

Part 21 (PAR)

Event # 49911

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|--|-----------------------------------|---|-----|
| Rep Org: WATERFORD STEAM ELECTRIC STATION | | Notification Date / Time: 03/13/2014 14:46 (EDT) | |
| Supplier: QUALTECH NP | | Event Date / Time: 03/12/2014 16:00 (CDT) | |
| Last Modification: 03/13/2014 | | | |
| Region: 4 | Docket #: | | |
| City: KILONA | Agreement State: | | Yes |
| County: | License #: | | |
| State: LA | | | |
| NRC Notified by: JOHN JARRELL | Notifications: MARC FERDAS | R1DO | |
| HQ Ops Officer: DONG HWA PARK | KATHLEEN O'DONOHUE | R2DO | |
| Emergency Class: NON EMERGENCY | DAVE PASSEHL | R3DO | |
| 10 CFR Section: | THOMAS FARNHOLTZ | R4DO | |
| 21.21(d)(3)(i) DEFECTS AND NONCOMPLIANCE | PART 21 GROUP | EMAIL | |

PART 21 - ALLEN BRADLEY TYPE 700RTC RELAY SPURIOUSLY DE-ENERGIZING

"This is a non-emergency notification from Waterford 3 required under 10 CFR PART 21 concerning an apparent deviation from dedicated manufacturing specifications.

"On 10/17/2013, it was determined that there have been multiple inadvertent actuations of Engineered Safety Features Actuation Signal (ESFAS) equipment over the previous seven months. These equipment inadvertent actuations are occurring due to Allen Bradley type 700RTC relays spuriously de-energizing. The failure mode causes the relays to intermittently de-energize causing the associated equipment to perform its ESFAS function, not adversely impacting steady state plant operations.

"The failed relays have been sent to the qualifying vendor and two other failure analysis laboratories for testing. The results were reviewed by Waterford 3 engineers and although the failure mode could not be repeated in the laboratory, the laboratories identified less than adequate solder joints on the relay control circuit and a failed capacitor. The cause of the failed capacitor was identified as less than adequate installation practices during manufacturing. Engineering has determined that effects of these deviations, combined with installation in an application near the qualifying vendor's maximum specified environmental conditions, relevant to elevated voltage and ambient temperatures, has resulted in accelerated aging effects on the sub-components of the relays. The failures have been observed on relays that have been in-service greater than three years.

"Entergy concluded that for the applications for which the failure mode has been observed, and for other applications where these relays have been installed for more than 3 years, the failures did not result in a substantial safety hazard. However, on 3/12/2014, Entergy completed an evaluation concluding that, had this relay type been installed in other safety related normally energized applications for greater than 3 years, it could have resulted in a substantial safety hazard. Compensatory measures to preclude the malfunction of these relays, until

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long-term corrective actions are completed, have been implemented. As an interim measure the installed time for these relays is limited to 3 years or less, The Waterford 3 Site VP was informed the same day, 3/12/2014.

"Waterford 3 has determined that the only other Entergy nuclear facility utilizing these Allen Bradley relay types, possibly in a safety related application, is at James A. Fitzpatrick, to which this condition has been communicated."

The licensee has notified the NRC Resident Inspector.

**REACTOR PLANT
EVENT NOTIFICATION WORKSHEET**

U.S. NUCLEAR REGULATORY COMMISSION
OPERATIONS CENTER

EN #

NRC OPERATION TELEPHONE NUMBER: PRIMARY -- 301-816-5100 or 800-532-3469*, BACKUPS -- [1st] 301-851-0550 or 800-449-3694*, [2nd] 301-415-0550 and [3rd] 301-415-0553
*Licensees who maintain their own ETS are provided these telephone numbers.

