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UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

MAR 16 1976

Iowa Electric Light and Power Company
ATTN: Mr. Duane Arnold, President
Security Building
P. O. Box 351
Cedar Rapids, Iowa 52405

Docket No. 50-331

Gentlemen:

The enclosed Bulletins No. 76-02 and No. 76-03 are forwarded to you as a matter concerning a possible generic problem relating to reactor safety systems and components.

Any questions regarding this bulletin should be directed to this office.

Sincerely,

James G. Keppler
Regional Director

Enclosures:
1. IEB 76-02, 3/16/76
2. IEB 76-03, 3/16/76

cc w/encl:
G. G. Hunt
Chief Engineer

bcc w/encl:
Central Files
IE Files
PDR
Local PDR
OGC, Beth, P-506A

March 16, 1976
IE Bulletin No. 76-02

RELAY COIL FAILURES - GE TYPE HFA, HGA, HKA, HMA RELAYS

DESCRIPTION OF CIRCUMSTANCES:

A failure of a General Electric (GE) model 12 HFA 51A42H Relay occurred recently in a safety related circuit at the Turkey Point facility. The relay failed during reactor safeguards systems testing. Earlier failures of a similar nature involving GE type HGA relays were reported from Florida Power and Light Company in 1973.

The relay manufacturer has determined that open circuit coil failures of the relay windings had been caused by corrosion. Halogens from a class of nylon coil spools (or bobbins) plus humid conditions were attributed as the fundamental causes of the corrosion and resulting coil failure.

The relays identified by the manufacturer which may have this nylon spool include HFA, HGA, HKA, HMA relay types, made by GE prior to 1969, and they may be identified by a white, nylon coil spool. Portions of a GE service letter containing information about these relays are attached to this bulletin. Further instructions regarding repair procedures can be obtained from the GE Service Engineering Department, Philadelphia.

ACTION TO BE TAKEN BY LICENSEES AND PERMIT HOLDERS:

For all power reactor facilities with an operating license or construction permit:

1. If you have received the attached GE service letter, describe what action you have taken regarding replacement of the older style nylon coil bobbins with the recommended Lexan type bobbins in the types of relays identified in the enclosed GE letter.

2. If you have not received the attached GE service letter, describe what action you plan to take if relays of the type and vintage described in the enclosed GE letter are in use or planned for use in safety related systems.

Reports for facilities with operating licenses should be submitted within 30 days after receipt of this bulletin, and reports for facilities with construction permits should be submitted within 60 days after receipt of this bulletin. Your report should also include the date when the above actions were or will be completed.

Reports should be submitted to the Director of the NRC Regional Office and a copy should be forwarded to the NRC Office of Inspection and Enforcement, Division of Reactor Inspection Programs, Washington, D. C. 20555.

Approval of NRC requirements for reports concerning possible generic problems has been obtained under 44 U.S.C. 3152 from the U. S. General Accounting Office.
(GAO Approval B-180255(R0072), expires 7/31/77)

ATTACHMENT:
Extract from General Electric Service Letter:
HFA, HGA, HKA, HMA RELAYS
NYLON COIL BOBBINS

Extract From General Electric Service Letter

HFA, HGA, HKA, HMA RELAYS
NYLON COIL BOBBINS

In 1954, a program was initiated to improve the mechanical and electrical properties of paper based spools used for HFA, HGA, HKA and HMA relay coils. Heat stabilized nylon was selected for the spool material because its temperature characteristics made it well suited for Class A coils, and the material provided the desired improvement in electrical and mechanical properties. Manufacturing of HMA relays with the nylon spools started in 1955. After three years of successful experience, the change to nylon spools was implemented in HFA, HGA, and HKA relays in 1958.

In the mid 60's, a few failures of HMA coils utilizing the nylon spools for DC applications were reported. As a result of these failures, an investigation was undertaken to determine the cause of the failures. It was found from this investigation that the heat stabilizing element of the nylon coil spool contained halogen ions which could be released over a period of time. When combined with moisture, the halogen ions form hydrocloric acid and copper salts which could cause the eventual open circuit failure of the coils.

