

Part 21 (PAR)

Event # 51030

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| Rep Org: AZZ/NLI NUCLEAR LOGISTICS, INC | Notification Date / Time: 05/01/2015 13:32 (EDT) |
| Supplier: ALLEN BRADLEY | Event Date / Time: 04/30/2015 (CDT) |
| | Last Modification: 04/08/2016 |
| Region: 4 | Docket #: |
| City: FORT WORTH | Agreement State: Yes |
| County: | License #: |
| State: TX | |
| NRC Notified by: TRACY BOLT | Notifications: MEL GRAY R1DO |
| HQ Ops Officer: DANIEL MILLS | FRANK EHRHARDT R2DO |
| Emergency Class: NON EMERGENCY | ROBERT ORLIKOWSKI R3DO |
| 10 CFR Section: | GEOFFREY MILLER R4DO |
| 21.21(d)(3)(i) DEFECTS AND NONCOMPLIANCE | PART 21/50.55 REACTORS EMAIL |

POTENTIALLY UNQUALIFIED COMPONENT IN CERTAIN ALLEN BRADLEY TIMING RELAYS

The following is an excerpt from a document received from the licensee via email:

"Report of potential 10 CFR Part 21, Allen Bradley Timing Relay Model 700RTC

"Pursuant to 10 CFR 21.21(d)(3)(ii), AZZ/NLI is providing written notification of the identification of a potential failure to comply.

"On the basis of our evaluation, it is determined that AZZ/NLI does not have sufficient information to determine if the subject condition would, or has, created a Substantial Safety Hazard or would have created a Technical Specification Safety Limit violation as it relates to the subject plant applications.

"The specific part which fails to comply or contains a defect:

"As of 2009-2010, Allen Bradley relays base model 700RTC, contain an unevaluated CPLD (Complex Programmable Logic Device). This was an unpublished design change that was implemented to replace an obsolete integrated circuit chip. The undocumented design change did not result in a part number change from Allen-Bradley. There was no change to the appearance of the relay that would identify any design changes were made to the relay configuration. Therefore, NLI qualification/dedication of the relays after 2009 have not included additional testing for the new CPLD component.

"The timing relay model 700RTC has been dedicated/qualified for multiple applications for various plants.

"Between 2009-2010 Allen Bradley made a design change without changing the part number of the commercial

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relay or providing any documented evidence of a design change. The manufacturer specification data sheets maintain the classification that the relays are 'solid state', which would imply that there are no digital devices installed in the relay. However, after inspection of the internals of the timing relay (Figure 2), it has been identified that the unit does contain a CPLD which meets the definition of a digital device under the guidance of NEI 01-01."

Potentially affected plants include Browns Ferry, Ginna, Millstone, Nine Mile Point, North Anna, Ft. Calhoun, Perry, River Bend, South Texas Project, and St. Lucie.

*** UPDATE FROM TRACY BOLT TO JOHN SHOEMAKER AT 1744 EDT ON 4/8/16 ***

AZZ/NLI Nuclear Logistics provided additional information regarding Part 21 Report No: P21-04302015, Rev. 1.

Notified R1DO (Rogge), R2DO (Nease), R3DO(Skokowski), R4DO (Kellar), and PART 21/50.55 REACTORS via email.

*** UPDATE FROM LES TAGGART TO BETHANY CECERE AT 0951 EDT ON 5/26/16 ***

AZZ/NLI Nuclear Logistics provided Revision 2 to Part 21 Report No: P21-04302015 to correct the referenced EPRI TR-102323 Rev. 3 to Rev. 4 and change 'timing' contacts to 'instantaneous' contacts as shown below:

"(vii) The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been or will be taken to complete the action.

"The relays that are currently in stock at NLI have been placed on hold until after the units have been determined to be qualified for the specific application. NU has completed the EMC qualification testing per the requirements of EPRI TR-102323 Rev. 4 for the following tests, as applicable: CE101, CE102, RE101, RE102, RS101, RS103, CS101, CS114, CS115 and CS116.

"The results were satisfactory with exception of the following condition: During Conducted Susceptibility CS114 onto the power lines, with the timing circuit in operation, the instantaneous contacts exhibited chatter in the range of 2.6 MHz to 20.3 MHz. The unit requires a ferrite to be installed onto the input power lines of the relay with 3 turns through the ferrite core. In this modified configuration, the relay was not susceptible to Conducted Susceptibility and successfully passed the required test per CS114."

Notified R1DO (Lilliendahl), R2DO (Guthrie), R3DO(Kunowski), R4DO (Werner), and PART 21/50.55 REACTORS via email.



