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

August 19, 1988

NRC INFORMATION NOTICE NO. 88-69: MOVABLE CONTACT FINGER BINDING IN HFA RELAYS MANUFACTURED BY GENERAL ELECTRIC (GE)

Addressees:

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

Purpose:

This information notice is being provided to alert addressees to potential problems resulting from binding of the movable contact fingers in HFA relays manufactured by GE. It is expected that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

On August 12, 1988, GE submitted a written 10 CFR Part 21 notification to the NRC concerning binding of the movable contact fingers in HFA relays. GE stated that one user of HFA relays had reported difficulty making wipe and gap settings on some of their HFA relays due to binding of a movable contact finger in the phenolic support assembly. The root cause of the binding was determined to be movable contacts that were manufactured wider than the allowable tolerance. These wider contact arms may not float freely in the slot provided in the phenolic support. GE also stated that the binding of a movable contact arm could interfere with the relay contact wipe, and that proper contact wipe is necessary to maintain correct operation and seismic rating of the relay. In addition, GE recommended that all HFA relays having a date code prior to WC (September, 1988) be checked to determine if a movable contact finger binding condition exists.

A copy of the GE 10 CFR Part 21 notification is provided as Attachment 1.

The primary purpose of this information notice is to promptly alert addressees of this situation. Addressees may wish to promptly contact GE concerning additional details related to the potential for HFA relays not performing their intended function. The NRC staff is continuing to review this situation. Additional regulatory action will be taken, if appropriate, upon completion of the staff's review.

IDHR-11C

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact one of the technical contacts listed below or the Regional Administrator of the appropriate regional office.

Charles E. Rossi, Director
Division of Operational Events Assessment
Office of Nuclear Reactor Regulation

Technical Contacts: Ray Scholl, NRR
(301) 492-1171

Jack Ramsey, NRR
(301) 492-1167

Attachments:
1. GE 10 CFR Part 21 Notification dated August 12, 1988
2. List of Recently Issued NRC Information Notices

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GE Meter & Control

General Electric Company
205 Great Valley Parkway, Malvern PA 19355-1315

August 12, 1988

Mr. Vince Thomas
United States Nuclear Regulatory Commission
Washington, DC 20555

Subject: Type HFA relay with movable contact finger binding

Dear Mr. Thomas:

This letter is to notify you of a reportable condition under 10CFR21 related to HFA auxiliary relays manufactured by our department.

We classified this as a reportable condition after an investigation of a report from a customer who had difficulty in making wipe and gap settings on HFA relays due to binding of a movable contact finger.

The attached service advice letter 192.1 is being sent to all purchasers of these relays who specified "Nuclear 1E", or equivalent on the order. The attachment explains the nature of a possible binding condition. Users must determine from their application of the relay if a safety hazard could be created by such condition.

All HFA relays having a date code prior to WC (September, 1988) should be checked per the service advice to determine if a movable contact finger binding condition exists.

Sincerely yours,

Steve Duerwachter

S. S. Duerwachter
Manager, Marketing and
Product Engineering

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Attachment

General Electric Company
205 Great Valley Parkway Malvern PA 19355-0715

RELAY AND ACCESSORY SERVICE ADVICE LETTER

Subject: HFA Moving Contact Finger Binding

Number 192.1
August 12, 1988

Issued by: R. R. Hammer
Prepared by: S. S. Duerwachter

One user of HFA relays has reported difficulty making wipe and gap settings on some of their relays due to binding of a movable contact finger in the phenolic support assembly.

Our investigation of the suspect devices has confirmed the binding and identified the root cause as moving contacts which were manufactured wider than the allowable tolerance. The wider contact arm may not float freely in the slot provided in the phenolic support. The binding of the moveable contact arm could interfere with the relay contact wipe. Proper contact wipe is necessary to maintain correct operation and seismic rating of the relay.

Tooling used to manufacture the contacts has been corrected and applied to relays manufactured after August 12, 1988, date code WC and later. Relays made before this date should be checked for possible binding.

Although the impact of this Service Advice effects all relays in service, the test to determine if the problem exists is easy and the risk for in service failures is remote.

Binding of the movable contact fingers may be identified by pulling each moving contact toward the front of the relay until the finger hits its stop, then depressing it toward the back of the relay until no further movement is possible. Next gradually remove the force applied. When all force is removed, the moving contact should return to its original position. A binding contact finger will not freely return to its original position.

