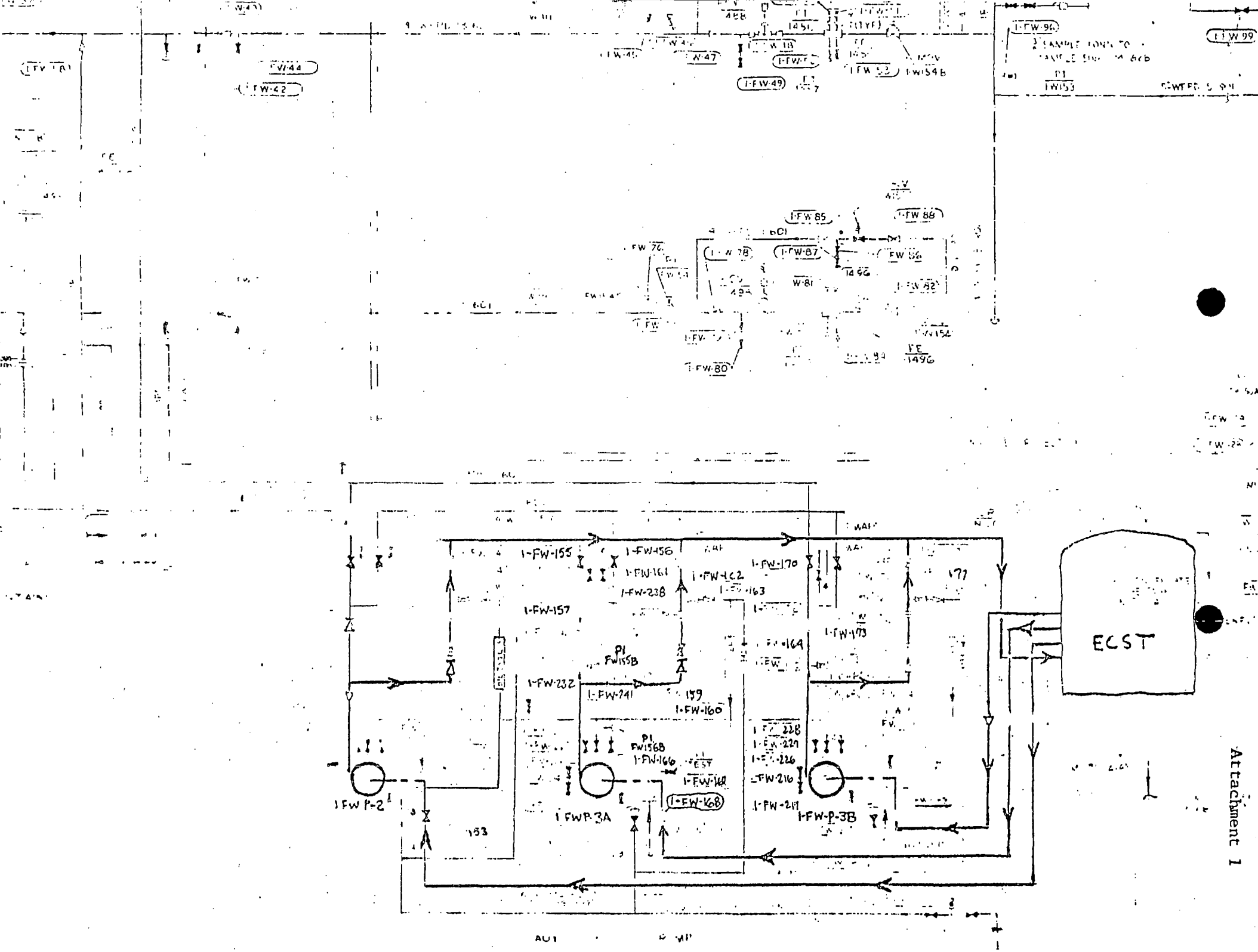
E. Pump Room Environmental Conditions:

Pump room temperature and humidity as a function of time are plotted in Attachments 5 and 6.

The environmental qualification of safety-related equipment in this area, as well as in the rest of the plant, is being addressed by our Environmental Qualification Program established in response to IE Bulletins 79-01 and 79-01B. Mr. Victor Stello received a copy of our letter of June 16, 1980, Serial No. 527, submitting qualification information and providing completion dates for the remainder of our qualification efforts.

Pump Vibration Measurements:

Attachment 2, Table 2, provides pump vibration data taken during the test. Vibration parameters measured did not exceed design allowable limits during the test.