Date: May 26, 2016

To:

FAX (301) 816-5151
Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

From:

Les Taggart
Quality Assurance Program Mgr.
AZZ|NLI Nuclear Logistics
7410 Pebble Drive
Fort Worth, Texas 76118

**UPDATE - Report of potential 10CFR Part 21, Allen Bradley Timing
Relay Model 700RTC
Report No: P21-04302015, Rev. 2**

Previous NRC Event number 51030
Previous Accession No: ML15134A016

Total pages including this page: 7



Date: May 25, 2016

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Part 21 Report No: P21-04302015, Rev. 2

Subject: **Update** - Report of potential 10CFR Part 21, Allen Bradley Timing Relay Model 700RTC – NRC Event Number 51030, Accession Number ML15134A016

Revision 2, corrections:

1. Page 5 (vii), 2nd paragraph: changed EPRI TR-102323 Rev. 3 to Rev. 4.
2. Page 5 (vii), 3rd paragraph: changed 'timing' contacts to 'instantaneous' contacts.

Pursuant to 10CFR 21.21 (d) (3) (ii), AZZ|NLI is providing written notification of the identification of a potential failure to comply.

On the basis of our evaluation, it is determined that AZZ|NLI does not have sufficient information to determine if the subject condition would, or has, created a Substantial Safety Hazard or would have created a Technical Specification Safety Limit violation as it relates to the subject plant applications.

The following information is required per 10CFR 21.21 (d) (4).

(i) Name and address of the individual or individuals informing the Commission.

Tracy Bolt, Director of Quality Assurance
Nuclear Logistics, Inc
7410 Pebble Drive
Ft. Worth, TX 76118

(ii) Identification of the facility, activity, or the basic component supplied for such facility or such activity within the United States which fails to comply or contains a defect.

The specific part which fails to comply or contains a defect:

As of 2009-2010, Allen Bradley relays base model 700RTC, contain an unevaluated CPLD (Complex Programmable Logic Device). This was an unpublished design change that was implemented to replace an obsolete integrated circuit chip. The undocumented design change did not result in a part number change from Allen-Bradley. There was no change to the appearance of the relay that would identify any design changes were made to the relay configuration.

The timing relay model 700RTC has been dedicated/qualified for multiple applications for various plants.

- (iii) **Identification of the firm constructing or supplying the basic component which fails to comply or contains a defect.**

NLI procured the commercial grade relays, dedicated, qualified and supplied the subject relays as Safety Related.

- (iv) **Nature of defect or failure to comply and the safety hazard which is created or could be created by such defect or failure to comply.**

Between 2009-2010, Allen Bradley made a design change without changing the part number of the commercial relay or providing any documented evidence of a design change. The manufacturer specification data sheets maintain the classification that the relays are "solid state", which would imply that there are no digital devices installed in the relay. However, after inspection of the internals of the timing relay (Figure 2), it has been identified that the unit does contain a CPLD which meets the definition of a digital device under the guidance of NEI 01-01. See Figures 1 and 2 below:

