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U-602677

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Docket No. 50-461

10CFR21.21

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

Subject: 10CFR21 Final Report 21-96-025: Failure of Westinghouse DHP
Breaker to Close Due to Dirty and Binding Motor Cut-Off Switch
and Spring Charge Indicator Mechanism

Dear Madame or Sir:

On October 27, 1996, Illinois Power (IP) identified the failure of a Westinghouse DHP circuit breaker to close on demand during a surveillance test as a potentially reportable condition under the provisions of 10CFR, Part 21. The affected breaker is the Division 1 Reserve Auxiliary Transformer (RAT) main feed breaker. The breaker is required to close to supply the Division 1 4160-volt safety-related bus. Failure of the breaker to close on demand during a Loss of Coolant Accident (LOCA) could prevent safety-related equipment from performing its intended function.

An investigation identified that the cause of the failure to close was a dirty and binding motor cut-off switch and spring charge indicator mechanism. The vendor literature provided for the breaker did not include guidance for inspecting, cleaning, adjusting, or lubricating the motor cut-off switch and spring charge indicator mechanism. Westinghouse has indicated that another purchaser experienced a similar deficiency.

At IP's request, Westinghouse provided instructions for inspecting, cleaning, adjusting, and lubricating the motor cut-off switch and spring charge indicator mechanism.

IP has evaluated this issue and concludes that it is reportable under the provisions of 10CFR, Part 21.

IP is providing the following information in accordance with 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) within two days of the date the responsible officer signs this letter.

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- (i) Wilfred Connell, Vice President of IP, Clinton Power Station, Post Office Box 678, Clinton, Illinois, 61727, is the responsible officer notifying the Nuclear Regulatory Commission of a condition reportable under the provisions of 10CFR, Part 21.
- (ii) The basic component involved in this condition is a model 50DHP350, 1200-amp, 4160-volt circuit breaker. The breaker is the Division 1 RAT main feed breaker and is required to close to the supply the Division 1 4160-volt safety-related bus.

The motor cut-off switch and spring charge indicator mechanism is used in the spring charge motor and spring coil (closing coil) circuitry of both DHP and DVP type breakers. Therefore, all type DHP and DVP breakers could be susceptible to the failure mechanism described in this report.

- (iii) The DHP and DVP circuit breakers are manufactured and supplied by Westinghouse.
- (iv) The breaker failed to close on demand during surveillance testing due to a dirty and binding motor cut-off switch and spring charge indicator mechanism. The dirty and binding condition of the mechanism was a result of not performing periodic maintenance to inspect, clean, adjust, and lubricate this mechanism. A periodic maintenance activity was not scheduled because the vendor's maintenance literature did not indicate that periodic maintenance was necessary for continuous proper operation of the motor cut-off switch and spring charge indicator mechanism.

The principle function of the motor cut-off switch and spring charge indicator mechanism is to shut off the spring charging motor after the springs are charged, and to provide a close permissive to the closing coil. Linkage in the mechanism rides on a cam that follows breaker spring operation. The mechanism's linkage was found to be dirty and binding, and that condition prevented the linkage from operating properly. As a result, the cut-off switch (limit switch) did not allow the close signal to get to the close coil.

Failure of the breaker to complete its safety function and close on demand during a LOCA could prevent safety-related equipment from performing its intended function.

- (v) The failure of the circuit breaker to close on demand during surveillance testing was identified and determined to be a potentially reportable condition under the provisions of 10CFR, Part 21, on October 27, 1996.
- (vi) Clinton Power Station (CPS) has twenty-one other DHP type and four DVP type breakers in installed and spare locations of various safety-related circuits. None of these breakers are known to have had previous failures similar to the Division 1 RAT main feed breaker.

Westinghouse has indicated that another purchaser experienced a similar deficiency.

- (vii) After IP notified Westinghouse about the dirty and binding motor cut-off switch and spring charge indicator mechanism, Westinghouse provided instructions to IP for inspecting, cleaning, adjusting, and lubricating the mechanism.

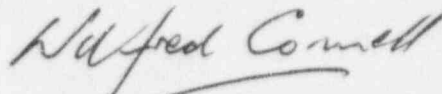
IP inspected, cleaned, adjusted, and lubricated the motor cut-off switch and spring charge indicator mechanism in the breaker that failed to close. IP retested the breaker with satisfactory results and restored it to service.

IP has incorporated instructions for maintaining the motor cut-off switch and spring charge indicator mechanism into maintenance procedures, and will incorporate that information into applicable vendor manuals.

- (viii) IP advises other purchasers or licensees to contact Westinghouse to obtain information about maintenance of the mechanism. Additionally, per discussion with Westinghouse personnel, a technical bulletin will likely be issued to inform customers about this potential problem.

Additional information about this issue may be obtained by contacting D. G. Lukach, system engineer, at (217) 935-8881, extension 3952.

Sincerely yours,



Wilfred Connell
Vice President

WC/krk

cc: NRC Clinton Licensing Project Manager
NRC Resident Office, V-690
Regional Administrator, Region III, USNRC
Illinois Department of Nuclear Safety
INPO Records Center
Westinghouse