Portland General Electric Company

Charles Goodwin Jr. - Assistant Vice President

July 25, 1980

Trojan Nuclear Plant
Docket 50-344
License NPF-1

Director of Nuclear Reactor Regulation
ATTN: Mr. Robert A. Clark, Chief
Operating Reactors Branch No. 3
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Sir:

Attached please find [illegible]f the supplemental information regarding the Troja[illegible]clear Plant Auxiliary Feedwater (AFW) System, which specifically responds to Items B.2 and C.6 in the enclosure to your letter of May 14, 1980. This submittal will complete the requested PGE responses to the aforementioned NRC letter.

Sincerely,

C. Goodwin, Jr.

C. Goodwin, Jr.
Assistant Vice President
Thermal Plant Operation and
Maintenance

CG/KM/sa/4mg1.1A5
Attachment

c: Mr. Lynn Frank, Director
State of Oregon
Department of Energy

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S 1/1

121 SW Salmon Street Portland, Oregon 97204

ATTACHMENT

Trojan Nuclear Plant
PGE Supplemental Response to the
May 14, 1980 NRC Request on the
Auxiliary Feedwater System

8. Additional Short-Term Recommendations.

2. NRC Position

The licensee indicates that the AFW pump/driver vendor strongly discourages performance of an endurance test. It is our position that you perform an endurance test for each AFW pump prior to startup of Cycle 3 in accordance with the attached revised Additional Short-Term Recommendation No. 2. Note that the test requirement has been reduced from 72 hr. to 48 hr. The licensee should commit to follow the provisions of the revised AFW pump endurance test requirements and submit the requested test information.

PGE Response

As we indicated in the July 1, 1980 PGE letter, the 48-hr. endurance tests had been conducted, prior to startup of Cycle 3, on turbine-driven and diesel-driven Auxiliary Feedwater (AFW) pumps in accordance with the testing conditions specified in the enclosure to the May 14, 1980 NRC letter. The tests were run in the AFW recirculation line at rated pump speed of 4560 RPM with a reduced flow of 80 gpm and a discharge pressure of approximately 1750 psig for the turbine-driven pump and approximately 1580 psig for the diesel-driven pump. After the 48-hr. test run, the pumps were secured for longer than 8 hr. and allowed to cool down to within 20°F of their start-up temperatures. The pumps were then restarted and kept running for an additional 1 hr.

Figure 1 provides the flow schematic diagram for the test. The AFW pump/driver bearing temperatures measured by thermocouples were recorded on strip chart recorders and the plots of the results are presented in the attached Figures 2 and 3. At each bearing, the vibration data were taken at horizontal, vertical and axial directions. Figures 4 and 5 (attachments) provide ambient temperature and humidity data in the pump rooms which were also measured during the tests.

The test results indicated that the pumps remained within design limits with respect to pump/driver bearing temperature and vibration and that no excess vibration was observed during the tests. Furthermore, the pump room ambient conditions (temperature and humidity) did not exceed environmental qualification limits for safety-related equipment in the room.

C. Long-Term Recommendations.

6. NRC Position - AFW System Pipe Break

A licensee's response to this recommendation is not acceptable. It is our position that adequate protection be provided for the diesel-driven AFW pump for postulated rupture of the turbine-driven AFW pump discharge piping in the diesel-driven pump room. In addition, the licensee should ensure that the new motor-driven AFW pump train is separate from existing AFW pump trains in order to ensure that a break in the AFW System (not associated with the motor-driven pump train) could not affect the motor-driven pump. In lieu of the above, the licensee can describe the means for achieving a safe shutdown condition by use other available systems following such a postulated event.

PGE Response

As stated in the Trojan Nuclear Plant FSAR Section 6.6.1, the design basis for the AFW System is to provide feedwater to the steam generators during emergency conditions concurrent with a single active failure. The AFW pump discharge piping was analyzed and reported in PGE-1004, Revision 3, "Analyses of Pipe System Breaks Outside Containment", in response to the NRC letter of December 19, 1972 and subsequent correspondences. It is still our belief, as indicated in our December 31, 1979 letter, that an addition of the nonsafety-grade motor-driven pump is intended to minimize the need for usage of the safety-grade pumps during Plant startup or shutdown, thereby minimizing the already low usage factor associated with these pumps.

