

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

December 21, 1993

**NRC INFORMATION NOTICE 93-99: UNDERVOLTAGE RELAY AND THERMAL OVERLOAD
SETPOINT PROBLEMS**

Addressees

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

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to alert addressees to continuing discoveries of undervoltage relay and thermal overload setpoints that are set too low. 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 are not NRC requirements; therefore, no specific action or written response is required.

Background

In August 1976, the NRC wrote generic letters to all LWR licensees regarding the need for licensees to evaluate any generic implications of several events at the Millstone site involving episodes of sustained degraded grid voltage. On June 2, 1977, as part of multiplant action MPA-23, the staff stated its position that all licensees must have a second level of undervoltage protection with a time delay. (During degraded grid voltage episodes, undervoltage relays and thermal overload protective relays protect the safety equipment.) In a generic letter dated August 8, 1979, the NRC requested all licensees to determine the capability of the offsite power system to operate all required loads within their voltage ratings under all conditions within their design basis. The licensees reviewed their undervoltage relay setpoints on each of these occasions. In 1981, the NRC issued Branch Technical Position, Power System Branch-1, "Adequacy of Station Electric Distribution System Voltages," which discussed, among other things, the addition of a second undervoltage relay with an associated time delay. Between 1981 and 1992, the NRC issued two information notices, in which it discussed undervoltage relay setpoints and other concerns:

1. IN 84-02, "Operating a Nuclear Power Plant at Voltage Levels Lower than Analyzed," issued January 10, 1984.
2. IN 91-29, "Deficiencies Identified During Electrical Distribution System Functional Inspections," issued April 15, 1991.

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Notice

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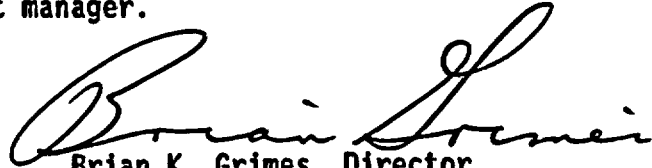
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3. IN 91-29, Supplement 1, "Deficiencies Identified During . . .

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Brian K. Grimes, Director
Division of Operating Reactor Support
Office of Nuclear Reactor Regulation

Technical contact: C. Morris, NRR
(301) 504-2778

Attachments:

1. Representative List of Undervoltage Relay Setpoint Revisions 1988-1993
2. List of Recently Issued NRC Information Notices

Representative List of Undervoltage Relay Set Point Revision Notifications and
 Technical Specification Change Proposals for 1988-1993

| <u>Event Notification Number</u> | <u>Licensee</u> | <u>Event Notification Date</u> | <u>Class</u> |
|--------------------------------------|-----------------------|--------------------------------|--------------|
| 11374 | Pilgrim 1 | January 30, 1988 | 1 |
| 14043 | Pilgrim 1 | November 18, 1988 | 5 |
| 00000 | Pilgrim 1 | June 30, 1988 | 1 |
| 14780 | Cooper 1 | February 17, 1989 | 5 |
| 16540 | Crystal River 3 | September 8, 1989 | 1 |
| 17121 | Robinson 2 | November 16, 1989 | 1 |
| 18322 | Oconee 1, 2 and 3 | April 24, 1990 | 5 |
| 18466 | McGuire 1 and 2 | May 14, 1990 | 1 |
| 18892 | St. Lucie 2 | July 14, 1990 | 2 |
| 19023 | Haddam Neck 1 | August 2, 1990 | 5 |
| 20021 | Calvert Cliff 1 and 2 | December 6, 1990 | 1 |
| 20435 | Ft. Calhoun | February 12, 1991 | 1 |
| 20503 | Kewaunee 1 | February 20, 1991 | 5 |
| 20542 | Salem 2 | February 27, 1991 | 2 |
| 21691 | Dresden 2 and 3 | August 23, 1991 | 5 |
| 22281 | Dresden 2 | November 20, 1991 | 1 |
| 22498 | Zion 1 and 2 | December 19, 1991 | 5 |
| 22580 | Indian Point 3 | January 9, 1992 | 5 |
| 22658 | Dresden 3 | January 22, 1992 | 5 |
| 22847 (TOL) | Washington Nuclear 2 | February 19, 1992 | 5 |
| 22918 | Washington Nuclear 2 | March 1, 1992 | 1 |
| 23148 | Vermont Yankee | April 1, 1992 | 4 |
| 23191 | Quad Cities 1 and 2 | April 7, 1992 | 5 |
| 23338 | LaSalle 1 and 2 | April 27, 1992 | 1 |
| 23365 | LaSalle 2 | April 29, 1992 | 1 |
| 23385 | Crystal River 3 | May 1, 1992 | 5 |
| 23439 (TOL) | Grand Gulf | May 11, 1992 | 3 |
| 23452 | Comanche Peak 2 | May 13, 1992 | 1 |
| 23576 | Crystal River 3 | June 4, 1992 | 1 |
| 23784 | Zion 1 and 2 | July 2, 1992 | 5 |
| 23932 | Byron 1 and 2 | July 24, 1992 | 1 |
| 00000 | Callaway | July 23, 1992 | 1 |
| 24229 | Crystal River 3 | September 14, 1992 | 1 |
| 24384 | Dresden 2 and 3 | October 6, 1992 | 5 |

