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LOFT VITAL MG SET TRANSIENT PARAMETER REVIEW

A. N. Kranning

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AUTHOR A. N. Kranning <i>AKranning</i>		GWA NO. 52182-700-001
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ABSTRACT

This report evaluates the performance of the vital MG sets during a worst case load transfer. Evaluation of test data showed:

1. The Vital MG Set withstood the extreme loading
2. The load can be sustained well in excess of the required time limit
3. The transfer perturbation caused the frequency to exceed the limits set by the SDD.

The follow up evaluations of the equipment powered by the MG sets demonstrated that the equipment function will not be degraded.

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INTRODUCTION

LOFT Technical Report 1310-13 predicts the loads expected during a worst case (Loss of Commercial Power Coincident with a LOCE) load transfer. Load transfer tests were run (SO 68.2 Attachment 6 and 7) to verify that the Vital MG sets can sustain the predicted 290 kW load for the required 1 hr. This hour is sufficient time to start the diesel generator to support the vital power system loads until commercial power can be restored.

TRANSFER TEST RESULTS

The tests showed:

1. The load can be transferred and maintained for the required time without adverse effect on the end devices receiving the electrical power.
2. The frequency varied from 55 Hz to 63 Hz, SDD 1.3.10 sets the limits at ± 3 Hz.

PROBLEM STUDY AND DISCUSSION

Due to the frequency limits being exceeded during the tests a Quality Deficiency Report (TM-2291) was written.

The LOFT Technical Support Division evaluated this SO test data along with data taken at the time of equipment installation and initial load testing.

The data taken at installation showed the same frequency condition to exist. When the MG set is suddenly loaded in excess of approximately 240 kW the frequency variations exceed the limits specified in SDD 1.3.10. The factory representative set the MG set controller for minimum voltage and frequency variation vs. minimum time of oscillation (optimum operation) during the installation and checkout.

LOFT Technical Support Division evaluated the reactor safety and control systems and found:

1. The reactor shutdown instrumentation required to function for this transient will not be adversely affected by ± 10 Hz variation in frequency. During a LOCE the Scram is initiated by the HOT LEG low pressure which has a response time of 125 MS. This PPS logic is powered by:

	<u>Power Supply</u>	<u>Frequency Range</u>
A.	± 15 volt supply	50-1000 Hz
B.	± 24 volt supply	47-420 Hz
C.	35 VDC supply	Unregulated

A reduction in frequency in the 34 VDC supply may reduce the current in the Loop slightly but this will cause the channel to trip even more quickly.

2. The containment isolation valves will be unaffected because the power sources are removed and the valves close isolating the containment vessel.
3. The LPIS pump, HPIS pump, Fire pump FP-P-21C, demineralized water pump DW-P-9 and the RABV valve CV-P138-70 expected to start during the worst case load will not be adversely affected. (1)

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