Maine Yankee

RELIABLE ELECTRICITY FOR MAINE SINCE 1972

EDISON DRIVE • AUGUSTA, MAINE 04336 • (207) 622-4868

10 CFR 50.73

September 7, 1990
MN-90-87   SEN-90-252

UNITED STATES NUCLEAR REGULATORY COMMISSION
Attention: Document Control Desk
Washington, D. C. 20555

References: (a) License No. DPR-36 (Docket No. 50-309)

Subject: Maine Yankee Licensee Event Report 90-002-01 - Inadvertent SIAS While
          Swapping Vital AC Busses

Gentlemen:

Please find enclosed Maine Yankee Licensee Event Report 90-002-01. This report
is submitted in accordance with the requirements of 10 CFR 50.73(a)(2)(iv).

Please contact us should you have any questions regarding this matter.

Very truly yours,

S. E. Nichols
Licensing Section Head

SEN:SJJ

Enclosure

c: Mr. Thomas T. Martin
    Mr. Eric J. Leeds
    Mr. Charles S. Marschall
    Mr. Patrick J. Dostie

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NRC Form 366
(9-83)

U.S. Nuclear Regulatory Commission
Approved OMB No. 3150-0104
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LICENSEE EVENT REPORT (LER)

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Title(4)

Inadvertent SIAS While Swapping Vital AC Busses

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 Names	Docket Number(s)
04	14	90	90	0 0 2	0 1	05	16	90		

Operating Mode (9)	1
Power Level (10)	0 0 0

This Report is Submitted Pursuant to the Requirements of 10 CFR § (Check one or more of the following) (11)

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

LICENSEE CONTACT FOR THIS LER (12)

NAME	Telephone Number
	Area Code
Rodney R. Dee, Senior Nuclear Safety Engineer	2 0 7 8 8 2 6 3 2 1

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 fifteen single-space typewritten lines) (16)

On April 14, 1990 while in a refueling shutdown condition, an inadvertent actuation of Engineered Safeguard Features occurred. While returning an inverter to service, operators incorrectly opened the output breaker of an operating inverter. This inverter was supplying power to its own bus as well as alternate power for the inverter which had been out of service. Opening the output breaker caused a loss of power to the two AC busses connected to it. Due to the failsafe design of the Safety Injection Actuation (SIAS) logic, the system actuated upon loss of power to two channels.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

At 2307 on April 14, 1990, while in a refueling shutdown condition, an inadvertent actuation of safeguard systems occurred. The 120 volt AC vital (EF) busses (BU) #1 and #4 were being powered from inverter #1 (INVT) to allow maintenance on inverter #4. See attached diagram. While returning the #4 inverter to service, a licensed operator incorrectly opened the normal supply breaker (BKR) for bus 1. This action simultaneously de-energized both vital AC busses #1 and #4. Both trains of Safety Injection (JE) actuated at the instant both vital busses were de-energized. There were no significant adverse effects on plant operation since the plant was in a refueling shutdown condition with the affected safety systems secured. Inverter #1 was returned to service and the safeguard signals were reset.

It was immediately determined that the wrong breaker had been opened and was the cause of the inadvertent safeguard actuation. As the diagram indicates, AC vital busses #1 and #4 can be cross-tied to either inverter #1 or #4. The cross-tie is accomplished by a set of mechanically interlocked breakers that require disconnecting the vital bus from one source before connecting to the new source. Power for bus #4 was being supplied through the normally open feeder breaker from inverter #1. The procedure directed the opening of the alternate feeder breaker on bus #4 to intentionally de-energize it prior to closing in its normal feeder breaker from inverter #4. The licensed operator incorrectly opened the normal feeder breaker from inverter #1, simultaneously de-energizing both vital bus #1 and #4.

Due to the fail-safe design of the Engineered Safeguard Feature logic, the loss of power to busses #1 and #4 caused two of the four pressurizer (PZR) pressure channels to de-energize and automatically unblock the associated Safety Injection channels. This satisfied the logic for actuation of Safety Injection Actuation Signal (SIAS) on low pressurizer pressure.

Prior to the occurrence, reactor vessel level had been lowered to six inches below the vessel flange in preparation of reactor head removal. Due to concerns of operating at reduced inventory while on Residual Heat Removal (BP) (RHR), an operable, manual make-up path from the Refueling Water Storage Tank (RWST) to the Reactor Coolant System (AB) (RCS) via the High Pressure Safety Injection (BQ) (HPSI) System was established. All HPSI pumps were in Pull To Lock. Upon actuation of the SIAS logic, automatic valves realigned as designed and allowed a flowpath from the RWST to the RCS by gravity feed. Approximately 400 gallons of borated water was transferred to the RCS, increasing vessel level to two inches below the vessel flange. No water overflowed the vessel. The gravity feed was stopped by operator action to bypass the SIAS signal and close the HPSI header isolation valves.

The cause of the inadvertent SIAS was quickly determined, the busses re-energized, and SIAS reset using available procedures. The RHR mode of core cooling was maintained throughout the event.

The SIAS also caused a loss of power to portions of the security access system due to a load shedding sequence associated with the safety injection signal. The items affected include the entrance turnstile, X-ray machine, and explosives detector. All of these entrance process devices can be backed up by manual operations. Security personnel immediately compensated for the loss, negating any potentially adverse effects.

An initial review of the procedures and conditions associated with the inappropriate action identified a weakness in the labeling scheme utilized on the vital bus transfer panels. As an immediate corrective action, the labeling was changed to aid operator identification and indicate the purpose of each breaker on the vital bus transfer panels. Maine Yankee is currently implementing a program to upgrade the labeling on plant components and will provide permanent human factored labeling on the affected transfer panels. Additionally, a root cause evaluation is being performed by the Operations Department.

A similar inadvertent SIAS event was previously reported in LER 84-007.

NRC Form 366A
(9-83)

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

LOW VOLTAGE ELECTRICAL SYSTEM
(PARTIAL FIGURE)

FROM
BATTERY
BUS 1

FROM
BATTERY
BUS 4

IN-1

IN-4

MECHANICAL INTERLOCK
(BOTH BREAKERS CANNOT
BE CLOSED SIMULTANEOUSLY)

1A

1

4A

4

TO
LOADS

TO
LOADS

N.O.
(NORMALLY OPEN)

TO
LOADS

TO
LOADS

N.O.