Westinghouse Electric Corporation Energy Systems

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June 24, 1991
NS-NRC-91-3604

Document Control Desk
US Nuclear Regulatory Commission
Washington, DC 20555

Attention: Dr. Thomas E. Murley, Director
Office of Nuclear Reactor Regulation

Dear Dr. Murley:

The following information is provided pursuant to the requirements of 10 CFR Part 21 to report the potential for the existence of a substantial safety hazard as communicated by Ms. P. A. Loftus of Westinghouse to Mr. C. E. Rossi of the Nuclear Regulatory Commission by telephone on June 20, 1991. This issue concerns the lack of explicit test information for the detection of a postulated shorted diode in the Solid State Protection System (SSPS) test circuit. This issue applies to all plants supplied by Westinghouse with the SSPS.

BACKGROUND

Westinghouse provides blocking diodes on the Safeguards Output Cards in the SSPS master/slave relay test circuits for the safety injection function. During periodic surveillance testing of the master relay for the safety injection function, this diode prevents energization of other master relays which are in parallel with the safety injection master relays. Shorting of this diode would disable the function of this diode (only during testing) resulting in energization of multiple master/slave relays during the safety injection master/slave relay test. Energization of multiple master/slave relay circuits could result in ambiguous test information if certain master relay contacts were to be failed and the Output Relay Test Panel continuity lamps are used as the sole verification for the master/slave relay circuit associated with the safety injection function.

The diode shorting issue was identified in April 1991 by Westinghouse while performing an analysis of an unrelated issue for a nuclear utility customer.

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EVALUATION

Even though shorting of the diode under discussion is a postulated failure, Westinghouse is aware of no documented record of any failure of the diode in this application. A shorted diode will not prevent automatic or manual actuation of safety injection. In addition, the test circuit configuration for the safety injection master/slave relay circuit is the only test circuit with this configuration in the SSPS.

The SSPS Technical Manual provides step by step procedures for testing of each master/slave relay safety-related function. For each "Slave Relay Function" to be tested, the SSPS Technical Manual specifies the "Master Relay Selector" switch position, the "Master Relay Selected" to be tested, and which combination of slave relay "Continuity Lamps" are to be illuminated. While the Technical Manual is very explicit about the selection of the master relay(s) to be tested and the combination of slave relay continuity lamps that should be illuminated, it does not specifically require the operator to verify that the selected master relay(s) and only the selected master relay(s) change state during testing.

SAFETY IMPACT

A table in the SSPS Technical Manual provides information in regards to which specific master relay(s) should change state during testing of any specific function. However, failure to verify that only the master relay(s) selected for test do change state could result in ambiguous test information. If the diode under discussion were shorted and the SSPS Output Relay Test Panel continuity lamps were used as the sole verification for the safety injection master/slave relay circuit, then a failure in the safety injection function may not be detectable during the periodic surveillance test.

RECOMMENDED CORRECTIVE ACTION

Westinghouse will provide the following supplemental test instructions to all utility customers with a Westinghouse supplied SSPS. A list of all plants with the SSPS is attached.

> During the periodic surveillance testing of the SSPS, verify that only the safety injection master relays (typically K501 and K521) change state when selected for testing. Adjacent master relays (typically K502, K503, and K522) should not change state. A change in state of these adjacent master relays is an indication that the diode under discussion is shorted and must be replaced before continuation of the test.

This requirement should be incorporated into the plant periodic surveillance test procedure for the master relay associated with the safety injection function consistent with the time frame for plant documentation changes.

If you have any questions regarding this matter, please contact Mr. P. J. Morris of my staff at (412) 374-5761, or myself.

Sincerely,

S. L. Tritch

S. R. Tritch, Manager
Nuclear Safety Deparatment

NS-NRC-91-3604-6/24/91

ATTACHMENT TO NS-NRC-91-3604

Domestic Westinghouse plants supplied with SSPS:

Farley 1 & 2
Byron 1 & 2
Braidwood 1 & 2
McGuire 1 & 2
Catawba 1 & 2
Beaver Valley 1 & 2
D. C. Cook 1 & 2
Shearon Harris
Vogtle 1 & 2
Millstone 3
Seabrook
Diablo Canyon 1 & 2
Trojan
Salem 1 & 2
V. C. Summer
Sequoyah 1 & 2
Watts Bar 1 & 2
North Anna 1 & 2
Wolf Creek
Callaway
South Texas 1 & 2
Comanche Peak 1 & 2