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The Northeast Utilities System

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NYN-94145

December 29, 1994

United States Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Document Control Desk

Reference: Facility Operating License No. NPF-86, Docket No. 50-443

Subject: Licensee Event Report (LER) No. 94-016-01: "Non-Compliance with Technical Specification 3.3.2 Action Requirements"

Gentlemen:

Enclosed please find supplemental Licensee Event Report (LER) No. 94-016-01 for Seabrook Station. This submittal reflects additional corrective actions and provides information on previous occurrences.

Should you require further information regarding this matter, please contact Mr. James M. Peschel, Regulatory Compliance Manager, at (603) 474-9521, extension 3772.

Very truly yours,

Ted C. Feigenbaum

TCF:JRM/act

Enclosures: NRC Forms 366, 366A

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NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Seabrook Station	05000443	1 OF 8

TITLE (4)
Non-Compliance with Technical Specification 3.3.2 Action Requirements

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
10	19	94	94	-- 16 --	01	12	29	94		05000
									FACILITY NAME	DOCKET NUMBER 05000

OPERATING MODE (9)	1
POWER LEVEL (10)	100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

	20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)
	20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)
	20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER
	20.405(a)(1)(iii)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		(Specify in Abstract below and in Text, NRC Form 366A)
	20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)		
	20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Mr. James M. Peschel, Regulatory Compliance Manager	(603) 474-9521 ext. 3772

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
	YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

During the process of implementing the corrective actions for a Station Information Report (SIR) concerns were raised over compliance with Technical Specification action requirements associated with the undervoltage (UV) protection circuitry for the station's 4160VAC emergency busses {EB}.

Since December 1988, when Seabrook Station initially entered MODE 4, surveillance procedures MX0513.06 and MX0513.07 have been performed monthly to satisfy the Trip Actuating Device Operational Test (TADOT) surveillance requirements of Technical Specification 4.3.2.1.

The performance of those procedures resulted in both channels of either the first or second levels of UV protection associated with one emergency bus being rendered simultaneously inoperable for brief periods of time during the performance of surveillance testing. The OPERABILITY requirements of 3.3.2, Table 3.3-3, Functional Units 9a and 9b were not satisfied during those instances and the plant was operated in a condition prohibited by the Technical Specifications.

There were no adverse safety consequences associated with this event. At least one emergency bus was available at all times to provide power to equipment necessary for safe shutdown of the plant.

The root cause of this event was determined to be the acceptance of inappropriate Technical Specification requirements regarding emergency bus UV protection.

I. System Description

Emergency busses E5 and E6 provide power to safety related equipment necessary for safe shutdown of the plant under accident conditions. Should the normal and backup power sources for these busses become unavailable or degraded, the undervoltage (UV) protection actuates to transfer these busses to the emergency power supply provided by the diesel generators.

Two levels of undervoltage protection are provided for busses E5 and E6; **Loss of Voltage** (first level) and **Degraded Voltage** (second level).

The schemes used for each level of protection are similar. Each level contains two protection channels that consist of two separate UV relays. These relays (designated as "27" relays) are connected (through a potential transformer) to the bus and are energized when bus voltage is above a predetermined setpoint and deenergized when bus voltage drops below the setpoint. When both of the "27" relays sense an undervoltage condition and deenergize, their associated contacts are configured so that a time delay relay (designated as "62" relay) operates. Automatic bus transfer to the emergency diesel generator supply is initiated when the "62" time delay relay times out and its contacts allow for other component actuation.

II. Background

In December 1993, an Electrical Maintenance supervisor suggested enhancements to the surveillance procedure (MX0513.06) that was written to comply with the monthly Trip Actuating Device Operational Test (TADOT) surveillance requirements of Technical Specification 4.3.2.1, Table 4.3-2, Functional Unit 9.a.

The proposed enhancements to that procedure resulted in a review that questioned the method used to test the UV circuitry. Specifically, the test method included relay test jacks that isolated the "27" undervoltage relays within the UV circuitry and allowed for setpoint verification/adjustment.

