ATTACHMENT 2

MEMORANDUM TO: E. WEISS, S/C, EELB 03 NOV. 1993

FROM: C. MORRIS, EELB

IN RES: CONCURRENCE IN IN 93-XX: [UNDERVOLTAGE RELAY SETPOINT CHANGES]

Yesterday you returned to me the latest version of the subject information notice initialed by G. Marcus, B/C, OGCB and B. Grimes, D/D, DORS, et alii, together with a note saying, " Please review this and let me know if it is O.K. by you. Eric."

It is not, and not because I find any errors in the remaining text, but because my principle concern with the undervoltage relay set point problem, which I told you of, orally in March 1993, and in my memorandum to you of 19 April 1993, has been all but eliminated. Only the most experienced reader, the most curious and the most persistent, will be able to suspect its presence when he reads the version you returned to me for my O.K. The public will not.

Anticipating these spins and elisions, I am, after all, as you have often told me, an experienced reviewer, I had already diluted and tempered the substance of my concern, which I will again restate now, and only now, so as to avoid the anticlimactic.

My principle concern, when I reviewed the many examples of undervoltage relays set too low, was that they had continued for so long, and in so many plants, and despite repeated reviews by the licensee and his contractors, and by the NRC staff, continued to recur.

I pass over your reaction, then, to my observations, to come to my present concern. Calculating undervoltage setpoints should be within the competence of undergraduate electrical engineers. It appears not to be. Either then the licensee engineers are incompetent, and some NRC staff, or there are factors present of which I am unaware. Either way, an investigation is warranted. I proposed just such a task in my April 19th memorandum to you.

I do not expect you or the branch chief to agree with me. After all, W. Russell, A/D, ADT, found my remark about the persistence of so many improperly set undervoltage relays, namely that it was an awe-inspiring circumstance, inflammatory and inappropriate. He did not change his opinion when I insisted that it certainly was awe-inspiring and that something should be done. You are therefore politically correct and can rest easy.

9606180168 960618 PDR

To conclude, I could accept the present innocuous version of the subject IN, provided I could place on the concurrence page a sentence to the effect that while there is nothing to object to in what remains, there is much to object to in what does not. If this is too high a price for my concurrence, please remove my name from the concurrence page. I should of course be more than happy to remain as the technical contact.

C. Morris
EELB

ATTACHMENT 3

Setpoint is one word not set point!

major comment on a typo! And it's wrong.

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

NRC INFORMATION NOTICE 93-XXXX: UNDERVOLTAGE RELAY SETPOINT CHANGES

ADDRESSEES

All holders of operating licenses, or construction permits, ~~and vendors~~ for nuclear power plants.

PURPOSE

The U.S. Nuclear Regulatory Commission (NRC) is issuing this Information Notice (IN) to alert addressees to continuing discoveries of undervoltage relays (UVR) with setpoints too low. Other licensees have found thermal overloads (TOL), that are ~~too small~~ set too low. UVR and TOL protect safety loads during degraded grid voltage (DGV) episodes. setpoints

It is expected that recipients will review the information herein for applicability to their facilities, and consider actions to avoid similar problems. However, suggestions contained in this IN are not NRC requirements; therefore, no specific action or written response is required.

DESCRIPTION of CIRCUMSTANCES

Utilities have, in the last few years, initiated extensive efforts to improve the adequacy and completeness of the set of design bases, design analyses, and final design output documents that define the design of their facilities. The principal reason for these initiatives has been the consistent findings of NRC safety system functional inspections (SSFIs) and safety system outage modification inspections (SSOMIs) that some licensees have made ~~inappropriate~~ plant modifications which have affected the functionality of safety systems. ~~These modifications were made without the licensee having a firm understanding of the available design margins and the effect that the modifications have on these margins.~~ The NRC inspection findings prompted many licensees to review and reconstitute their design bases. Attachment 1 is a list of licensees who have discovered, since 1988, design deficiencies in their onsite electrical distribution system (EDS). As a result of earlier deficiencies, the NRC has developed the electrical distribution system ~~field~~ inspection (EDSFI), to evaluate the EDS. Since 1989, the NRC has performed over 50 EDSFIs, and has found design weaknesses in several areas including, UVR setpoints for DGV. Between May 1990 and January 1993, over 30 licensees have written to the NRC about changing UVR set points. They have found that the UVR setpoints were set so low that safety loads ~~have~~ not been protected ~~when~~ the grids ~~have~~ experienced DGVs.