In accordance with the NRC concerns raised in the NRC letters of October 3, 1979 and May 14, 1980, however, designs are being developed to provide appropriate protection to the diesel-driven AFW pump from the postulated rupture of the turbine-driven AFW pump discharge line. It is our intent to provide a guard pipe encasing the turbine-driven pump discharge pipe which passes through the diesel-driven pump room. In addition to providing a guard pipe, we are developing a design to connect the motor-driven AFW pump discharge to both turbine-driven and diesel-driven pump discharge pipes with appropriate isolation capability by check valves and failed closed gate valves. It is currently anticipated that these modifications, due to a long equipment lead time, will not be completed until the resumption of power operation (Mode 1) for Cycle 4 in 1981.

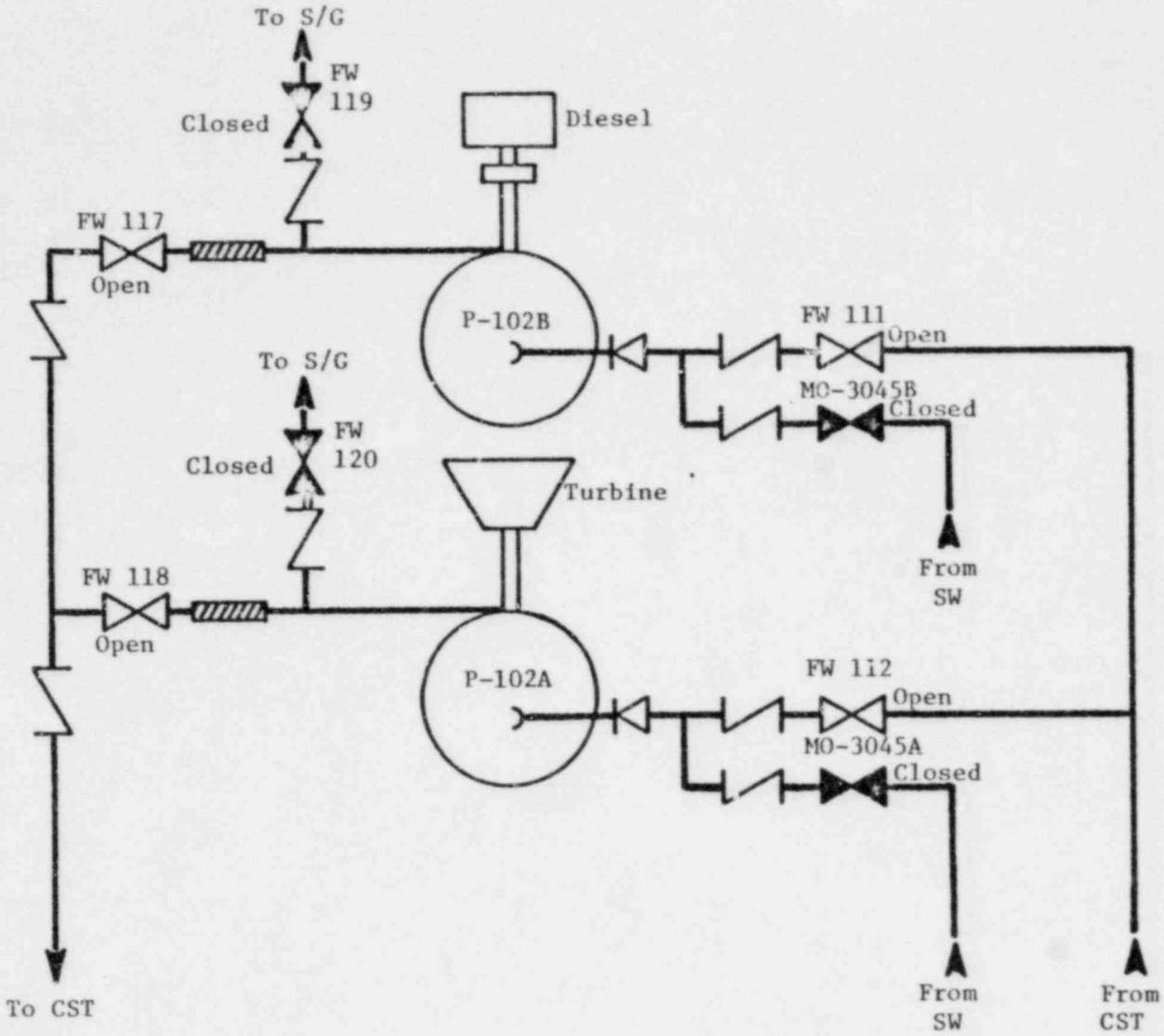


Figure 1 Trojan Nuclear Plant
AFW Pump 48-Hour Endurance Test
Flow Schematic Diagram