The review focused on the condition of the two protection channels during the period of time when normal relay jacks were being exchanged for test relay jacks. The review determined that, even though personnel involved in the UV surveillance testing understood that exchanging relay jacks rendered both channels of the first level of UV protection inoperable, the procedure did not detail this condition, and hence, there was no guidance to enter an appropriate Technical Specification Action statement. This failure to enter an appropriate Action statement was documented in Station Information Report (SIR) 93-109 in December 1993.

The evaluation of SIR 93-109 determined that the appropriate action for the inoperable condition described above was to enter Action 18 of Table 3.3-3 associated with LCO 3.3.2. The evaluation further stated that the station was not in violation of Technical Specification requirements since the 2 hour time limit imposed by ACTION 18 was never exceeded.

During the implementation of corrective actions for SIR 93-109 concerns were raised as to whether or not ACTION 18 of Table 3.3-3 was applicable to the inoperable conditions created during the performance of the surveillance procedure. Another SIR (94-91) was written on October 19, 1994 to address this issue.

III. Description of Event

Evaluations performed to date for SIR 94-91 have included a detailed examination of the UV protection circuitry for emergency busses E5 and E6; the Technical Specification OPERABILITY requirements for that protection; and the applicable surveillance test procedures used to comply with those OPERABILITY requirements.

Technical Specification 4.3.2.1 requires that the UV protection functions be demonstrated OPERABLE per the surveillance tests specified in Table 4.3-2, Functional Units 9a and 9b. The required surveillance tests are a monthly TADOT to be performed while in MODES 1, 2, 3, and 4.

Technical Specification 1.39 defines a TADOT as follows:

> A TRIP ACTUATING DEVICE OPERATIONAL TEST shall consist of operating the Trip Actuating Device and verifying OPERABILITY of alarm, interlock and/or trip functions. The TRIP ACTUATING DEVICE OPERATIONAL TEST shall include adjustment, as necessary, of the Trip Actuating Device such that it actuates at the required Setpoint within the required accuracy.

Since the UV protection circuitry includes many components, in the Fall of 1988, personnel responsible for implementing required testing requested clarification of the TADOT definition as it applied to the undervoltage protection circuitry

On November 9, 1988, Technical Clarification TS-059 was issued specifying that relays 27B1, 27B2, and 62B were to be included in the **Loss of Voltage** (LOV) TADOT and that relays 27D1, 27D2, and 62D were to be included in the **Degraded Voltage** TADOT.

Surveillance procedures for the **LOV** and the **Degraded Voltage** protection functions were written in accordance with TS-059.

The **LOV** procedure used test switches (TS-3 and TS-4) in conjunction with a special relay test jack to verify proper operation of UV relays 27B1, 27B2, and time delay relay 62B. The relay test jack allowed for in situ 27B relay undervoltage setpoint verification/calibration. Test Switch TS-3 was used to electrically disconnect each 27B relay from the E bus one at a time so that proper response of the corresponding relay contacts could be verified. Test Switch TS-4 was then used to first block the output circuits of the 62B relay, and second, to energize the 62B relay coil to facilitate verification/calibration of proper time delay.

The **Degraded Voltage** procedure (MX0513.07) used test switches (TS-1 and TS-2) and a bench test rig to verify proper operation of UV relays 27D1, 27D2 and time delay relay 62D. Unlike the **LOV** procedure, the UV relays were not tested in situ for setpoint verification/calibration but were extracted from their case (after installing jumpers in the circuitry) and tested on a bench test rig. A special relay test jack was not used. After setpoint verification bench testing, the 27D relays were reinstalled in their case, (jumpers were removed) and testing proceeded similar to that conducted in the **LOV** procedure. Test Switch TS-1 disconnected each 27D relay from the E bus one at a time and test switch TS-2 facilitated 62D time delay relay testing.

A study of the two UV surveillance procedures and the associated electrical schematic diagrams (M310102) has shown that as each procedure was performed, both corresponding undervoltage channels (27B1 and 27B2 for **LOV**, 27D1 and 27D2 for **Degraded voltage**) were made inoperable simultaneously. In the case of the **LOV** procedure, whenever the 27B relay jacks are swapped and whenever Test Switch TS-4 is taken out of the "OFF" position, both 27B channels become inoperable. In the case of the **Degraded Voltage** procedure, whenever Test Switch TS-2 is taken out of the "OFF" position both 27D channels become inoperable.