If finger binding is experienced, replacement relays or contact armature assemblies are available as follows:

For Nuclear 1E Applications, a replacement relay is recommended. Replacement relays should be ordered through your local GE district sales office. Relays ordered before October 1, 1989 will be furnished at 60% of the published handbook price. Requests for replacement HFA's must include:

A. Relay model number and contact code

B. A reference to Service Advice No. 192.1

C. Requisition number and purchase order under which the original relay was furnished

D. Nuclear Damage Waiver

For Non-1E Applications, a replacement contact armature assembly is recommended.

Installation of the assembly may be accomplished by following the steps outlined on Attachment A. Replacement armature assemblies are available on a no-charge basis and should be ordered through your local GE district sales office. Requests for the armature assemblies must include:

A. Relay model number and contact code

B. A reference to Service Advice No. 192.1

C. Date codes of the relays for which the replacement armatures will be used.

Replacement armature assemblies will be available through October 1, 1989. Labor for installation of the armature assemblies or relay are the responsibility of the purchaser.

ATTACHMENT A - S. A. 192.1

The contact armature assembly should be replaced and adjusted as follows to maintain proper relay operation.

REPLACEMENT

1. Remove the screw and lock washer holding the moving contact pigtails to the base for each of the six moving contacts.
2. Lift the control spring adjusting screw out of the armature slot and let it move to a rest position.
3. Slide out the existing contact and armature assembly and replace with new assembly.
4. Fasten the moving contact pigtails to the base with the existing screws and lock washers.
5. Form the pigtails in a loop without any kinks.
6. Replace the control spring adjusting screw in the armature slot.

ADJUSTMENTS

1. All normally open "a" contacts shall have a wipe of 3/64 to 3/32 of an inch. This can be adjusted by forming the moving contacts. If the relay has only normally open contacts, the stop screw should be adjusted to give approximately a 7/32 inch contact gap.
2. All normally closed "b" contacts shall have a wipe of 0.067 inches $\pm$ .010 inches. This can be accomplished by using the stop screw as a more accurate wipe measurement. The proper wipe can be obtained by forming the moving contacts.
3. Connect a continuity light to each of the normally closed contacts.
4. Loosen the stop screw locknut and turn the stop screw clockwise until the first of the normally closed contacts open.
5. Turn the stop screw an additional 1-1/4 turns and all the normally closed contact lights should go out indicating that the normally closed contacts are adjusted within 1/32 of an inch overall from the first open to the last open.
6. Return the stop screw so that there is approximately 1/8 inch between the end of the stop screw and armature and then tighten the lock nut.

ELECTRICAL TESTS

Set the relay pickup between 55-61% of rated for DC relays and between 75-81% of rated for AC relays by adjustment of the armature control spring.

LIST OF RECENTLY ISSUED
NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
88-48, Supplement 1	Licensee Report of Defective Refurbished Valves	8/24/88	All holders of OLs or CPs for nuclear power reactors.
88-68	Setpoint Testing of Pressurizer Safety Valves with Filled Loop Seals Using Hydraulic Assist Devices	8/22/88	All holders of OLs or CPs for nuclear power reactors.
88-67	PWR Auxiliary Feedwater Pump Turbine Overspeed Trip Failure	8/22/88	All holders of OLs or CPs for nuclear power reactors.
88-66	Industrial Radiography Inspection and Enforcement	8/22/88	All NRC industrial radiography licensees.
88-65	Inadvertent Drainages of Spent Fuel Pools	8/18/88	All holders of OLs or CPs for nuclear power reactors and fuel storage facilities.
88-64	Reporting Fires in Nuclear Process Systems at Nuclear Power Plants	8/18/88	All holders of OLs or CPs for nuclear power reactors.
88-63	High Radiation Hazards from Irradiated Incore Detectors and Cables	8/15/88	All holders of OLs or CPs for nuclear power reactors, research reactors and test reactors.
88-62	Recent Findings Concerning Implementation of Quality Assurance Programs by Suppliers of Transport Packages	8/12/88	All holders of NRC quality assurance program approval for radioactive material packages.
88-61	Control Room Habitability - Recent Reviews of Operating Experience	8/11/88	All holders of OLs or CPs for nuclear power reactors.

OL = Operating License
CP = Construction Permit

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OGCB:DOEA	LAB:DOEA	C:OGCB:DOEA	D:DOEA
JERamsey	RScholl	CHBerlinger	CERossi
8/19/88	8/19/88	8/19/88	8/19/88