could during functional

could have had

NOTE WE REFER TO THE LIST LATER ON

Find part of this pg also copied from (IN ?) *



three
An additional (3) licensees discovered a related deficiency in which the TOL ~~which were too small~~ protective relay setpoints were set too low.

DGV and UVR set points have been extensively reviewed before, beginning with each plant's initial EDS design. In August 1976, the NRC wrote generic letters to all LWR licensees concerning the need for licensee evaluation of potential generic implications of several Millstone events involving sustained degraded grid voltage episodes. ~~Following issue of the letters, licensees, among other actions, reviewed their UVR set points, as did the NRC.~~ On June 2, 1977, the staff, as part of multiplant action (MPA) MPA-23, stated the staff's position that all licensees must have a second level of under voltage protection with a time delay. On August 8, 1979, the NRC by generic letter, as part of MPA-48, 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. UVR setpoints were necessarily reviewed on each of these occasions. In 1981, the NRC issued Branch Technical Position, Power System Branch-1, which required, among other things, the addition of a second UVR with an associated time delay. ~~To implement the changes, again EDG UVR setpoints were reviewed by licensees and the NRC.~~

Between 1981 and 1990, two INs, which discussed UVR set points amongst other concerns, were issued by the NRC:

1. IN 84-02, "Operating a Nuclear Power Plant at Voltage Levels Lower than Analyzed," Jan. 10, 1984.
2. IN 91-29, Supplement 1, "Deficiencies Identified During Electrical System Functional Inspections," Sept. 14, 1992.

In addition, because some of the DGV problems occurred as a result of inadequate control over the design process, the NRC issued Generic Letter 88-15 on Sept. 12, 1988, entitled, "Electric Power Systems-Inadequate Control Over Design Processes."

For many years, the NRC has reviewed and approved ~~Occasional~~ Technical Specification changes concerning UVR setpoints, ~~have been submitted for many years to the NRC which has reviewed and approved them. Then, in 1990, as a result of the inspection findings and industry responses to them, a series of proposed revisions to UVR set points began which is continuing at present.~~ A partial list of these is attached. ~~(List)~~

These ~~which~~ have continued to be submitted and

NOTE: we only want supported statements in IN's

DISCUSSION

~~While no licensees are known to have experienced losses of equipment attributable to degraded grid voltage stresses, on occasions, safety loads have been exposed to sustained voltages below their ratings.~~ Many of the licensees analysing their UVR setpoints ~~are raising them after review. When doing so they~~ have raised them.

significant

5

The continuing need to raise UVR setpoints is of concern for two reasons

First, the NRC staff has given the issue substantial attention and yet the problem ~~has not lessened~~ persists. Second, the problem is ~~perhaps~~ indicative of inadequate design control.



~~should consider the increased risk of unnecessary trips with the attendant challenges to safety equipment. Licensees should also consider the reasons that the problems with inadequate EDS voltages and the associated UVR setpoint concerns have recurred at, and continue to recur for, so many licensees.~~

*This information notice requires no specific action or written response.*

~~Although it would be desirable to finally resolve these DGV and UVR set points concerns, licensees are reminded that nothing in this IN should be regarded as an NRC requirement; therefore, no specific action or written response is required. But licensees should be aware that if they have not reviewed their UVR setpoints, inadequacies may exist.~~ If you have any questions about the information in this notice, please contact the technical contact listed below or the appropriate NRR project manager.

