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10CFR21.21

Docket No. 50-461

Document Control Desk
Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: 10CFR21 Defect 21-94-012: Incorrect Size Telephone
Coil Current Limiting Resistor in Westinghouse/
Asea Brown Boveri CV-2 Voltage Relay

Dear Sir:

On June 7, 1994, during a routine tour of plant equipment at Clinton Power Station (CPS), an operator observed relay targets showing in the CV-2 relay of the Division 1 emergency diesel generator (EDG) output breaker to the 4160-volt bus, indicating a circuit malfunction. The EDG was in the standby mode at the time the targets were observed. An investigation of this issue determined that the CV-2 relay telephone coil had failed due to excessive current as a result of an incorrectly sized current limiting resistor in the telephone coil circuitry.

On June 10, 1994, Illinois Power (IP) determined that the failure of the CV-2 relay was a condition potentially reportable under the provisions of 10CFR21.

Based on an evaluation of this matter, IP concluded that the CV-2 relay constitutes a defect. IP provides the following information in accordance with the requirements of 10CFR21.21(c)(4). Initial notification of this matter will be provided by facsimile of this letter to the NRC Operations Center in accordance with 10CFR21.21(c)(3) on the date this letter is signed by the responsible officer.

- (i) J. G. Cook, Vice President of Illinois Power, Clinton Power Station, Post Office Box 678, Clinton, Illinois, 61727, is informing the Nuclear Regulatory Commission of a 10CFR, Part 21 defect by means of this report.
- (ii) The basic component involved in this reportable defect is a voltage relay, model number CV-2, style number 1454C77A01. In the EDG application, the relay provides a permissive signal to close the EDG output breaker after the EDG

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is producing proper voltage. In this application, the relay CV contacts are normally closed since the EDG is normally in the standby mode, and the output is therefore below the specified voltage setpoint. Thus, the relay's telephone coil is normally energized.

- (iii) The CV-2 relay was manufactured by Westinghouse/Asea Brown Boveri (ABB) and supplied to CPS by ABB. The application of the CV-2 relay was designed by Sargent & Lundy.
- (iv) The defect is that the telephone coil current limiting resistor has a lower resistance value than the value implied in the manufacturer's literature. The CV-2 relay telephone coil failed due to excessive current over a period of about two years. The manufacturer's literature implies that the resistor is 2500 ohms, whereas a 1320-ohm resistor was installed in the telephone coil that failed at CPS. Discussions with the manufacturer identified that the resistor design was changed in May 1982 to the smaller size; however, Illinois Power was not aware of the change.

Since the telephone coil prevents EDG output breaker closure when EDG voltage output is less than EDG rated voltage, failure of the telephone coil during a loss of offsite power (LOOP) or LOOP/loss of coolant accident would allow the output breaker to close before the EDG reaches rated voltage. Premature closure of the breaker could cause the EDG to stall, making it incapable of providing proper voltage to safety loads, thus preventing completion of the EDG function.

- (v) The incorrectly sized telephone coil current limiting resistor was discovered on about June 8, 1994. IP determined on June 10, 1994, that the condition was potentially reportable under the provisions of 10CFR21.
- (vi) The Divisions 1 and 2 EDGs each have two CV-2 relays installed in the same applications, all of which are believed to have the incorrectly sized resistor. CPS has other CV-2 relays, used in different applications, which do not appear to be affected by this defect because their telephone coils are normally in a deenergized state.

IP suspects that a failure of the other Division 1 EDG CV-2 relay in August 1993 was a result of an incorrectly sized telephone coil current limiting resistor; however, that relay is not available for investigation.

IP has no information about potentially defective relays supplied to other purchasers.


- (vii) The Division 1 EDG CV-2 relay that failed has been replaced with another CV-2 relay of the same design.

IP is developing a design change to replace the 1320-ohm resistor with a resistor properly sized for the EDG application. In the interim, the currently installed EDG CV-2 relays are considered acceptable because they have seen less than two years of service and are currently operable. The Division 2 EDG CV-2 relays were replaced in May 1994, and the other Division 1 EDG CV-2 relay was replaced in August 1993.

- (viii) IP recommends that other purchasers of this model relay review their applications to ensure a properly sized resistor is installed for the application. Additional information about this defect may be obtained by contacting D. G. Lukach, System Engineer, at (217) 935-8881, extension 3952.

Documentation related to this defect is available for your review at our offices.

Sincerely yours,


J. G. Cook
Vice President

RSF/csm

cc: NRC Clinton Licensing Project Manager
NRC Resident Office, V-690
Regional Administrator, Region III, USNRC
Director, Office of Nuclear Reactor Regulation
INPO Records Center
Illinois Department of Nuclear Safety
Westinghouse/Asea Brown Boveri
Sargent & Lundy