Technical Specification 3.3.2, Table 3.3-3, Action 18 reads as follows:

> With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:
>
> a. The inoperable channel is placed in the tripped condition within 1 hour, and
>
> b. The Minimum Channels OPERABLE requirement is met; however, one additional channel may be bypassed for up to 2 hours for surveillance testing of other channels per Specification 4.3.2.1.

The first level UV protection scheme contains a total of 2 channels, 27B1 and 27B2. The second level uv protection scheme also contains a total of 2 channels, 27D1 and 27D2. Each time the surveillance procedure for the **LOV** protection was performed, both channels 27B1 and 27B2 would become simultaneously inoperable. Also, whenever the surveillance procedure for the **Degraded Voltage** protection was performed, both channels 27D1 and 27D2 would become simultaneously inoperable.

In these instances the requirements of Action 18 were not met. According to the first sentence of Action 18, power operation can continue only if at least one of the 2 total channels are OPERABLE, (the total number of channels being 2; one less requires 1 channel to be OPERABLE).

During those instances described above, this condition is clearly not met since there are **no** channels (i.e. two less than the total) that can be considered OPERABLE. The entire protection afforded by the UV schemes is not available and STARTUP and/or POWER OPERATION is prohibited. The conditions for continued power operation specified in sentences 18a and 18b that follow the initial requirement are not applicable.

Action 18 appears to have been written for protective functions where more than two channels exist, e.g., Steam Generator Level and RWST level each have four channels. If a steam generator level or RWST level channel is inoperable and in the tripped condition and another channel is bypassed for testing, the protective function remains available through the two remaining OPERABLE channels. In the case of the UV functions where only two UV channels exist, Actions 18a and 18b could only apply in the instance where one of the channels becomes inoperable while the other channel remains OPERABLE. This situation would satisfy the minimum number of channels OPERABLE requirement (one is the minimum number for each UV function) and would allow for continuing POWER OPERATION indefinitely with the inoperable channel tripped. Should surveillance testing of the lone OPERABLE channel become necessary, Action 18b permits this "bypass"/testing condition for up to 2 hours, but after that time period the minimum OPERABLE channel requirement must be satisfied, i.e. one channel must be OPERABLE. However, it is important to distinguish that the condition of having 1 channel inoperable/tripped and one channel in bypass for testing, is very different than a condition where all channels are rendered inoperable simultaneously, although the effect is the same, the latter condition is not allowed by Action 18.

The scenario described above represents a potential 2 hour period of time where an UV protection function would be unavailable to perform its intended safety function. This 2 hour period is short in comparison to the 72 hour time period that an Emergency Diesel Generator (EDG) is allowed to be inoperable or the 8 hour period of time where an emergency bus is allowed to be inoperable. In light of these OPERABILITY requirements it would appear that the events described above do not constitute a significant threat to nuclear safety since the instances of UV channel inoperability were brief.

From the above assessment it can be concluded that during those brief instances of simultaneous total channel inoperability that occurred while performing both the **LOV** and **Degraded Voltage** surveillance procedures, the requirements of LCO 3.3.2, Table 3.3-3, Functional Units 9a and 9b were not satisfied. The station was therefore not in compliance with Technical Specification requirements and should therefore have taken action to place the plant in a MODE where LCO 3.3.2 did not apply, i.e. actions specified in LCO 3.0.3.

IV. Safety Consequences

There were no adverse safety consequences associated with this event. The periods of undervoltage protection channel inoperability were brief, in all instances less than two hours.

In comparison to the 72 hour allowed period of time for an inoperable Emergency Diesel Generator or the 8 hour period of time allowed for an inoperable emergency bus, there is minor safety significance associated with this event. Further, under all conditions described, at least one emergency bus was available to provide power for safe shutdown of the plant.