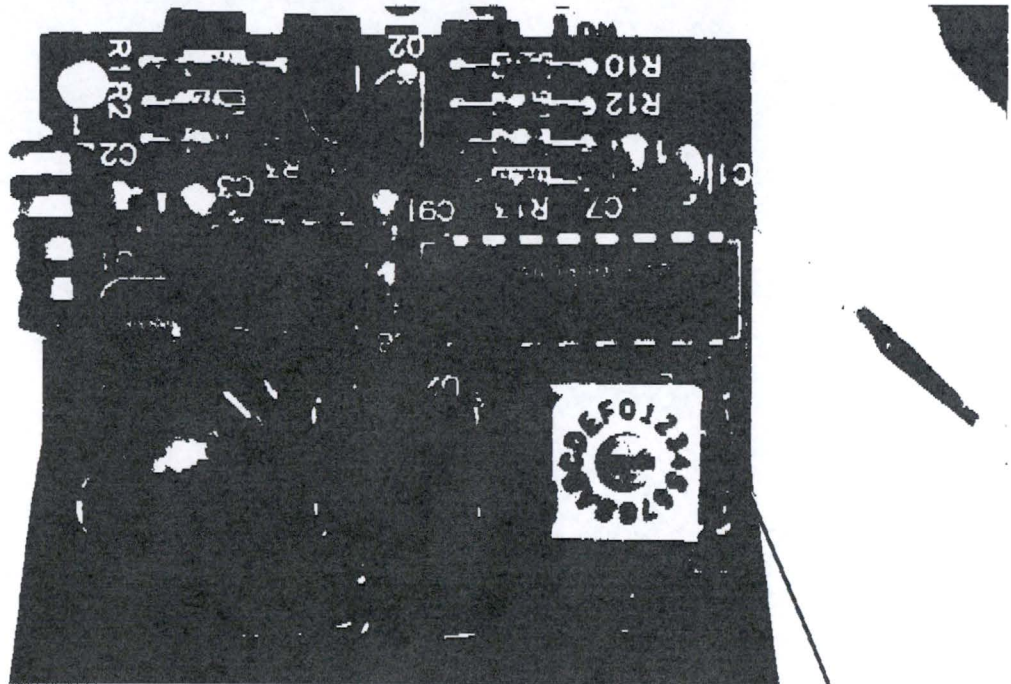


Figure 1- Original qualified design (prior to 2009).
Relays supplied prior to 2009 are not affected by this issue.

Original component

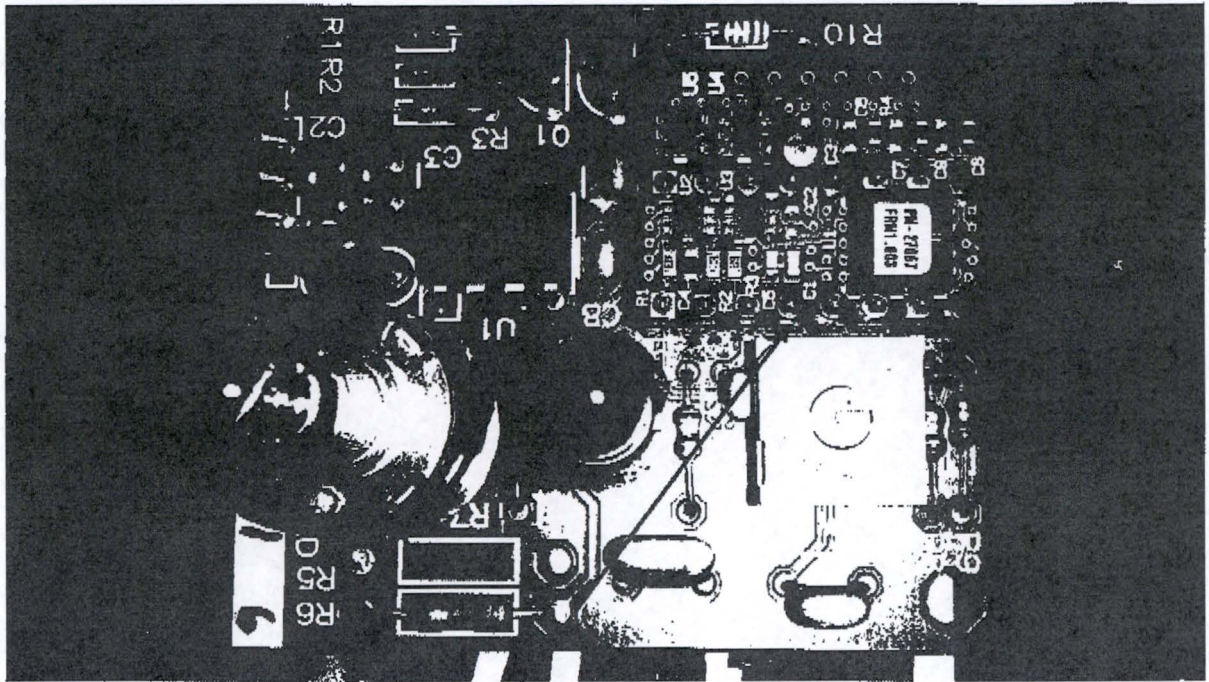


Figure 2 - New design circuit board and CPLD that replaced the original component.

(v) **The date on which the information of such defect or failure to comply was obtained.**

On April 27, 2015, enough information was gathered from the evaluations being performed to determine the reportability of the failure to comply that is the root cause for the event.

- (vi) In the case of a basic component which contains a defect or fails to comply, the number and location of these components in use at, supplied for being supplied for, or may be supplied for, manufactured or being manufactured for one or more facilities or activities subject to the regulations in this part.

