CENTRALFILES

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
631 PARK AVENUE
KING OF PRUSSIA, PENNSYLVANIA 19406

Docket No. 50-220

NOV 02 1979

Niagara Mohawk Power Corporation
ATTN: Mr. R. R. Schneider
Vice President
Electric Operations
300 Erie Boulevard West
Syracuse, New York 13202

Gentlemen:

Enclosed is IE Bulletin No. 79-25 which requires action by you with regard to your power reactor facility(ies) with an operating license or a construction permit.

Should you have questions regarding this Bulletin or the actions required of you, please contact this office.

Sincerely,

Robert T. Carlson for Boyce H. Grier
Director

Enclosures:
1. IE Bulletin No. 79-25 w/attachments
2. List of IE Bulletins Issued in the Last Six Months

CONTACT: S. D. Ebneter
(215-337-5283)

cc w/encls:
T. E. Lempges, General Superintendent, Nuclear Generation
T. J. Perkins, Station Superintendent
C. L. Stuart, Operations Supervisor
E. B. Thomas, Jr., Esquire

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ENCLOSURE 1

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D. C. 20555

SSINS No.: 6820
Accession No.:
7908220139

IE Bulletin No. 79-25
Date: November 2, 1979

FAILURES OF WESTINGHOUSE BFD RELAYS IN SAFETY-RELATED SYSTEMS

Description of Circumstances:

While conducting response time tests on Westinghouse BFD relays at the H. B. Robinson facility, two relays were found to be stuck in the energized position with the coil de-energized. The twenty relays being tested were installed spares and provided no safety-related or operational function. The subject relay is identified as a Westinghouse Electric Corporation type BFD, style 5069A95G03, coil style 1259C71G19. Upon discovery of the two stuck relays in the test program, the licensee conducted response tests on similar relays installed in the Reactor Protection System. During this additional testing a reactor trip relay was found to be stuck in the energized position. Detailed investigation of the problem by the licensee's staff indicated that the armature was sticking to the armature stop post. This condition is apparently created when heat generated by normally energized coils causes a softening and resultant flow of epoxy adhesive used to attach the magnetic antistick disc to the top of the armature stop post. When sufficient adhesive flows to the top of the armature stop, the armature becomes bonded to the stop post, resulting in the relay sticking in the energized position. The epoxy adhesive had also discolored to a dark brown as opposed to clear in new relays.

After reviewing this problem, Westinghouse issued a service letter dated December 6, 1978. A copy of this letter is attached for your information and appropriate use. Westinghouse recommended replacing affected relays with a relay identified as NBFD, style 5072A49, coil style 1271C50G01, 125/130 Volt DC ± 10 percent.

During installation and testing of the new NBFD relays identified by Westinghouse, H. B. Robinson determined that some of the new style relays exhibited marginal or unsatisfactory armature overtravel. An investigation of the problem by Westinghouse indicated that the insufficient overtravel was limited to eight and twelve pole models of the NBFD relays. Westinghouse issued a Technical Bulletin NSD-TB-79-05 to Licensees. A copy of this Technical Bulletin is also attached for your information and use. Westinghouse recommended a testing method for identifying relays with insufficient over travel and also recommended replacement of relays with insufficient overtravel.

Action to be Taken by Licensees:

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

1. Determine whether or not the following Westinghouse BFD/NBFD relays are used or planned for use in safety-related systems at your facilities:

   a. Type BFD, style 46E7352 or 766A235, coil style 503C428G21
   b. Type BFD, style 5069A95, coil style 1259C71G19
   c. Type BFD, style 5072A49, coil style 1271C50G01

2. If such relays are used or planned for use, identify the safety-related systems involved, specific function of relays and provide in written form your plans for a test and/or replacement program which will assure design performance of affected relays.

3. The program to assure performance of affected relays shall include, but not be limited to the following:

   a. Establishment and adherence to a periodic testing and/or replacement schedule to assure operability of applicable relays.

   b. The basis for the test interval of 3a. above including the data base upon which the initial test schedule is established.

   c. Development of approved procedures to be utilized by qualified personnel for the testing and/or replacement of applicable relays.

   d. Relay failures found during program testing are to be documented in final report and reported at the time of finding in accordance with license requirements.

4. For facilities with an operating license, a written report of the above actions, including date(s) when they will be completed, shall be submitted within 45 days of receipt of this Bulletin.

5. For facilities with a construction permit, a written report of the above actions, including the date(s) when they will be completed, shall be submitted within 60 days of the receipt of this Bulletin.

Reports should be submitted to the Director of the appropriate NRC Regional Office. A copy of your report should be sent to the U. S. Nuclear Regulatory Commission, Office of Inspection and Enforcement, Division of Reactor Operation Inspection, Washington, D. C. 20555.