V. Event Date/Discovery Date/Report Date

The event(s) related to LER 94-016 occurred upon each performance of the LOV and Degraded Voltage surveillance tests during MODES 1, 2, 3, and 4 from the initial entry into MODE 4 in December 1988 until October 1994. The

event date, discovery date and reporting date were determined utilizing the guidance of NUREG 1022, Supplement No. 1, License Event Report System. The discovery date was determined to be the date that SIR 94-091 was initiated, October 19, 1994, to address the questions regarding the appropriateness of entering Action 18 of Table 3.3-2, not the initial discussion of not entering an Action statement which is in and of itself not reportable. The reporting date was then determined to be November 21, 1994 based upon the determination that the interpretation of Action 18 was not correct and that the testing as performed created a condition prohibited by the Technical Specifications.

VI. Cause of the Event

The root cause of this event was determined to be the acceptance of inappropriate Technical Specification requirements regarding emergency bus UV protection. A contributing cause of the event was the misinterpretation, until October 1994, of Technical Specification 3.3.2, Table 3.3-3, Action 18 as it applied to the UV protection functions.

VII. Corrective Actions

The following corrective actions have been or will be taken:

1. Technical Clarification TS-059 has been revised so that the requirement to test the 62 time delay relays in the monthly TADOTs for both levels of undervoltage protection has been deleted. The 62 time delay relays are not considered to be part of the UV protection channels according to the definition of "channel" as set forth by IEEE STD 279-1971. These relays, therefore, are not subject to the monthly TADOT surveillances. Time delay relay testing is accomplished every 18 months when the 4160VAC 18 month surveillance and relay testing procedures (LX0563.61 and LX0563.62) are performed.

2. The applicable UV Technical Specification TADOT surveillance procedures have been revised to delete 62 relay testing and have incorporated changes so that their performance no longer makes both channels for each level of protection inoperable. Inappropriate entrance into a Technical Specification Action statement during routine surveillance testing has therefore been precluded.

3. North Atlantic will initiate a License Amendment Request for the purpose of clarifying Table 3.3-3, Functional Units 9a and 9b, and Action 18.

4. North Atlantic is in the process of developing a design change to modify the undervoltage relay cases where appropriate to enhance testing capability.

5. North Atlantic had previously initiated the Procedure Upgrade Program (PUP). This is a substantial, resource intensive initiative that will improve the quality and accuracy of procedures. Initial planning for PUP began in the fall of 1993, and the program is currently undergoing pilot testing and will be fully implemented in January 1995. The PUP will specifically include a review of safety significant surveillance procedures for conformance with the Technical Specifications and the plant design.

   The procedure review will be prioritized according to the following attributes:

   - Nuclear and personnel safety significance.
   - Complexity of the procedure.
   - Frequency of performance.
   - Consequences of error while performing the procedure.
   - Amount of negative feedback from the end users.
   - History of problems with the procedures.

6. North Atlantic will also revise the PUP program documents to clearly delineate where Engineering resources will be utilized in the review process.

7. North Atlantic will continue to implement the Corrective Action Program with the current low threshold level to ensure that appropriate items are reported to management. North Atlantic Managers, at the Group Manager level will be held accountable for ensuring that items are reported in a timely manner and for ensuring that significant corrective action documents are completed in a timely manner.

8. North Atlantic will also revise the Corrective Action Program. The Occurrence Review Committee (ORC) will be restructured to create an ORC with more technical skills. The ORC will meet daily, or as required, to review Corrective Action Documents and determine which documents are significant. The significant items will receive detailed review and analyses, while the lesser items will be trended by the ORC. ORC will ensure significant issues are evaluated in a timely manner by setting the appropriate priority, similar to that used for work requests. ORC will also utilize trending to identify reoccurring events that may require further evaluation. Additionally, ORC will review proposed corrective actions contained in draft evaluations to ensure that they are appropriate.

VIII. Plant Conditions

The plant was in Mode 1 at 100% power when the conflict with Technical Specification 3.3.2 was identified.

IX. Previous Occurrences

NUREG-1022 Supplement 1 and NUREG-1022, Revision 1 (Second Draft) provides guidance regarding the reporting of previous occurrences. North Atlantic has utilized this guidance in its determination of the previous occurrences which relate to this event.

Numerous previous occurrences relating to non-compliance with Technical Specifications have been identified and reported to the NRC in previous LERs. Three previous occurrences are related to this event in that the occurrences have a common root cause (eg. the inappropriate acceptance of Technical Specification requirements). Those instances are described in LERs 92-02, 92-11 and 93-15.