UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555-0001

March 24, 1997

NRC INFORMATION NOTICE 97-12: POTENTIAL ARMATURE BINDING IN GENERAL ELECTRIC TYPE HGA RELAYS

Addressees

All holders of operating licenses or construction permits for nuclear power reactors.

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to alert addressees that two General Electric (GE) type HGA relays failed to reposition when the coils were deenergized. It is expected that recipients will review this information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this information notice are not NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances

On May 15, 1996, Commonwealth Edison Company (ComEd) reported that two 12HGA17S63 relays installed in the reset logic for the primary containment isolation system at its Dresden Nuclear Power Station, Unit 3, failed to reposition when operators removed power to the relay coils. The relay failures resulted in a failure to seal in isolation signals to a main steam isolation valve and a recirculation sample isolation valve when operators reset a scram signal after a reactor scram. Consequently, the valves opened when the scram was reset. Operators used the manual switches in the control room to reclose the valves. ComEd personnel removed the relays and disassembled them in an attempt to determine the root cause of the problem. When a root cause could not be determined, the failed relays were sent to GE Power Management (GE PM), located in Malvern, Pennsylvania, for a thorough investigation.

Discussion

GE PM reassembled the failed relay submitted by ComEd for a root cause analysis and it operated properly, both mechanically and electrically. When GE PM performed a dimensional analysis of the critical parts, however, the assembly hole of the molded contact support was found to be slightly off-center. GE PM stated that the mold that produces the contact support was reworked in 1990 to correct for mold wear and to bring the parts within the design drawing tolerances.

GE PM issued Relay Service Advice Letter 516.1 on October 25, 1996, to alert customers that HGA relays manufactured between January 1989 and June 1991 may have marginal armature-to-contact support clearance and may be susceptible to armature binding.

However, some licensees may have procured the relays as commercial-grade, or received them as basic components from a dedicating entity and, therefore, may not have received the attached GE relay service advice letter. Consequently, some licensees may not have had the opportunity to evaluate the information in accordance with 10 CFR Part 21.

This information notice requires no specific action or written response. If you have any questions about the information in this notice, please contact one of the technical contacts listed below or the appropriate Office of Nuclear Reactor Regulation (NRR) project manager.

Thomas T. Martin, Director
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Technical contacts: K. Naidu, NRR
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S. Alexander, NRR
(301) 415-2995
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Attachments:
1. GE Relay Service Advice Letter 516.1
   dated October 25, 1996
2. List of Recently Issued NRC Information Notices

Attachment Filed in Jacket

MULTILIN

GE Power Management

General Electric Company
205 Great Valley Parkway, Malvern, PA 19355-1337
610 251-7000

RELAY SERVICE ADVICE LETTER

Subject: HGA Armature Binding
Issued by: Customer Service
Prepared by: Peter A. Kotos

Number: 516.1
Date: 10/25/96

There has been a report of incorrect operation of an HGA17S63 relay (date code: December, 1989). The relay had been continuously energized and failed to provide correct contact operation when de-energized. It was reported that the relay armature was not moving freely, it was mechanically binding at the hinge area.

The relay was returned for examination. We examined the relay and were not able to reproduce the binding condition that was reported. (The relay was returned disassembled. When assembled the relay operated properly electrically and mechanically).
However, a dimensional analysis of the most critical parts indicated that the molded contact support was slightly out of tolerance. Specifically, the assembly hole of the contact support was slightly off center.

It is conceivable that this offset combined with the manufacturing tolerances of the armature and magnet frame, possible foreign matter in the hinge area and maybe excessive side pressure applied to the contact support when assembled could cause friction between the contact support and magnetic frame resulting in armature binding.

According to our Manufacturing Engineering, the mold that produces the contact support was reworked in 1990 to correct for mold wear and bring the part well within the drawing tolerances. Currently produced contact supports were checked and are well within the drawing tolerances and do not produce armature binding.

Based on the field report, it is assumed that some HGA's may have been shipped with a marginal condition of armature clearance until this condition was noted by Quality Control and the mold was corrected.

Although it is not possible to determine exactly when the possible problem began, it is estimated that relays manufactured between January, 1989, and June, 1991, (Date Codes: ND, OD, PD, RD, SD, TD, UD, VD, WD, XD, YD, ZD, NE, OE, PE, RE, SE, TE, UE, VE, WE, XE, YE, ZE, NF, OF, PF, RF, SF, AND TF) are suspect and may be checked for armature binding as follows:

1. De-energize the relay, coil and contacts.
2. Close the armature fully by hand, (push armature against the pole, see Fig. 1), and gradually release. For correct operation, the armature should move to the fully open position with no binding and with correct contact action. The normally open contacts should open and the normally closed contacts should close. If binding is detected, we recommend the following:

For "Nuclear 1E" Applications: Contact General Electric Nuclear Energy Division Customer Service Hotline: 1-800-425-8108 and refer to Service Advice No. 516.1.

For "Non - 1E" Applications: A replacement contact support is recommended.

Replacement contact supports (Part Number: 006118683P1) are available on a no-charge basis and should be ordered through your local GE district Sales Office. Requests for the contact supports must include:

A. A reference to Service Advice No. 516.1
B. Date codes of the relays for which the replacement contact supports will be used.

Installation of the contact support may be accomplished by following the steps outlined in Attachment A.

Replacement contact supports will be available through November 1, 1997.
Labor for installation of the contact support or relay are the responsibility of the purchaser.

