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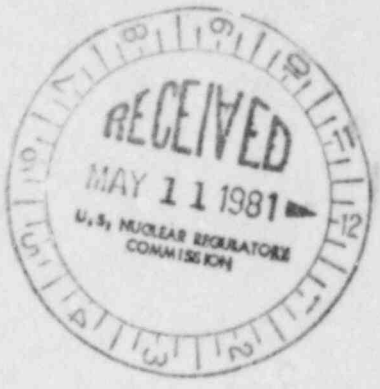
SACRAMENTO MUNICIPAL UTILITY DISTRICT ☐ 6201 S Street, Box 15830, Sacramento, California 95813; (916) 452-3211

May 5, 1981



R. H. ENGELKEN, DIRECTOR
REGION V OFFICE OF INSPECTION & ENFORCEMENT
U. S. NUCLEAR REGULATORY COMMISSION
1990 NORTH CALIFORNIA BOULEVARD
WALNUT CREEK PLAZA, SUITE 202
WALNUT CREEK CA 94596

OPERATING LICENSE DPR-54
DOCKET NO. 50-312
FOLLOWUP REPORT, REPORTABLE OCCURRENCE NO. 81-16

The Sacramento Municipal Utility District reported degraded lube oil cooling capacity on both high pressure injection pumps, P-238 A/B, and the makeup pump, P-236, via LER 81-16 on March 30, 1981. The cause was attributed to excessive corrosion of the lube oil cooler heads resulting in 80 - 90% of the tubes being plugged by corrosion products. A sample analysis indicated mostly iron (93%) Silicon (4%) and Copper (1%).

At that time, preliminary calculations of the lube oil cooling requirements were performed. These calculations assumed the worst case cooler having 90% of the tubes plugged. The results indicated that the pumps, although having degraded lube oil capacity, were in fact still operable.

To verify the calculations and fully assess the effects of the degraded condition of the lube oil coolers via operational data, the District committed to performing a special test. This test involved running the makeup pump, P-236, with the lube oil coolers inlet valves closed, thereby simulating 100% of the tubes being plugged. The purpose being to determine the operating duration of a high pressure injection pump without any lube oil cooling.

The pump was started and run for two hours and two minutes. Temperature data collected during the performance of the test indicated bearing temperature rises from a maximum 55°F/minute immediately after the pump start, to an average rate of 0.25°F/minute just prior to terminating the test. All bearing temperatures were approaching constant, time-independent values (i.e., stabalizing) at the conclusion of the test.

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Oil temperature differential accross the blocked oil cooler increased 6°F during the two hour run. A steady decrease in lube oil pressure was noted during the first 17 minutes of the test. After the auxiliary lube oil pump started, only a gradual drop in pressure (i.e., one psig over one hour and 44 minutes) was noted. The 11.5 psig pressure noted at the conclusion of the test is well above the three psig minimum recommended by the manufacturer.

In conclusion, without any lube oil cooling, extended operation of a high pressure injection pump would result with pump and motor end center gear bearing temperatures stabilizing at levels slightly higher than 200°F--but not at values detrimental to continued operation. The remaining bearing temperatures would remain less than the 200°F value.

The effect of these temperatures upon oil viscosity and pressure would be negligible, enabling operation to continue for an extended period of time. These test results substantiate the earlier determination that, although the lube oil cooling capability was significantly degraded, the pumps themselves were fully operable.

Wm. C. Walbridge
General Manager

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