Relays that have been procured and dedicated from 2009 to present are identified below.

| Plant Name | Purchase order | Serial Number |
|---------------------|----------------|---|
| Browns Ferry | 72923-1 | 29760-001-00003 |
| Ginna Station | 6617899 | 51475-001-00001 and -00002, 52656K1-01-0001 |
| Grand Gulf | 10304816 | 34182-001-00001 |
| Grand Gulf | 10400205 | 56319-001-00001 |
| Invensys | 4540216542 | 39228-001-00001 thru -00017, 39228-001-00158 thru 39228-001-00166, 39228-001-00170 thru 39228-001-00177 |
| KHNP | Y12-0292-010 | 39407-001-00001 thru -00008, 39407-002-00001 thru -00005 |
| Lungmen | 8749411E007C0 | 38486-001-00001 and -00002, 38486-002-00001 |
| Millstone | 45735761 | 31998K1-01-0001 |
| Millstone | 45735761 | 31391-001-00001 |
| Nine Mile Point | 530734 | 63245-001-00001 thru -00018 |
| North Anna | 70239037 | 55133-001-00001 & -00002 |
| North Anna | 70239037 | 39602-001-00001 and -00002, 39602-002-00001 thru -00003 |
| North Anna | 70239037 | 40033-001-00001 and 40033-001-00002, 40033-002-00001 thru -00003 |
| OPPD Ft Calhoun | 155213 | 33846-001-00001 thru -00009, 33846-001-00011 thru 33846-001-00015, 33846-002-00002 & -00003 |
| OPPD Ft Calhoun | 163495 | 35941-001-00001 thru -00004 |
| OPPD Ft Calhoun | 164936 | 35891K1-01-0001 thru -0005 |
| OPPD Ft Calhoun | 164936 | 36888-001-00001, -00003 thru -00005 |
| OPPD Ft Calhoun | 164936 | 36888K2-01-0001 |
| OPPD Ft Calhoun | 177878 | 39194-001-00001 thru -00006 |
| OPPD Ft Calhoun | 182681 | 40743-001-00001 thru -00003, 40743-002-00001 |
| OPPD Ft Calhoun | 187625 | 51477-001-00001 thru -00004 |
| Perry Station | 45354401 | 33357-001-00001 thru -00003 |
| River Bend Station | 10349942 | 38585-001-00001 thru -00004 |
| River Bend Station | 10362573 | 40077-001-00001 |
| River Bend Station | 10378904 | 51627-001-00001 |
| South Texas Project | 134783 | 33750-001-00001 & -00002 |

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| South Texas Project | 147962 | 37204-001-00001 thru -00006 |
| South Texas Project | 154172 | 51592-001-00001 thru -00004 |
| South Texas Project | 171193 | 57894-001-00001 thru -00006 |
| St Lucie | Bechtel PO: 25486-974- FPA-EMR0-00001 | 38549-001-00002 thru -00005 |

- (vii) **The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been or will be taken to complete the action.**

The relays that are currently in stock at NLI have been placed on hold until after the units have been determined to be qualified for the specific application. NLI has completed the EMC qualification testing per the requirements of EPRI TR-102323 Rev. 4 for the following tests, as applicable: CE101, CE102, RE101, RE102, RS101, RS103, CS101, CS114, CS115 and CS116.

The results were satisfactory with exception of the following condition: During Conducted Susceptibility CS114 onto the power lines, with the timing circuit in operation, the instantaneous contacts exhibited chatter in the range of 2.6 MHz to 20.3 MHz. The unit requires a ferrite to be installed onto the input power lines of the relay with 3 turns through the ferrite core. In this modified configuration, the relay was not susceptible to Conducted Susceptibility and successfully passed the required test per CS114.

In addition to the EMC testing that was performed, the Verification and Validation / Dedication activities for the digital device was also completed. The results of the dedication activity are contained in NLI Verification and Validation/Dedication report VVR-700RTC-01, Rev. 1. The results of the V&V/dedication activity are satisfactory. The firmware version verified is the only version that has been released since the change was implemented.

- (viii) Any advice related to the defect or failure to comply about the facility, activity, or basic component that has been, is being, or will be given to purchasers or licensees.

The functions of the relays supplied by NLI were tested for the following critical characteristics:

- Pick-up at rated voltage
- Drop-out when the voltage is removed
- Pick-up at degraded voltage
- Over-Voltage operation
- Insulation resistance
- Off delay settings are adjustable from 2-120 seconds
- Pick-up voltage
- Drop-out voltage
- Dimensions and Configuration

The relays are dedicated for generic application usage in timing applications. The specific plant application(s) is unknown by NLI. The EMC qualification of the relay is dependent on the installed configuration and location in the plant. The plant should evaluate whether the installed relays are subjected to the specific EMI/RFI condition Conducted Susceptibility CS114 between the frequencies of 2.6 MHz to 20.3 MHz identified above.

Please contact me with any questions or comments.

Sincerely,



Les Taggart
Quality Assurance Program Manager