Figure 2 Trojan Nuclear Plant
Diesel-Driven AFW Pump Bearing Temperature

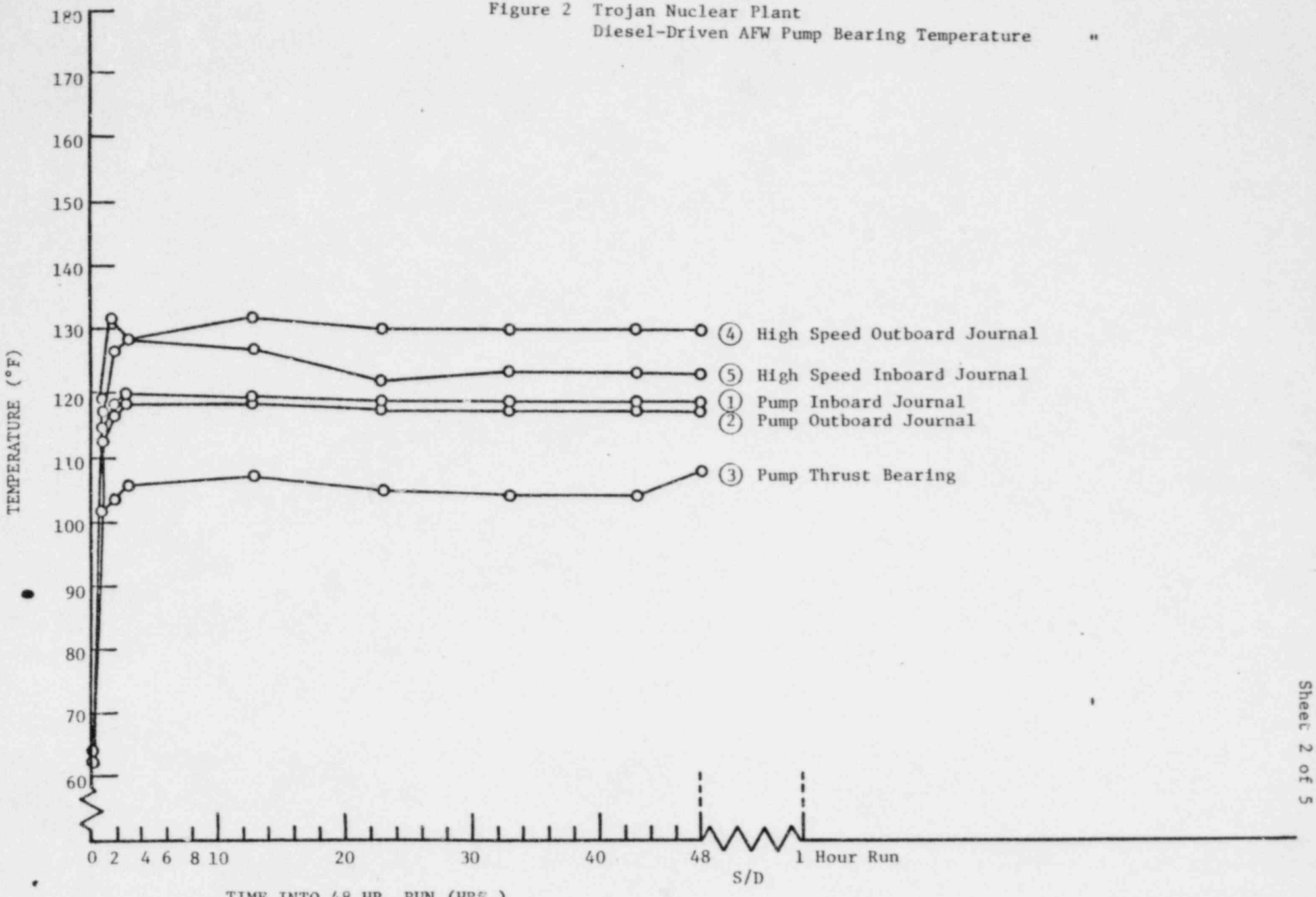
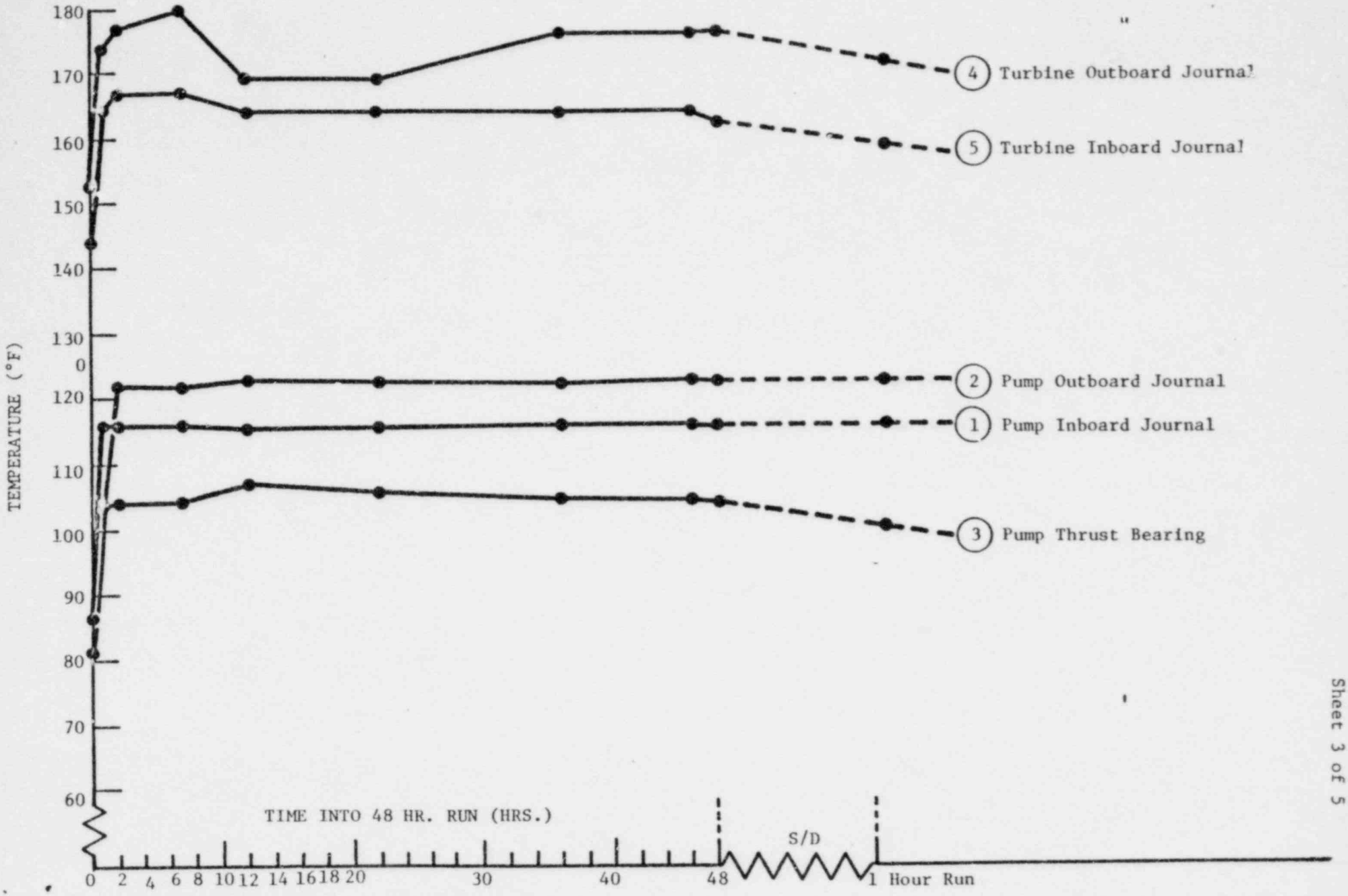