Brian K. Grimes, Director
Division of Operational Events Assessment
Office of Nuclear Reactor Regulation

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

Attachments: ~~As stated~~
1. *Partial list of UVR setpoint revisions 1988-1993*
2. *List of Recently Issued NRC Information Notices*

*Note: The word "should" is not appropriate for an information notice*

*E. Weiss? Yes - all comments in ref - per EW*

*Block by C. Berlinger*

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ATTACHMENT 1

Partial List of UVR Set Point Revision Notification and Technical Specification Change Proposals for 1988-1993

| Event Notification Number | Licensee | Event Notification Date |
|---|---|---|
| 11374 | Pilgrim 1 | January 30, 1988 |
| 14043 | Pilgrim 1 | November 18, 1988 |
| 00000 | Pilgrim 1 | June 30, 1988 |
| 14780 | Cooper 1 | February 17, 1989 |
| 16540 | Crystal River 3 | September 8, 1989 |
| 17121 | Robinson 2 | November 16, 1989 |
| 18322 | Oconee 1,2 and 3 | April 24, 1990 |
| 18466 | McGuire 1 and 2 | May 14, 1990 |
| 18892 | St. Lucie 2 | July 14, 1990 |
| 19023 | Haddam Neck 1 | August 2, 1990 |
| 20021 | Calvert Cliff 1 and 2 | December 6, 1990 |
| 20435 | Ft. Calhoun | February 12, 1991 |
| 20503 | Kewaunee 1 | February 20, 1991 |
| 20542 | Salem 2 | February 27, 1991 |
| 21691 | Dresden 2 and 3 | August 23, 1991 |
| 22281 | Dresden 2 | November 20, 1991 |
| 22498 | Zion 1 and 2 | December 19, 1991 |
| 22534 | Haddam Neck 1 | December 27, 1991 |
| 22580 | Indian Point 3 | January 9, 1992 |
| 22658 | Dresden 3 | January 22, 1992 |
| 22847 (TOL) | Washington Nuclear 2 | February 19, 1992 |
| 22918 | Washington Nuclear 2 | March 1, 1992 |
| 23148 | Vermont Yankee | April 1, 1992 |
| 23191 | Quad Cities 1 and 2 | April 7, 1992 |
| 23338 | LaSalle 1 and 2 | April 27, 1992 |
| 23365 | LaSalle 2 | April 29, 1992 |
| 23385 | Crystal River 3 | May 1, 1992 |
| 23439 (TOL) | Grand Gulf | May 11, 1992 |
| 23452 | Comanche Peak 2 | May 13, 1992 |
| 23576 | Crystal River 3 | June 4, 1992 |
| 23764 | Zion 1 and 2 | July 2, 1992 |
| 23932 | Byron 1 and 2 | July 24, 1992 |
| 00000 | Callaway | July 23, 1992 |
| 24229 | Crystal River 3 | September 14, 1992 |
| 24384 | Dresden 2 and 3 | October 6, 1992 |

Attachment 1 ( continued )

| | | |
|---|---|---|
| 00000 | Prairie Island 1 & 2 | November 6, 1992 |
| 00000 | St. Lucie 1 | November 30, 1992 |
| 24757 | Maine Yankee | December 15, 1992 |
| 00000 | Diablo Canyon 1 and 2 | December 22, 1992 |
| 24845 | Point Beach 1 and 2 | January 7, 1993 |
| 22658 | Dresden 3 | January 22, 1993 |
| 25248 (TOL) | Pilgrim | March 29, 1993 |
| 25362 | South Texas | April 6, 1993 |

EEN numbered 00000 concern licensees whose UVR set point notifications to the NRC are carried by other files; e.g. LERS, licensee letter etc., and whose EN numbers, if any, are not known.

see pg 2

Comments by E Weiss
In fact, the Q is his

DISCUSSION

For many years the NRC has reviewed and approved Technical Specification changes concerning UVR setpoints. These have continued to be submitted and a partial list of these is attached. The continuing need to raise the UVR setpoints is of concern for two reasons. First, the NRC staff has given the issue substantial attention and yet the problem has persists. Second, the problem is perhaps indicative of inadequate control of the design process.

This information notice requires no specific action or written response. If you have questions about the information in this notice, please contact the technical contact listed below or the appropriate NRR project manager.

