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 Document Control Branch (Document Control Desk)

SUBJECT: Advises that util completed testing of CD-4000 series
isolator used in containment hydrogen analyzer panel, as
followup to 920701 response to Reg Guide 1.97, "Accident
Monitoring Instrumentation."

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May 5, 1993

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Gentlemen:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
Regulatory Guide 1.97 Accident Monitoring Instrumentation

- References:
- 1) Letter from C. A. Schrock (WPSC) to Document Control Desk (NRC) dated July 1, 1992
 - 2) Letter from A. G. Hansen (NRC) to C. A. Schrock (WPSC) dated June 9, 1992
 - 3) Letter from C. A. Schrock (WPSC) to Document Control Desk (NRC) dated October 30, 1992
 - 4) Telecon between S. L. Bernhoft (WPSC) and A. G. Hansen (NRC) dated February 16, 1993

Reference 1 notified the Nuclear Regulatory Commission (NRC) of Wisconsin Public Service Corporation's (WPSC) commitments to the recommendations of NRC Regulatory Guide (RG) 1.97, Revision 3, with exceptions and deviations as described therein. Reference 2 provided WPSC with the results of the NRC RG 1.97 inspection performed the week of February 24-28, 1992, at the Kewaunee Nuclear Power Plant (KNPP). Based on discussions between WPSC and NRC staff during the inspection period, WPSC committed to provide test results for the CD-4000 isolator used in the containment hydrogen analyzer panel by October 31, 1992. References 3 and 4 provided the NRC with an updated schedule for retesting the isolator in question. As mentioned in reference 3, equipment problems were the cause of the extension; however, in reference 4, it was explained to the NRC that the manufacturer agreed to perform additional testing and that obtaining the necessary test data, due to the long lead time, was the cause of the extension.

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This letter is to notify the NRC that WPSC, in cooperation with another utility, has completed testing of the CD-4000 series isolator used in the containment hydrogen analyzer panel. This test entailed the application of maximum credible AC and DC fault voltage to the output side of the isolator to determine the effects on the input side as required by IEEE 384-1981, "IEEE Standard Criteria for Independence of Class 1E Equipment and Circuits". However, voltage spikes for all of the voltage tests cascaded back to the input side of the isolator. The largest spike was incurred during the direct current-reverse polarity test. This spike had a magnitude of approximately 100 volts and was very short in duration (approximately 0.5 milliseconds). After this spike, the original input signal was unaffected and no other anomalies existed.

To evaluate the identified anomaly, WPSC contacted the hydrogen monitor manufacturer, Comsip (now CEGELEC Automation Inc.), to determine the impact of these voltage spikes on the upstream circuitry. Having reviewed this test data, CEGELEC raised questions as to the appropriate isolation of the 120 VAC power supply to the isolator. It is CEGELEC's professional opinion that if the power supply to the isolator was not correctly isolated, this condition could cause additional feedback to the input due to a fault on the output.

CEGELEC Automation Inc. performed additional testing on the isolator to evaluate this anomaly. However, this time the test was performed in a fully functional trainer unit, which resulted in the isolator being installed in a configuration more representative of the actual configuration as installed in the plant.

CEGELEC's test consisted of maximum credible fault voltages (+152 VDC, -152 VDC, and 132 VAC) applied to the 4-20 mA DC output (non-1E side) of the CD-4000 module while monitoring the 0-1 VDC input (1E side) for voltage spikes. These fault voltages resulted in no voltage spike greater than 5.0 V measured on the 1E input side of the device. According to CEGELEC, these fault voltages will have no affect on the analyzer electronics in the CEGELEC Automation Inc. K-III containment analyzer system. These test results are on file and are available upon request.

In summary, CEGELEC Automation Inc. dispositioned the previous anomaly identified in the utilities test by performing additional testing that ensures that the CD-4000 series isolator is indeed a qualified isolation device and ensures that the upstream circuitry is unaffected by a downstream fault. Therefore, this satisfies WPSC's commitment to ensure that this loop meets WPSC's definition for a RG 1.97 category 1 variable.

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If you have any further questions regarding this issue, please feel free to contact me or a member of my staff.

Sincerely,

C. A. Schrock

C. A. Schrock

Manager - Nuclear Engineering

DJW/cjt

cc - US NRC Region III
US NRC Senior Resident Inspector

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