Approved by GAO, G180225 (R0072); clearance expires July 31, 1980. Approval was given under a blanket clearance specifically for identified generic problems.

Attachments:
1. Extract from Westinghouse Service Letter TS-E-412, Dated December 6, 1978
2. Extract from Westinghouse Technical Bulletin, NDS-TB-79-05

Attachment to IE Bulletin 79-25

EXTRACT OF WESTINGHOUSE LETTER TS-E-412, DECEMBER 6, 1978

An operating nuclear plant recently encountered difficulties with BFD relays, and follow-up investigation revealed that the relays involved were not the latest, currently recommended version of the relay.

As indicated in our Technical Bulletin NSD-TB-78-16, the improved recommended relay is identified as follows: NBFD relay-Style No. 5072A49, Series (State pole configuration required). Coil - Style No. 1271C50G01 125/130 volt DC ± 10 percent.

(Note: These relays are currently identified by the manufacturer as "NBFD" relays. However, it is possible that some of the earlier relays of this type manufactured in early 1977 did not include the "N" prefix.)

This relay has been available only since December 1976. Prior to that time, the 125/130 volt BFD relays in use were Style 766A235 with Style 503C428G21 coils (until 1973), and Style 5069A95 relays, with Style 1259C71G19 coils (from 1973 until December 1976).

We recommend that either of these relays, in a safety-related application, should be replaced by relays identified in the second paragraph above. Our earlier recommendation in TB 76-16 indicated that only normally-energized relays need be replaced. This is still a justifiable position. However, for uniformity purposes and for an added measure of reliability, customers may wish to install these recommended relays in all safety-related applications whether normally energized or normally de-energized.

In any case where older style BFD's are still in service in normally energized safety-related applications, we reiterate the recommendation stated in TB-76-16 and 76-5 that the relays be visually checked for free operation during periodic testing. At the next convenient plant shutdown, the recommended relays should be installed.

Attachment 2 to IE Bulletin 79-25

EXTRACT OF WESTINGHOUSE
TECHNICAL BULLETIN, NSD-TB-79-05

BACKGROUND INFORMATION

The referenced 1976 Technical Bulletin described problems with type BFD (dc) control relays, and identified a new improved style of BFD relays which were designated for greater reliability. The new device was identified as relay style number 5072A49 (followed by the letter G and a two-digit number, depending on pole configuration), with coil style number 1271C50G01. This new relay was first made available in December of 1976; thereafter, they were identified as "NBFD".

In mid-1978, initial reports were received that some of the new style relays exhibited marginal or unsatisfactory contact-making characteristics due to insufficient armature travel, which results in insufficient overtravel of the moving contact. The manufacturing division (Westinghouse Standard Control Division) originally felt that the problem was limited to a relatively narrow "batch" of relays, and certain users were so notified. However, recent revelation of additional causes of relays with insufficient overtravel indicates that all eight pole relays (Models 44, 62, 26, 80, etc.) and all twelve pole relays (Models 66, 84, 48, 120, etc.) of this style should be considered suspect until contact overtravel can be confirmed by measurement, or the relays are replaced with relays known to have adequate overtravel.

Four pole relays (Models 22, 31, 13, 40, etc.) may be excluded from the measurement and the concern described above since they utilize a different armature not susceptible to the potential travel problem.

RECOMMENDED ACTION

Relays in question are all eight pole and twelve pole NBFD relays, or any BFD relay style number 5072A49. G** (except four pole relays G01, G02, G03, G04, G16 and G19) with coil style number 1271C50G01. Any such relay in storage, or installed in a safety-related application, must be checked at the earliest possible opportunity to confirm adequate contact overtravel.

The manufacturer has established 0.020 (twenty thousands) inch as the minimum acceptable overtravel, with overtravel being defined as the distance the relay armature travels beyond the point at which normally open (n.o.) contacts make. In multi-pole relays, the overtravel definition applies to the last n.o. contacts to physically close.

We recognize that the measurements described above may mean removal of the relays. Any relays showing inadequate overtravel should be returned to Westinghouse for rework or replacement.

The following points may be of assistance in making the above measurements:

- Disassembly of the relay in order to make the overtravel measurement is not necessary. Armature travel, as taken from the cross-bar or the top "button" maybe used as an indicator of moving contact travel.

- Electrical operation of the relay in order to make the measurement is not necessary. Manual operation of the armature provides the same amount of travel as is obtained in electrical operation.

- The relay need not be in its normal armature-horizonal position in making the measurement. For purposes of this test, vertical travel of the armature will not significiantly affect overtravel characteristics.

- Although the manufacturer has not established a maximum acceptable overtravel, personnel obtaining the measurements may be interested in knowing that forty-seven thousandths was the designated overtravel, and as much as 50 and 60 thousandths has been found on normal relays.