NOTES:

The statements using the word "should" are inappropriate for an information notice because the notice should not contain requirements.

Not! See many other IVs

The statement regarding "on occasions safety loads have been exposed to sustained voltages below their ratings" is unsupported conjecture.

If not true, IN is superfluous.

The main point of the conclusion is pervasiveness of the UVR setpoint problem and not how to find an acceptable UVR setpoint.

No comment needed; discuss must find UVR setpoint solution is the conclusion — or should find.

EW comments

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ATTACHMENT 4

IN-3 OORST
21 Dec 93
Issued, finally, by ORS

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.

3. IN 91-29, Supplement 1, "Deficiencies Identified During Electrical Distribution System Functional Inspections," issued September 14, 1992.

In addition, recognizing that certain degraded grid voltage problems resulted from inadequate control over the design process, on September 12, 1988, the NRC issued Generic Letter 88-15, entitled, "Electric Power Systems - Inadequate Control Over Design Processes."

Description of Circumstances

Since 1989, the NRC has performed electrical distribution system functional inspections at nuclear power plants. The NRC has found design weaknesses in several electrical distribution system areas including undervoltage relay setpoints for degraded grid voltage. These are addressed in IN 91-29 and in IN 91-29, Supplement 1. From May 1990 to January 1993, over 30 licensees wrote to the NRC about inadequate setpoints. Licensees found that the undervoltage relay setpoints were set so low that safety equipment would not have been protected if degraded grid voltage had occurred. Three licensees discovered deficiencies in which the thermal overload protective relay setpoints were set too low.

Discussion

In the last few years, licensees began extensive efforts to improve the adequacy and completeness of the set of design bases, design analyses, and final design output documents that define the design of their facilities. The licensees began these initiatives primarily because, during inspections such as safety system functional inspections and safety system outage modification inspections, the NRC consistently found that some licensees have made plant modifications which have affected the functionality of safety systems without making the appropriate setpoint change. The NRC inspection findings prompted many licensees to review and reconstitute their design bases.

These reviews and the generic communication documents discussed above prompted licensees to submit technical specification changes for undervoltage relay setpoints that were discovered to be incorrect after the problem was created for one of several reasons shown (see Attachment 1). Attachment 1 was developed from 50.72 reports as a representative summary of the types and number of problems encountered. Subsequent LERs may provide additional information. Of the reports where the cause could be determined based on the event report, design error was the predominant cause of the problem. Licensees have generally found setpoint problems when the setpoints were examined as a result of a special inspection or design basis reconstitution.

This information notice requires no specific action or written response. If you have any questions about the information in this notice, please contact the technical contact listed below or the appropriate Office of Nuclear Reactor Regulation (NRR) project manager.

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

| Event Notification Number | Licensee | Event Notification Date | Class |
|---|---|---|---|
| 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

| Event Notification Number | Licensee | Event Notification Date | Class |
|---|---|---|---|
| 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 |
| | Salem | Aug 20, 1993 | 1 |

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

ATTACHMENT 5



This information notice requires no specific action or written response. If you have any questions about the information in this notice, please contact the technical contact listed below or the appropriate Office of Nuclear Reactor Regulation (NRR) project manager.

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.*

CM
*C.MORRIS*
*15 NOV. 93*

Document Name: G:\SHARED\R3UNRELS.IN

*SEE PREVIOUS CONCURRENCES # Concurred in electronically by JMain.

| | | | | |
|---|---|---|---|---|
| | | D/DORS:NRR | *C/OGCB:DORS:NRR | *OGCB:DORS:NRR |
| | | BKGrimes | GHMarcus | NCampbell |
| | | 11/ /93 | 08/10/93 | 07/30/93 |
| *EELB:DE:NRR | *SC/EELB:DE:NRR | *C/EELB:DE:NRR | *D/DE:NRR | *RPB:ADM |
| CMorris | EWWeiss | CHBerlinger | JTWiggins | Tech Ed |
| 04/28/93 | 05/19/93 | 05/19/93 | 07/23/93 | 07/13/93 |

19 JAN 95 PRA LETTER