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|-------------------|--|------------------|---------------------------------------|------------------------------------|
| NOTIFICATION TIME | FACILITY OR ORGANIZATION Waterford | UNIT 3 | NAME OF CALLER John Jarrell | CALL BACK # 504-739-6685 |
|-------------------|--|------------------|---------------------------------------|------------------------------------|

| | | | |
|--------------------------------------|---------------------------------|---|--|
| EVENT TIME & ZONE 1600 CDT | EVENT DATE 03/12/2014 | POWER/MODE BEFORE 100% / MODE 1 | POWER/MODE AFTER 100% / MODE 1 |
|--------------------------------------|---------------------------------|---|--|

| EVENT CLASSIFICATIONS | | 1-Hr. Non-Emergency 10 CFR 50.72(b)(1) | | | |
|--|--------------------|---|------|--|------|
| <input type="checkbox"/> GENERAL EMERGENCY | GEN/AAEC | <input type="checkbox"/> TS Deviation | ADEV | <input type="checkbox"/> (v)(A) Safe S/D Capability | AINA |
| <input type="checkbox"/> SITE AREA EMERGENCY | SIT/AAEC | 4-Hr. Non-Emergency 10 CFR 50.72(b)(2) | | <input type="checkbox"/> (v)(B) RHR Capability | AINB |
| <input type="checkbox"/> ALERT | ALE/AAEC | <input type="checkbox"/> (I) TS Required S/D | ASHU | <input type="checkbox"/> (v)(C) Control of Rad Release | AINC |
| <input type="checkbox"/> UNUSUAL EVENT | UNU/AAEC | <input type="checkbox"/> (iv)(A) ECCS Discharge to RCS | ACCS | <input type="checkbox"/> (v)(D) Accident Mitigation | AIND |
| <input type="checkbox"/> 50.72 NON-EMERGENCY | (see next columns) | <input type="checkbox"/> (iv)(B) RPS Actuation (scram) | ARPS | <input type="checkbox"/> (xI) Offsite Medical | AMED |
| <input type="checkbox"/> PHYSICAL SECURITY (73.71) | DDDD | <input type="checkbox"/> (xi) Offsite Notification | APRE | <input type="checkbox"/> (xii) Loss Comm/Asmt/Resp | ACOM |
| <input type="checkbox"/> MATERIAL EXPOSURE | B??? | 8-Hr. Non-Emergency 10 CFR 50.72(b)(3) | | 60-Day Optional 10 CFR 50.73(a)(1) | |
| <input type="checkbox"/> FITNESS FOR DUTY | HFIT | <input type="checkbox"/> (ii)(A) Degraded Condition | ADEG | <input type="checkbox"/> Invalid Specified System Actuation | AINV |
| <input checked="" type="checkbox"/> OTHER UNSPECIFIED REQMT. | (see last column) | <input type="checkbox"/> (ii)(B) Unanalyzed Condition | AUNA | Other Unspecified Requirement (Identify) | |
| <input type="checkbox"/> INFORMATION ONLY | NNF | <input type="checkbox"/> (iv)(A) Specified System Actuation | AESF | <input checked="" type="checkbox"/> 10 CFR 21.21(d)(3)(i) Defect | NONR |
| <input type="checkbox"/> NO (Explain above) | | | | | |

DESCRIPTION

This is a non-emergency notification from Waterford 3 required under 10 CFR PART 21 concerning an apparent deviation from dedicated manufacturing specifications.

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The failed relays have been sent to the qualifying vendor and two other failure analysis laboratories for testing. The results were reviewed by Waterford 3 engineers and although the failure mode could not be repeated in the laboratory, the laboratories identified less than adequate solder joints on the relay control circuit and a failed capacitor. The cause of the failed capacitor was identified as less than adequate installation practices during manufacturing. Engineering has determined that effects of these deviations, combined with installation in an application near the qualifying vendor's maximum specified environmental conditions, relevant to elevated voltage and ambient temperatures, has resulted in accelerated aging effects on the sub-components of the relays. The failures have been observed on relays that have been in-service greater than three years.

Entergy concluded that for the applications for which the failure mode has been observed, and for other applications where these relays have been installed for more than 3 years, the failures did not result in a substantial safety hazard. However, on 3/12/2014, Entergy completed an evaluation concluding that, had this relay type been installed in other safety related normally energized applications for greater than 3 years, it could have resulted in a substantial safety hazard. Compensatory measures to preclude the malfunction of these relays, until long-term corrective actions are completed, have been implemented. As an interim measure the installed time for these relays is limited to 3 years or less. The Waterford 3 Site VP was informed the same day, 3/12/2014.