Figure 3 Trojan Nuclear Plant
Turbine-Driven AFW Pump Bearing Temperature



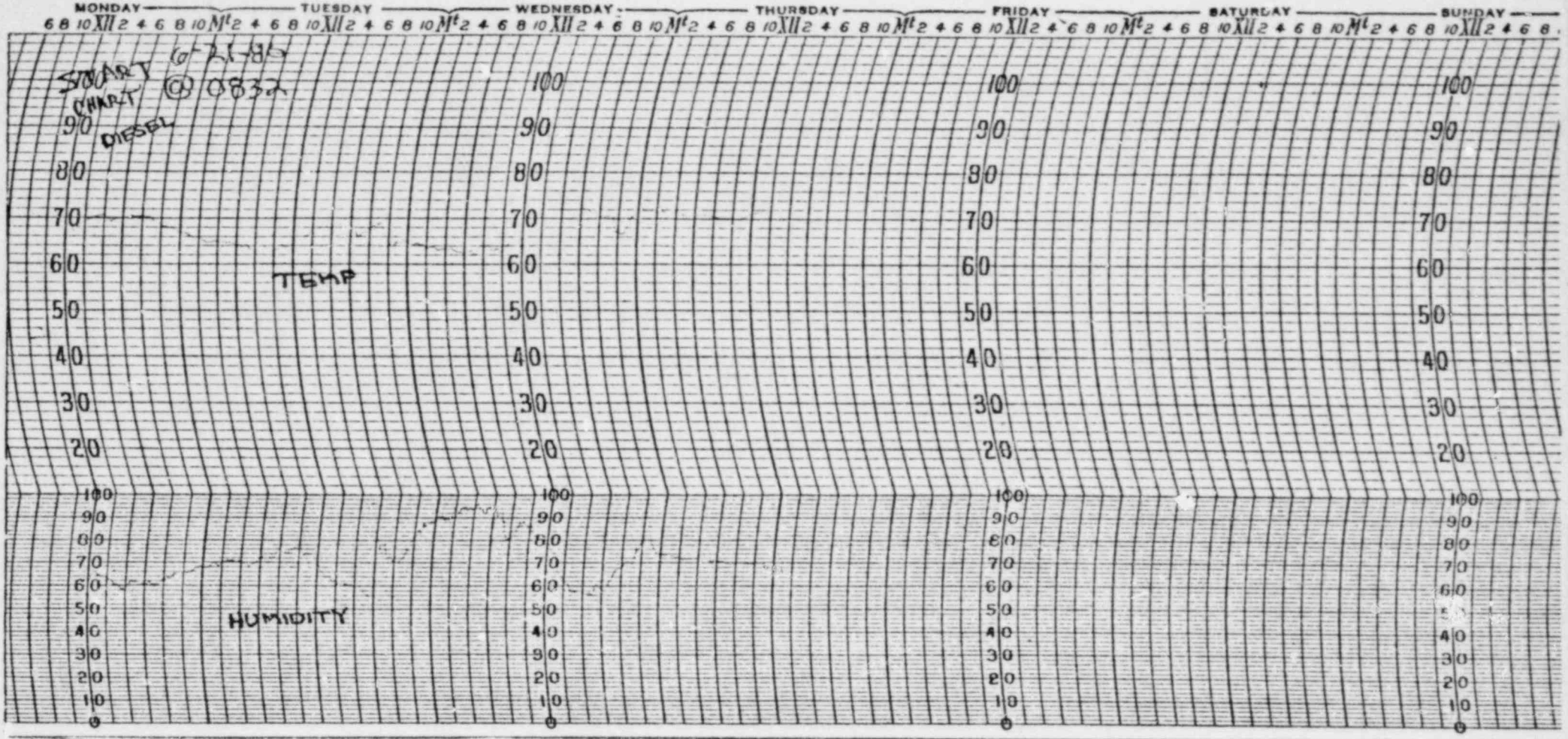


Figure 4 Trojan Nuclear Plant
Diesel-Driven AFW Pump Room
Ambient Temperature and Humidity