FLOW SCHEMATIC DIAGRAM

Attachment 1

TABLE 1

AFW PUMP TEST-PUMP SPEED AND HEAD PARAMETERS

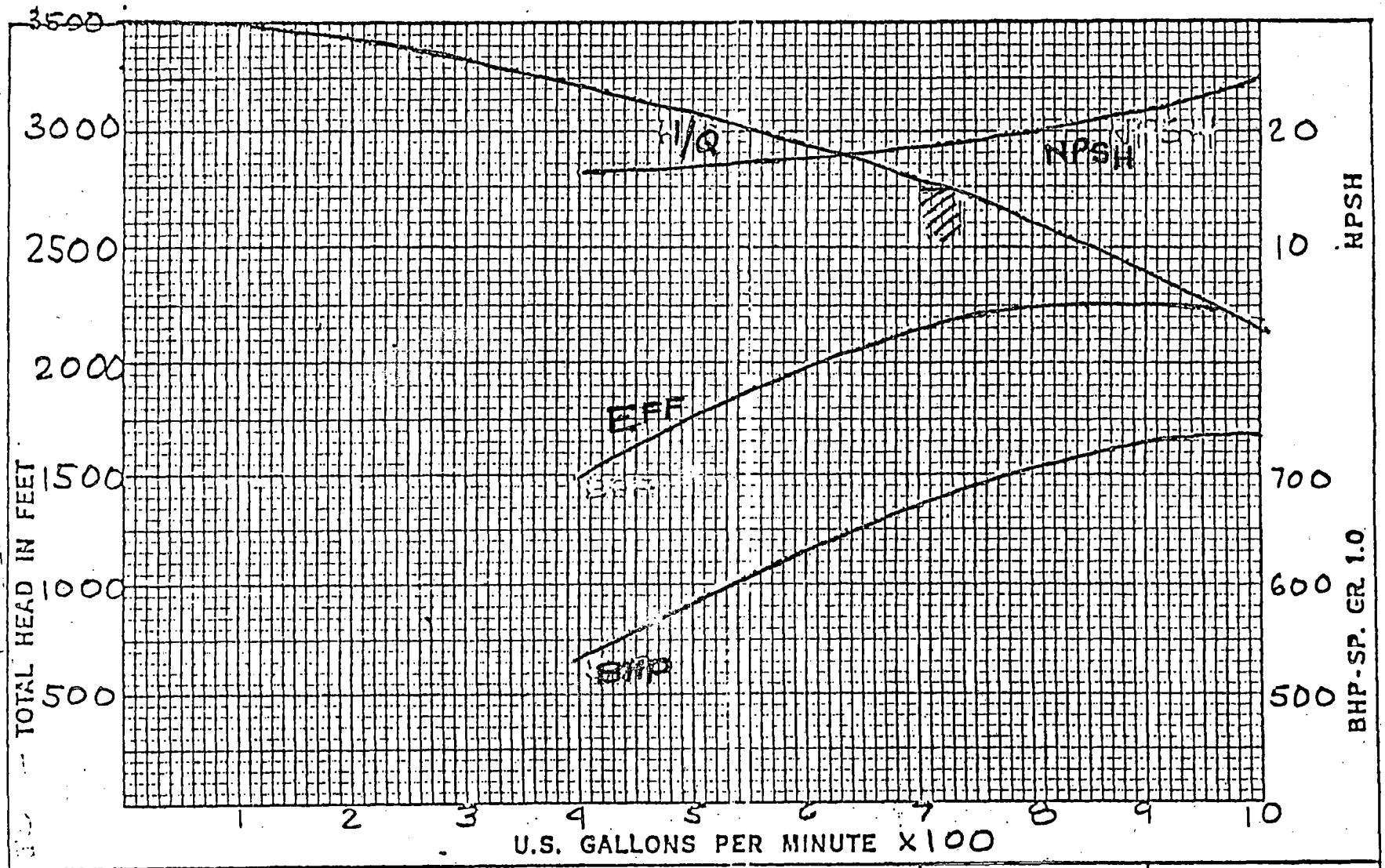
Reference RPM	Measured RPM	Reference ΔP(PSIG)	Measured ΔP(PSIG)	Surry Unit	Pump Number
(Varied)	3780	(None) Not enough Data available	1200	II	2-FW-P-2

TABLE 2

AFW PUMP TEST - PUMP VIBRATION P

Vibration Reference Side(in/sec)	Measured Max. side (in/sec)	Vibration Reference Top(in/sec)	Measured Max. Top (in/sec)	Allowable Max (in/sec)	Pump Number
.54	.54	.56	.56	.99	2-FW-P-2 (Turbine)

CURVES ARE APPROXIMATE. PUMP IS GUARANTEED FOR ONE SET OF CONDITIONS. CAPACITY, HEAD AND EFFICIENCY GUARANTEES ARE BASED ON SHOP TEST AND WHEN HANDLING CLEAR, COLD, FRESH WATER AT A TEMPERATURE OF NOT OVER 65°F.