ATTACHMENT A - SA #516.1

The contact support should be replaced as follows: (Refer to Fig. 1)

1. Disengage the control spring from the armature end. (Note the groove location of the spring hook on the armature).
2. Remove the assembly screw with its lockwasher.
3. Remove the nameplate and spring housing assembly.
4. Remove the moving contacts from the contact support and note their location for correct reassembly.
5. Remove the contact support.
6. Install the new contact support. Make sure the armature is seated properly in the contact support.
7. Locate the moving contacts in the contact support.
8. Install the nameplate and spring housing assembly.
9. Tighten the assembly screw and lockwasher (16 in-lbs. approx.). Hold contact support and spring housing assembly together while tightening assembly screw.
10. Engage the control spring on the same groove on the armature of the relay.
11. Operate the armature of the relay by hand to make sure that there is no binding.
12. Electrically check, and adjust if needed, the pickup of the relay in accordance with instructions given in the Instruction Book of the particular relay model number.

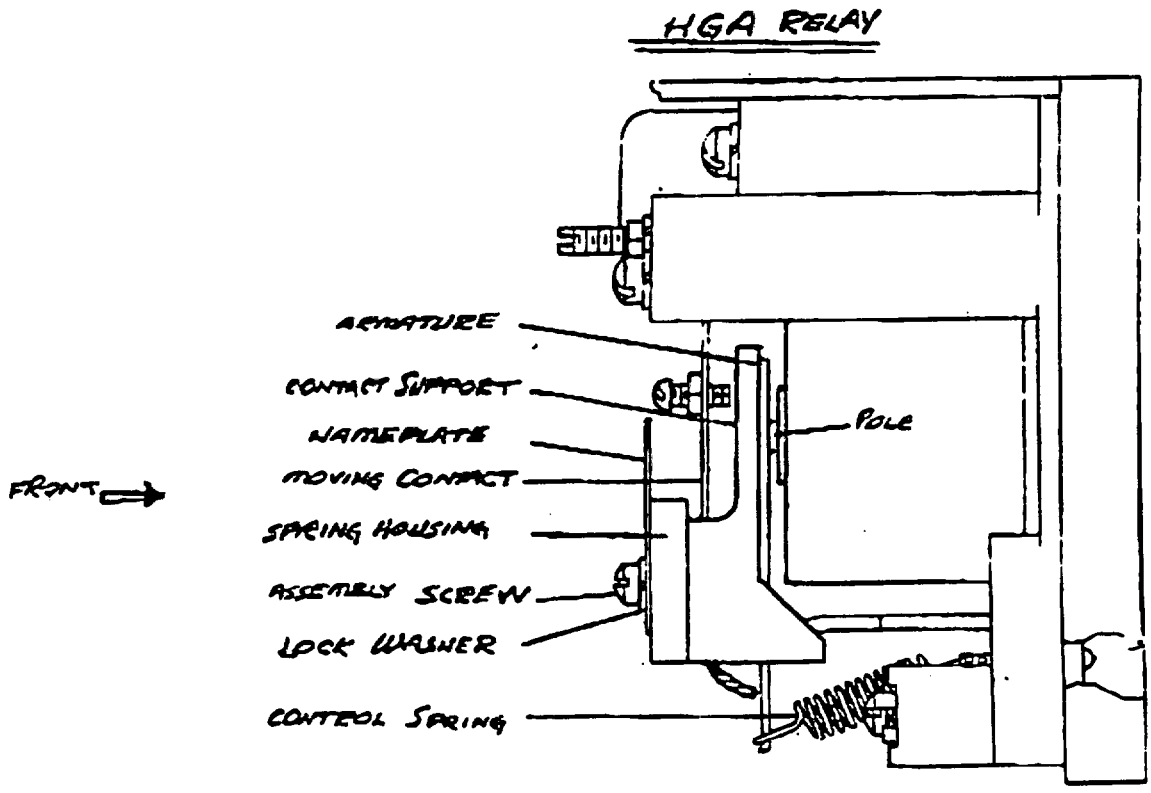

FIG. 1. (SIDE VIEW)

LIST OF RECENTLY ISSUED NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
92-27, Supp. 1	Thermally Induced Accelerated Aging and Failure of ITE/ Gould A.C. Relays Used in Safety-Related Applications	03/21/97	All holders of OLs or CPs for nuclear power reactors
97-11	Cement Erosion from Containment Subfoundations at Nuclear Power Plants	03/21/97	All holders of OLs or CPs for nuclear power reactors
97-10	Liner Plate Corrosion in Concrete Containments	03/13/97	All holders of OLs or CPs for power reactors
97-09	Inadequate Main Steam Safety Valve (MSSV) Setpoints and Performance Issues Associated with Long MSSV Inlet Piping	03/12/97	All holders of OLs or CPs for nuclear power reactors
97-08	Potential Failures for General Electric Magne-Blast Circuit Breaker Subcomponents	03/12/97	All holders of OLs or CPs for nuclear power reactors
97-07	Problems Identified During Generic Letter 89-10 Closeout Inspections	03/06/97	All holders of OLs or CPs for nuclear power reactors

OL = Operating License
CP = Construction Permit

GE PM issued Relay Service Advice Letter 516.1 on October 25, 1996, to alert customers that HGA relays manufactured between January 1989 and June 1991 may have marginal armature-to-contact support clearance and may be susceptible to armature binding.

However, some licensees may have procured the relays as commercial-grade, or received them as basic components from a dedicating entity and, therefore, may not have received the attached GE relay service advice letter. Consequently, some licensees may not have had the opportunity to evaluate the information in accordance with 10 CFR Part 21.

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original signed by M.M. Slosson

Thomas T. Martin, Director
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   dated October 25, 1996
2. List of Recently Issued NRC Information Notices

*SEE PREVIOUS CONCURRENCE

Tech Editor has reviewed and concurred on 2/14/97

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OFC	D/DRPM
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DATE	02/20/97	02/24/97	2/24/97	2/24/97	2/27/97

OFC	D/DRPM
NAME	T. Martin
DATE	/ /97

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