Waterford 3 has determined that the only other Entergy nuclear facility utilizing these Allen Bradley relay types, possibly in a safety related application, is at James A. Fitzpatrick, to which this condition has been communicated.

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|---------------|-------------------------------------|-------------------------------------|--------------------------|---------------------------------------|---|
| NOTIFICATIONS | YES | NO | WILL BE | ANYTHING UNUSUAL OR NOT UNDERSTOOD? | <input type="checkbox"/> YES (Explain above) <input checked="" type="checkbox"/> NO |
| NRC RESIDENT | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| STATE | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | DID ALL SYSTEMS FUNCTION AS REQUIRED? | <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO (Explain above) |
| LOCAL | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | | |

ADDITIONAL INFORMATION

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| | | | | | | |
|--|---|--|--|------------------------------------|--|-----------|
| RADIOLOGICAL RELEASES: CHECK OR FILL IN APPLICABLE ITEMS (specific details/explanations should be covered in event description) | | | | | | |
| <input type="checkbox"/> LIQUID RELEASE | <input type="checkbox"/> GASEOUS RELEASE | <input type="checkbox"/> UNPLANNED RELEASE | <input type="checkbox"/> PLANNED RELEASE | <input type="checkbox"/> ONGOING | <input type="checkbox"/> TERMINATED | |
| <input type="checkbox"/> MONITORED | <input type="checkbox"/> UNMONITORED | <input type="checkbox"/> OFFSITE RELEASE | <input type="checkbox"/> T. S. EXCEEDED | <input type="checkbox"/> RM ALARMS | <input type="checkbox"/> AREAS EVACUATED | |
| <input type="checkbox"/> PERSONNEL EXPOSED OR CONTAMINATED | <input type="checkbox"/> OFFSITE PROTECTIVE ACTIONS RECOMMENDED | *State release path in description | | | | |
| | Release Rate (Ci/sec) | % T. S. LIMIT | HOO GUIDE | Total Activity (Ci) | % T. S. LIMIT | HOO GUIDE |
| Noble Gas | | | 0.1 Ci/sec | | | 1000 Ci |
| Iodine | | | 10 uCi/sec | | | 0.01 Ci |
| Particulate | | | 1 uCi/sec | | | 1 mCi |
| Liquid (excluding tritium and dissolved noble gases) | | | 10 uCi/min | | | 0.1 Ci |
| Liquid (tritium) | | | 0.2 Ci/min | | | 5 Ci |
| Total Activity | | | | | | |
| | PLANT STACK | CONDENSER/AIR EJECTOR | MAIN STEAM LINE | SG BLOWDOWN | OTHER | |
| RAD MONITOR READINGS | | | | | | |
| ALARM SETPOINTS | | | | | | |
| % T. S. LIMIT (if applicable) | | | | | | |
| RCS OR SG TUBE LEAKS: CHECK OR FILL IN APPLICABLE ITEMS: (specific details/explanations should be covered in event description) | | | | | | |
| LOCATION OF THE LEAK (e.g., SG #, valve, pipe, etc.) | | | | | | |
| LEAK RATE | UNITS: gpm/gpd | T. S. LIMITS | SUDDEN OR LONG-TERM DEVELOPMENT | | | |
| LEAK START DATE | TIME | COOLANT ACTIVITY AND UNITS: | PRIMARY | SECONDARY | | |
| LIST OF SAFETY RELATED EQUIPMENT NOT OPERATIONAL | | | | | | |
| EVENT DESCRIPTION (Continued from front) | | | | | | |

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|----------------------------|--------------------------|-------------------------------------|--------------------------|---|--|---|
| OTHER GOV AGENCIES | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | MODE OF OPERATION UNTIL CORRECTED: N/A | ESTIMATED RESTART DATE: N/A | ADDITIONAL INFO ON BACK <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO |
| MEDIA/PRESS RELEASE | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | | | |

NRC FORM 361 (12-2000)