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Docket No. 50-346

April 19, 1976

Dr. Ernst Volgenau, Director
Office of Inspection and Enforcement
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Dr. Volgenau:

This letter is submitted in accordance with 10 CFR Part 50.55 regarding the apparent deficiency of the Safety Features Actuation System (SFAS) as previously discussed with Mr. C. C. Williams on March 19, 1976 and Mr. R. C. Martin, on April 13, 1976, both of Region III.

Report on SFAS Analog Amplifier and Bistable Grounding Deficiency

This report is being made pursuant to 10 CFR Part 50.55(e) on Significant Deficiencies, and documents the evaluation of the possible significant deficiency in the method of grounding the Analog Amplifiers and Bistables in the SFAS.

Identification of Problem

The Davis-Besse Nuclear Power Station Unit 1 SFAS was purchased from the Consolidated Controls Corporation (CCC). This system has 16 Analog Amplifiers that are used to condition the input signals for use with the trip bistables installed in the system. Each of these Analog Amplifers supply a low voltage signal (approximately 0.25 to 7.25 volts) to six trip bistables. The CCC drawings showing the connections from the Analog Amplifier output to the input of the trip bistables did not show in detail the method that CCC was using for the grounding and ground connections for this portion of their system.

Analysis

The trip bistables for this system were bench tested and calibrated on site using the detailed instructions in the CCC Instruction Manual. After the modules were inserted into the SFAS cabinetry, it was detected during system check out that the trip points did not correspond with their original settings.

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Upon investigation it was determined that there was a voltage difference between the common point on the analog output of the Analog Amplifier and the common point on the analog input to the trip bistable. This voltage difference was caused by an external current flowing in the common leads in the common-to-ground connection of the circuitry between the trip bistables and the Analog Amplifiers due to the "chaining" of the grounds between modules.

This problem is considered to be a significant deficiency as defined by 10 CFR Part 50.55(e), because (1) there was a significant deficiency in the design details in that specific grounding requirements were not adequately identified, and (2) it cannot be shown that the bistables would have tripped within the tolerances allowed in the FSAR.

Corrective Action

CCC will modify their drawings to show a separate connection between ground and the output of the analog module and a separate ground connection from the common terminal to ground for the input to the trip bistable. No other currents will be allowed to flow in these ground connections. In addition, the CCC drawings will be modified to show the details for all ground and common connections in their cabinetry. Appropriate grounding changes will be made, and system checkout and testing performed to assure trip bistable actuation in accordance with FSAR commitments.

Safety Implications

Based on the above, we conclude that the grounding system used by CCC was inadequately identified on their design drawings. While the trip points would not have been exactly as desired, this condition was determined during the thorough and stringent testing and checkout by the Applicant on site prior to the time the equipment was turned over for operation. Thus, the safety of the station and the public were not jeopardized.

Yours very truly,

Lowell E. Roe

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