

General Information or Other (PAR)

Event # 41397

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| <b>Rep Org:</b> DOMINION              | <b>Notification Date / Time:</b> 02/10/2005 14:23 (EST) |
| <b>Supplier:</b> ALLEN-BRADLEY        | <b>Event Date / Time:</b> 02/10/2005 (EST)              |
|                                       | <b>Last Modification:</b> 02/10/2005                    |
| <b>Region:</b> 1                      | <b>Docket #:</b>  |
| <b>City:</b> GLEN ALLEN               | <b>Agreement State:</b> No                              |
| <b>County:</b>                        | <b>License #:</b>                                       |
| <b>State:</b> VA                      |   |
| <b>NRC Notified by:</b> TOM SHAUB     | <b>Notifications:</b> MALCOLM WIDMANN R2                |
| <b>HQ Ops Officer:</b> STEVE SANDIN   | OMID TABATABAI Nnrr                                     |
| <b>Emergency Class:</b> NON EMERGENCY |   |
| <b>10 CFR Section:</b>                |   |
| 21.21 UNSPECIFIED PARAGRAPH           |   |

## PART 21 NOTIFICATION INVOLVING ABNORMAL ALLEN-BRADLEY 700RTC RELAY CONTACT RESPONSE

The following information was submitted via fax:

"Reason for Message: Report a Part 21 - Regarding the abnormal response of Alien-Bradley 700RTC relays when configured with the NC contact in the C5-C6 position.

"Event Date: 2/8/05

"Unit Name: North Anna Power Station

"Component Information (as applicable):

"Manufacturer: Allen-Bradley

"Part Number: 700RTC11110U1

"Description: Abnormal contact response was observed during pre-installation testing of Allen-Bradley 700RTC relays. The 700RTC relays are solid state timing relays used in several Safety Related applications at North Anna. The 700RTC relay provides a wide time adjustment. The relay has two timed contact positions and two instantaneous contact positions. The relays are ordered to a part number that specifies a certain contact arrangement, but the contacts are fully interchangeable and may be configured by the end user in any combination of Normally Open/Normally Closed (NO/NC). Removable contact cartridges mount in the contact slots. At North Anna, Allen-Bradley part number 700RTC11110U1 is used, which is a contact configuration of NO, NC, NO, NC.

"The relays were setup and tested in a NO, NO, NC, NC configuration when it was discovered that the instantaneous contact (C5-C6 position), with a NC contact cartridge installed, behaved like a timed contact. The C5-C6 position changed state according to the setting of the timer. All other contact positions worked properly. With a NO contact installed in the C5-C6 position, the contact position behaved as expected (as an instantaneous contact). Different NC contact cartridges were installed in the C5-C6 position of the relay and the anomaly still occurred. Forty-five (45) relays were tested for this anomaly. Twelve of 45 relays failed testing (C5-C6 with NC

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contact behaved like a timed contact). The relays were returned to Allen-Bradley for failure analysis. Allen-Bradley has duplicated the anomaly using the returned relays and one from their stock. The root cause is still under investigation.

"The 700RTC relays are used as replacements for Agastat Relays in certain Safety Related applications. Over the past ten years, several 700RTC relays have been installed in various locations at North Anna. At North Anna, the 700RTC relays are purchased commercial grade then upgraded for safety related use using the commercial grade dedication process. The upgrade is performed by the North Anna Materials Verification Lab using an approved commercial grade dedication plan. Prior to identification of this anomaly, the dedication testing verified proper contact operation of the contact cartridges in the as-received configuration. The dedication process now verifies proper contact operation in all possible contact configurations.

"Current and planned 700RTC relay installations were reviewed. The majority of installed 700RTC relays are configured with the contact cartridges arranged according to the 700RTC11110U1 part number (NO, NC, NO, NC). In a few locations, the contact cartridges are configured NO, NO, NC, NC. North Anna does not utilize the C5-C6 position with the NC contact cartridge in any of 700RTC locations.

"Prior to installation, 700RTC relays are bench tested for satisfactory operation.

"Causes: The root cause is unknown at this time, although Allen-Bradley has indicated that the sensitivity of the contact cartridges may be a factor in causing this response.

"Corrective Actions: Nine of the relays that failed bench testing were sent back to Allen-Bradley for analysis. North Anna is working with Allen-Bradley to determine a cause.

"Industry Notification: OE notification No. 19273 - Abnormal response of Allen-Bradley 700RTC relays when configured with the NC contact in the C5-C6 position."

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**Dominion**

INNSBROOK TECHNICAL CENTER  
5000 DOMINION BOULEVARD  
MAIL STOP IN2SE  
GLEN ALLEN, VA 23060

# 41397

Nuclear Licensing and  
Operations Support

TO:

NRC OPS CENTER

TELEPHONE:

(301) 816 5100

LOCATION:

WHITE FLINT

FAX NUMBER:

(301) 816-5151

PAGES TO FOLLOW:

1

FROM:

TOM SHAUB

TELEPHONE:

(804) 273-2763

RETURN FAX NUMBER:

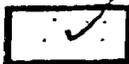
(804) 273-3715

TIE LINE:

NOTES:

PART 21 NOTIFICATION

ALLEN BRADLEY RELAYS



Please Deliver Immediately

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Event Date: 2/8/05  
Unit Name: North Anna Power Station

Component Information (as applicable):  
Manufacturer: Allen-Bradley  
Part Number: 700RTC11110U1

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The relays were setup and tested in a NO, NO, NC, NC configuration when it was discovered that the instantaneous contact (C5-C6 position), with a NC contact cartridge installed, behaved like a timed contact. The C5-C6 position changed state according to the setting of the timer. All other contact positions worked properly. With a NO contact installed in the C5-C6 position, the contact position behaved as expected (as an instantaneous contact). Different NC contact cartridges were installed in the C5-C6 position of the relay and the anomaly still occurred. Forty-five (45) relays were tested for this anomaly. Twelve of 45 relays failed testing (C5-C6 with NC contact behaved like a timed contact). The relays were returned to Allen-Bradley for failure analysis. Allen-Bradley has duplicated the anomaly using the returned relays and one from their stock. The root cause is still under investigation.

The 700RTC relays are used as replacements for Agastat Relays in certain Safety Related applications. Over the past ten years, several 700RTC relays have been installed in various locations at North Anna. At North Anna, the 700RTC relays are purchased commercial grade then upgraded for safety related use using the commercial grade dedication process. The upgrade is performed by the North Anna Materials Verification Lab using an approved commercial grade dedication plan. Prior to identification of this anomaly, the dedication testing verified proper contact operation of the contact cartridges in the as-received configuration. The dedication process now verifies proper contact operation in all possible contact configurations.

Current and planned 700RTC relay installations were reviewed. The majority of installed 700RTC relays are configured with the contact cartridges arranged according to the 700RTC11110U1 part number (NO, NC, NO, NC). In a few locations, the contact cartridges are configured NO, NO, NC, NC. North Anna does not utilize the C5-C6 position with the NC contact cartridge in any of 700RTC locations.

Prior to installation, 700RTC relays are bench tested for satisfactory operation.

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Corrective Actions: Nine of the relays that failed bench testing were sent back to Allen-Bradley for analysis. North Anna is working with Allen-Bradley to determine a cause.

Industry Notification: OE notification No. 19273 - Abnormal response of Allen-Bradley 700RTC relays when configured with the NC contact in the C5-C6 position.