The most significant contributing factor in the reported failures is high humidity. Other contributing factors are the small wire size used in HMA relays and in DC relays, and the release of halogen ions is accelerated by DC potential. Relay coils which are continuously energized are not subject to this phenomenon because the coil temperature is maintained considerably above ambient, thus minimizing the probability of moisture getting into the coil.

After the spool material was changed to nylon in 1955-58, a new material, Lexan, became available. Lexan has the desired chemical, mechanical and electrical characteristics for use in spools. The change to the use of Lexan for spools was started in 1964 and completed in 1968. The first relay changed was the HMA followed by the HGA and HFA. Black was chosen for the color of Lexan spools to make them distinguishable from the nylon.

Since the initial report of open circuited HMA coils, the failures of auxiliary relays has been very limited. However, recently one customer reported an accumulation of open circuit failures of a significant number of HGA relays with nylon spools which were used in X-Y closing circuits of breakers. As a result of this recent report and in keeping with our procedure of informing you of potential problems, we are bringing this matter to your attention, even though the overall rate of failure continues to be extremely low.

(Paragraph deleted)

If you have applications of HFA, HGA, HKA, and HMA relays in areas of high humidity, intermittent operation, DC power, and with white nylon spools, you may wish to consider replacing the coils or relays.

(Paragraph deleted)

March 16, 1976
IE Bulletin No. 76-03

RELAY MALFUNCTIONS - GE TYPE STD RELAYS

DESCRIPTION OF CIRCUMSTANCES:

A malfunction of a General Electric (GE) Type 12STD15B5A Relay occurred recently in a safety related load center at Joseph M. Farley Station. The relay malfunction was due to radio frequency interference from an activated transceiver. This malfunction tripped the circuit breakers to isolate the associated transformer which resulted in the removal of the incoming power to the 600 volt load center. Three other users of these devices have reported STD relay malfuntions due to radio frequency interference. In addition, there have been several cases of failed shorted components on the STD relay amplifier card which resulted in relay malfunction. The STD type relay may be installed in similar applications at BWR or PWR facilities. The relays involved were initially marketed in 1968.

Portions of a GE service letter containing information about these relays are attached to this bulletin. Further instructions regarding repair procedures can be obtained from the GE Service Engineering Department, Philadelphia.

ACTION TO BE TAKEN BY LICENSEE AND PERMIT HOLDERS:

For all power reactor facilities with an operating license or construction permit:

1. If you have received the attached GE service letter, describe what action you have taken regarding the recommended action to update your existing STD relays identified in the enclosed GE letter.

2. If you have not received the attached GE service letter, describe what action you plan to take if relays of the type and model described in the enclosed GE letters are in use or planned for use in safety related systems.

Reports for facilities with operating licenses should be submitted within 30 days after receipt of this bulletin, and reports for facilities with construction permits should be submitted within 60 days after receipt of this bulletin. Your report should also include the date when the above actions were or will be completed.

Reports should be submitted to the Director of the NRC Regional Office and a copy should be forwarded to the NRC Office of Inspection and Enforcement, Division of Reactor Inspection Programs, Washington, D. C. 20555.

Approval of NRC requirements for reports concerning possible generic problems has been obtained under 44 U.S.C. 3152 from the U. S. General Accounting Office.
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ATTACHMENT:
Extract from General Electric Service Letter:
STD RELAYS
TRANSFORMER DIFFERENTIAL RELAY

When the problem was initially reported, insulating tubing was added to the zener diode in our manufacturing process as a future safeguard to prevent possible short circuiting due to deformation of the zener diode leads. Subsequently, to further improve the STD relay, the sense amplifier card has been redesigned using a new printed circuit card with components arranged to preclude any possibility of short circuiting.