RING CLEAR. FRONT .012 DIA. / BACK	IMPELLER	Ingersoll-Rand	PUMP SIZE & TYPE	CURVE NO.
MAX. SPHERE 9 16	4HMTA-6M 9 5/8		4HMTA-6	4HMTA-J
EYE AREA 16.7 SQ. IN.			4200 RPM	DATE 12-5-67

Form 70136

ATTACHMENT 2

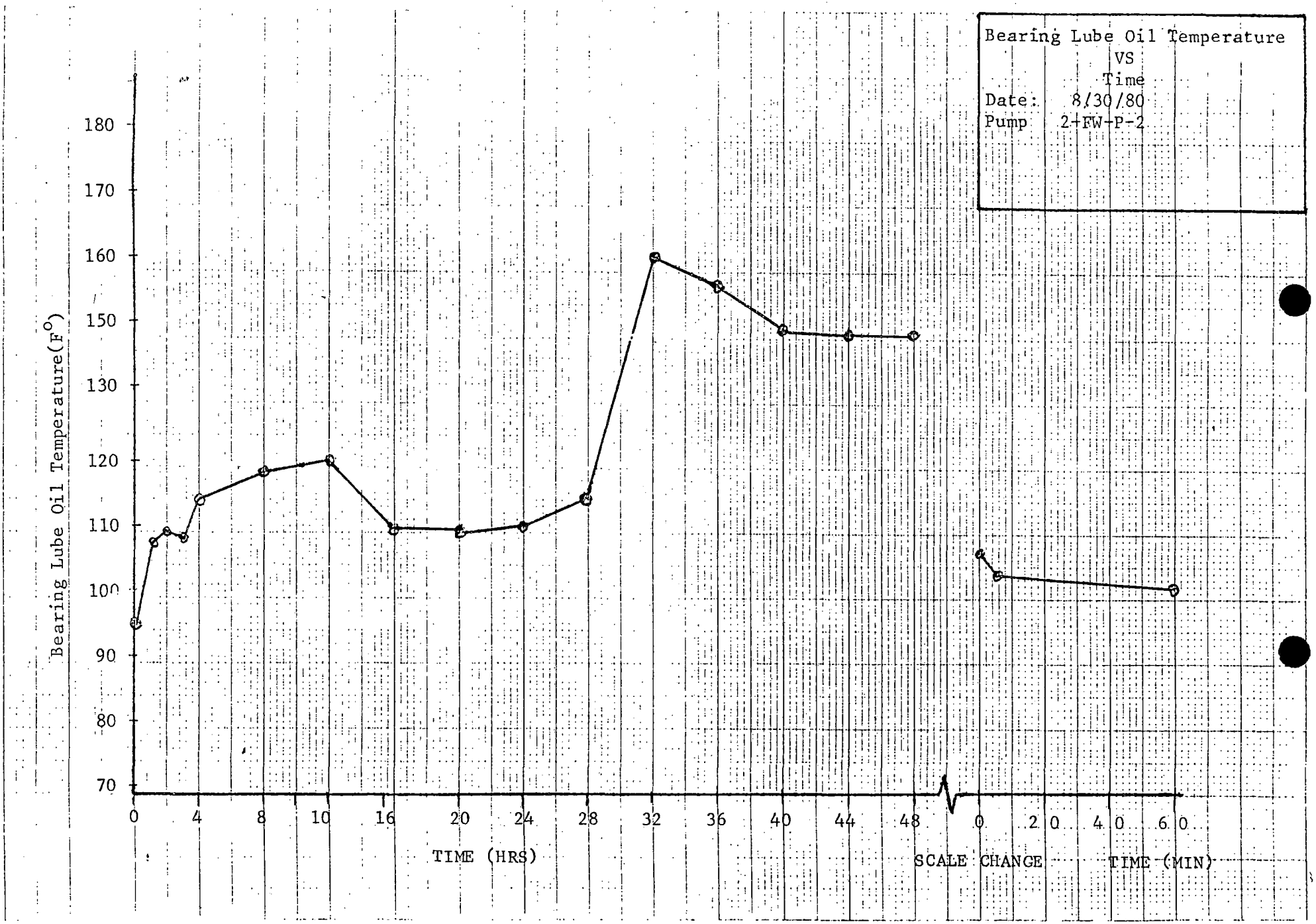
2-FW-P-2

ITEM FW-P-1

Attachment 4