- Use of the depth gauge position of a dial vernier caliper has been found to be a convenient method of measuring the overtravel, with lamp and battery (maximum of six volts and minimum of three volts) circuit indicating closure of the contacts in series.

Note: Subsequent to issuance of the above information by Westinghouse, it has been determined by tests performed by H. B. Robinson that a preliminary check of in-rack relays is acceptable. This preliminary check can be performed with a six-inch pocket scale with 1/64 inch increments. If armature overtravel is less than 1/32 inch, the relay should be tested further as described above. Normal overtravel measured by this preliminary check is approximately 1/16 inch.

ENCLOSURE 2

LISTING OF IE BULLETINS
ISSUED IN LAST SIX MONTHS

Bulletin No.	Subject	Date Issued	Issued To
79-10	Requalification Training Program Statistics	5/11/79	All Power Reactor Facilities with an OL
79-11	Faulty Overcurrent Trip Device in Circuit Breakers for Engineered Safety Systems	5/22/79	All Power Reactor Facilities with an OL or CP
79-12	Short Period Scrams at BWR Facilities	5/31/79	All GE BWR Facilities with an OL
79-01A	Environmental Qualification of Class 1E Equipment (Deficiencies in the Environmental Qualification of ASCO Solenoid Valves)	6/6/79	All Power Reactor Facilities with an OL or CP
79-02 (Rev 1)	Pipe Support Base Plate Design Using Concrete Expansion Anchor Bolts	6/21/79	All Power Reactor Facilities with an OL or CP
79-13	Cracking in Feedwater System Piping	6/25/79	All PWRs with an OL (for Action), All Other Power Reactor Facilities with an OL or CP (For Information)
79-14	Seismic Analysis for As-Built Safety Related Piping Systems	7/2/79	All Power Reactor Facilities with an OL or CP

LISTING OF IE BULLETINS
ISSUED IN LAST SIX MONTHS (CONTINUED)

Bulletin No.	Subject	Date Issued	Issued To
79-15	Deep Draft Pump Deficiencies	7/11/79	All Power Reactor Facilities with an OL or CP
79-14 (Revision 1)	Same Title as 79-14	7/18/79	Same as 79-14
79-16	Vital Area Access Controls	7/30/79	All Holders of and Applicants for Reactor Operating Licenses
79-17	Pipe Cracks in Stagnant Borated Water Systems at PWR Plants	7/26/79	All PWR Power Reactor Facilities with an OL
79-05C&06C	Nuclear Incident at Three Mile Island - Supplement	7/26/79	All PWR Power Reactor Facilities with an OL
79-18	Audibility Problems Encountered on Evacuation	8/7/79	All Power Reactor Facilities with an OL
79-19	Packaging Low-Level Radioactive Waste for Transport and Burial	8/10/79	All Power and Research Reactors with OL, all Fuel Facilities (except Uranium Mills), and certain Materials Licensees
79-20	Same Title as 79-19	8/13/79	Certain Materials Licensees
79-21	Temperature Effects on Level Measurements	8/13/79	All Power Reactor Facilities with an OL or CP

LISTING OF IE BULLETINS
ISSUED IN LAST SIX MONTHS (CONTINUED)

Bulletin No.	Subject	Date Issued	Issued To
79-14 (Supplement)	Same Title as 79-14	8/15/79	Same as 79-14
79-02 (Rev 1) (Supplement No. 1)	Same Title as 79-02	8/20/79	Same as 79-02 (Rev 1)
79-13 (Rev 1)	Cracking in Feedwater System Piping	8/30/79	All Designated Applicants for OLs
79-22	Possible Leakage of Tubes of Tritium Gas Used in Timepieces for Luminosity	9/5/79	Each Licensee who Receives Tubes of Tritium Gas in Timepieces for Luminosity
79-14 (Supplement No. 2)	Same as Title 79-14	9/7/79	Same as 79-14
79-23	Potential Failure of Emergency Diesel Generator Field Exciter Transformer	9/12/79	All Power Reactor Facilities with an OL or CP
79-24	Frozen Lines	9/27/79	All Power Reactor Facilities which have either OLs of CPs and are in late stage of construction
79-13 (Rev. 2)	Cracking in Feedwater System Piping	10/17/79	All PWRs with an OL and Designated Applicants (for Action), All Other Power Reactor Facilities with an OL or CP (for Information)

LISTING OF IE BULLETINS
ISSUED IN LAST SIX MONTHS (CONTINUED)

Bulletin No.	Subject	Date Issued	Issued to
79-17	Pipe Cracks in Stagnant Borated Water Systems at PWR Plants	10/29/79	All PWRs with an OL (for Action). All other Power Reactor Facilities with an OL or CP (for Information)