At the same time the card had been redesigned to improve the card layout, the STD dropout time was reduced to 32 milliseconds and its radio frequency sensitivity was reduced significantly. Thus, an updated relay will pass the RFI and Fast Transient tests, and, of course, the standard IEEE Surge Withstand Capability test. In addition, a change in nameplate design makes the output contacts more visible.*

The new sense amplifier card is identified as #0108B9305 G-4. This new card will become a standard feature in all STD relays shipped after December 1, 1975. At that time the STD model numbers will be changed in accordance with the attached list to reflect these changes, and the new relay models will be automatically substituted on unfilled orders.

Existing STD relays now in service can be updated with a new amplifier card, associated dropping resistors and minor wiring changes.

*None of these design improvements affect the basic operating principles of the STD (operate on fundamental, restrain on all harmonics) nor do they change the restraint level from 20% harmonics. These principles have been proven effective on over 35,000 G.E. harmonic restraint transformer differential relays, including those applied to transformers with the new high permeability core steel. A reduction in the level of harmonic restraint is not desirable, as it would degrade performance (desensitize the relay in detecting faults during energizing) with no offsetting benefit.

OLD MODEL NUMBER	NEW MODEL NUMBER	KIT NUMBER
12STD15B1A	12STD15C3A	0152C9069 G1
12STD15B2A	12STD15C2A	0152C9069 G2
12STD15B3A	12STD15C3A	0152C9069 G3
12STD15B4A	12STD15C4A	0152C9069 G4
12STD15B5A	12STD15C5A	0152C9069 G5
12STD15B6A	12STD15C6A	0152C9069 G6
12STD16B1A	12STD16C3A	0152C9069 G7
12STD16B2A	12STD16C4A	0152C9069 G8
12STD16B3A	12STD16C3A	0152C9069 G9
12STD16B4A	12STD16C4A	0152C9069 G10
12STD16B5A	12STD16C5A	0152C9069 G11
12STD16B6A	12STD16C6A	0152C9069 G12
12STD16B7A	12STD16C7A	0152C9069 G13
12STD17B1A	12STD17C2A	0152C9069 G14
12STD17B2A	12STD17C2A	0152C9069 G15
12STD18B1A	12STD18C2A	0152C9069 G16
12STD18B2A	12STD18C2A	0152C9069 G17
12STD18B3A	12STD18C3A	0152C9069 G18
12STD18B4A	12STD18C4A	0152C9069 G19
12STD21B1A	12STD21C1A	0152C9069 G20
12STD25B1A	12STD25D2A	0152C9069 G21
12STD25B2A	12STD25D2A	0152C9069 G22
12STD25C1A	12STD25E2A	0152C9069 G23
12STD25C2A	12STD25E2A	0152C9069 G24
12STD26B1A	12STD26C1A	0152C9069 G25
12STD28B1D	12STD28C1D	0152C9069 G26
12STD28B2D	12STD28C2D	0152C9069 G27
12STD29B1D	12STD29C1D	0152C9069 G28
12STD29B2D	12STD29C2D	0152C9069 G29

Extract From General Electric Service Letter

STD RELAYS
TRANSFORMER DIFFERENTIAL RELAY

In line with our policy of keeping users informed of conditions which could possibly affect relay operation, the following information is provided on type STD transformer differential relays.

Three customers have reported that the zener diodes or the associated dropping resistors on the STD Sense Amplifier Card have failed shorted. The problem has been traced to two zener diodes whose cases have been physically touching, short circuiting one diode and overloading the circuit. There are several possible causes of such isolated failures including the possibility of mishandling during test. Incorrect STD relay trip outputs are associated with such a failure in this circuit. Tests have shown that, with these components touching, the STD relay is also vulnerable to misoperation on DC transients.

Because of these reported problems, it is suggested that the clearance between the two 1N3024 diode cases and other component lead clearances on the sense amplifier card be visually inspected during routine STD test or maintenance.