Surry Power Station 2

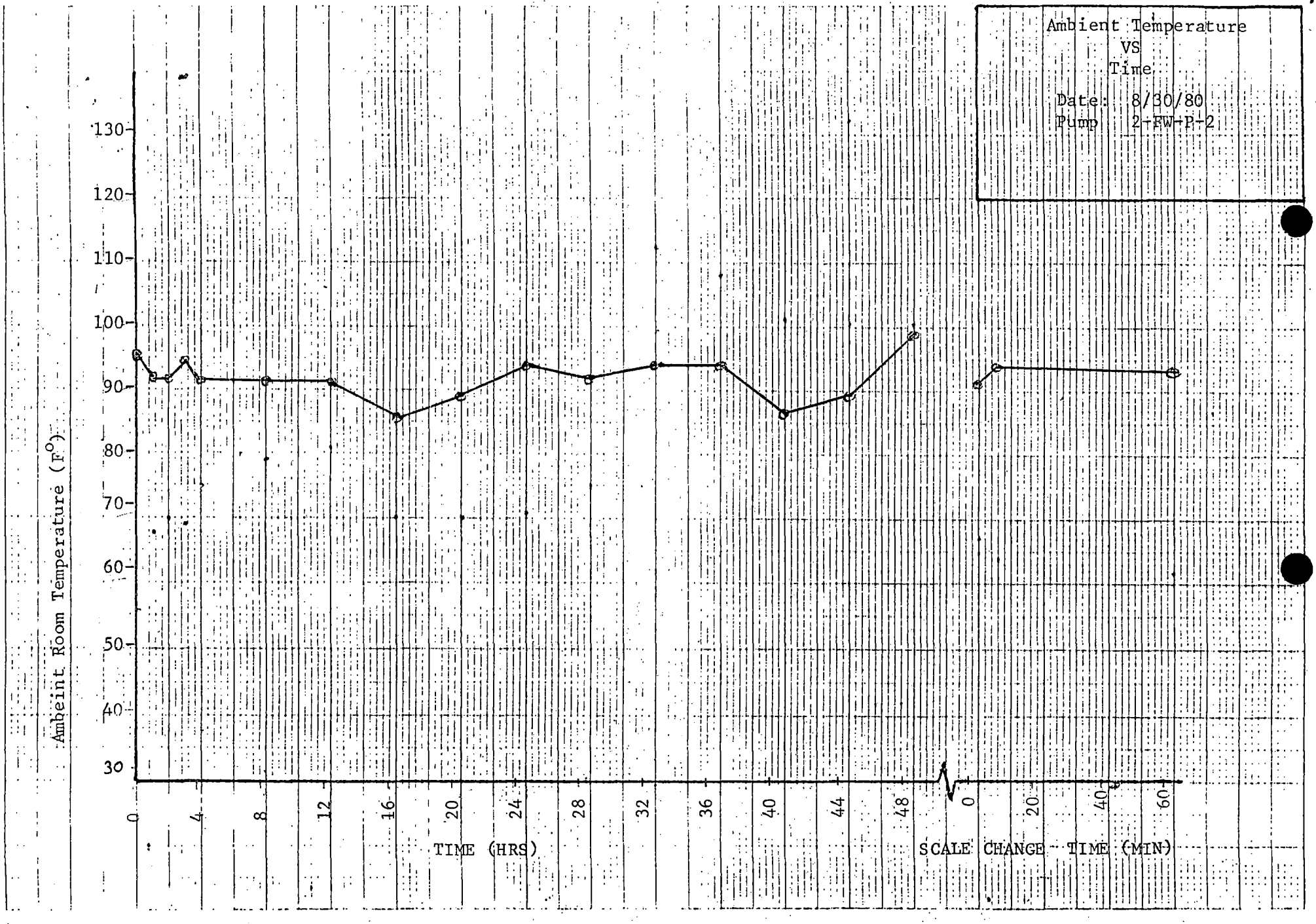
Auxiliary Feedwater Pump 2 Turbine Motor



Attachment 5

Surry Power Station Unit 2

Auxiliary Feedwater Pump 2 (Turbine Driven)



Attachment 6

Surry Power Station, Unit 2

Auxiliary Feedwater Pump 2 (Turbine Driven)