*TOL = Thermal Overload

| <u>Event Notification Number</u> | <u>Licensee</u> | <u>Event Notification Date</u> | <u>Class</u> |
|--------------------------------------|-----------------------|--------------------------------|--------------|
| 00000 | Prairie Island 1 & 2 | November 6, 1992 | 1 |
| 00000 | St. Lucie 1 | November 30, 1992 | 1 |
| 24757 | Maine Yankee | December 15, 1992 | 5 |
| 00000 | Diablo Canyon 1 and 2 | December 22, 1992 | 1 |
| 24845 | Point Beach 1 and 2 | January 7, 1993 | 1 |
| 25248 (TOL) | Pilgrim | March 29, 1993 | 5 |
| 25362 | South Texas | April 6, 1993 | 5 |

Events Notification Number-00000 Licensees whose undervoltage relay setpoint notifications to the NRC were reported by LERs, licensee letter, etc., and event notification numbers if any, were not known.

Class Definitions:

1. Undervoltage Relay setpoints were found to be incorrect because of design errors.
2. Undervoltage Relay setpoints, as found, were not the same as required by the technical specification.
3. Safety load circuit breaker thermal overloads or other trip setpoints were too low because of design errors.
4. Safety load circuit breaker thermal overload, or other trip setpoints, as found, were not the same as required by the technical specification.
5. Membership in one of the preceding four classes could not be definitely established because of incomplete information in the event notification.

LIST OF RECENTLY ISSUED
 NRC INFORMATION NOTICES

| Information Notice No. | Subject | Date of Issuance | Issued to |
|------------------------|---|------------------|---|
| 93-98 | Motor Brakes on Valve Actuator Motors | 12/20/93 | All holders of OLs and CPs for nuclear power reactors. |
| 93-97 | Failures of Yokes Installed on Walworth Gate and Globe Valves | 12/17/93 | All holders of OLs or CPs for nuclear power reactors. |
| 93-96 | Improper Reset Causes Emergency Diesel Generator Failures | 12/14/93 | All holders of OLs or CPs for nuclear power reactors. |
| 93-95 | Storm-Related Loss of Offsite Power Events due to Salt Buildup on Switchyard Insulators | 12/13/93 | All holders of OLs or CPs for nuclear power reactors located close to a large body of salt water. |
| 93-94 | Unauthorized Forced Entry into the Protected Area at Three Mile Island Unit 1 on February 7, 1993 | 12/09/93 | All holders of OLs or CPs for nuclear power reactors. |
| 93-93 | Inadequate Control of Reactor Coolant System Conditions During Shutdown | 12/08/93 | All holders of OLs or CPs for nuclear power reactors. |
| 93-92 | Plant Improvements to Mitigate Common Dependencies in Component Cooling Water Systems | 12/07/93 | All holders of OLs or CPs for nuclear power reactors. |
| 91-21, Supp. 1 | Inadequate Quality Assurance Program of Vendor Supplying Safety-Related Equipment | 12/07/93 | All holders of OLs or CPs for nuclear power reactors and all recipients of NUREG-0040, "License Contractor and Vendor Inspection Status Report" (White Book). |

OL = Operating License
 CP = Construction Permit

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Original signed by
Brian K. Grimes

Brian K. Grimes, Director
Division of Operating Reactor Support
Office of Nuclear Reactor Regulation

Technical contact: C. Morris, NRR
(301) 504-2778

Attachments:

1. Representative List of Undervoltage Relay Setpoint Revisions 1988-1993
2. List of Recently Issued NRC Information Notices

Exception:

The stress laid by the initial reviewer on the degree of concern that licensees and the staff should feel for such a widespread and persistent problem, viz. low UVR set points, has been all but eliminated from the present IN.

*C.MORRIS (S/D) (SEE PREVIOUS CONC.)
15 NOV. 93

*SEE PREVIOUS CONCURRENCES

*DORS/OGCB * C/OGCB:DORS:NRR D/DORS:NRR
NCampbell GHMarcus
07/30/93 08/10/93


BKGrimes
12/15/93

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| *EELB:DE:NRR CMorris 04/28/93 | *SC/EELB:DE:NRR EWeiss 05/19/93 | *C/EELB:DE:NRR CHBerlinger 05/19/93 | *D/DE:NRR JTWiggins 07/23/93 | *RPB:ADM Tech Ed 07/13/93 |
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Concurred in electronically by JMain.
DOC NAME: 93-99.IN

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C.MORRIS
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| DORS/OGCB NCampbell 07/30/93 | D/DORS:NRR BKGrimes <i>JK</i> 08/ /93 | C/OGCB:DORS:NRR GHMarcus <i>GHM</i> 08/10/93 |
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Brian K. Grimes, Director
Division of Operational Events

Assessment

Office of Nuclear Reactor Regulation

Technical contact: C. Morris, NRR
(301) 504-2778

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J. E. Campbell
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