

# New Hampshire Yankee

Ted C. Feigenbaum  
President and  
Chief Executive Officer

NYN-91013

January 30, 1991

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

Attention: Document Control Desk

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


Subject: License Event Report (LER) No. 87-006-01: ESF Actuation - Loss of  
Power to Vital Instrument Panel

Gentlemen:

Enclosed please find Licensee Event Report (LER) No. 87-006-01 for Seabrook Station. This submittal supplements LER 87-006-00 which documents an event which occurred on February 19, 1987, and is being reported pursuant to 10CFR50.73(a)(2)(iv).

Should you require further information regarding this matter, please contact Mr. Allen L. Legendre, Lead Engineer - Compliance, at (603) 474-9521, extension 2373.

Very truly yours,

  
Ted C. Feigenbaum

Enclosures: NRC Forms 366, 366A

TCF:WJT/ssl

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United States Nuclear Regulatory Commission  
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cc: Mr. Thomas T. Martin  
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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Seabrook Station	DOCKET NUMBER (2) 0 5 0 0 0 4 4 3	PAGE (3) 1 OF 0 3
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TITLE (4)  
ESF Actuation-Loss of Power to Vital Instrument Panel

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)
0 2	1 9	8 7	8 7	0 0 6	0 1	0 1	3	0 9			0 5 0 0 0
											0 5 0 0 0

OPERATING MODE (9) 3

POWER LEVEL (10) 0 1 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following) (11)

<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 72.71(b)
<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(e)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 72.71(e)
<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.36(e)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	
<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME Allen L. Legendre Jr., Lead Engineer - Compliance, Ext. 2373	TELEPHONE NUMBER AREA CODE 6 0 3 4 7 4 - 9 5 2 1
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	USE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC
1	E F	I N V E R T E R	E 2 0 9	N					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)  NO

EXPECTED SUBMISSION DATE (15)

MONTH	DAY	YEAR

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

On February 19, 1987, at 3:20 am EST, while Seabrook Station was in Mode 3, several alarms were received indicating a ground. In attempt to identify the source of the ground, which appeared to originate from Uninterruptible Power Supply 1E, the supply from DC Bus 11A was verified to be the supplying source to Vital Instrument Panel 1E through the inverter. The AC supply breaker to UPS 1E from Motor Control Center E512 was then opened which resulted in the inverter output being interrupted for approximately 2 seconds. This loss of power resulted in multiple ESF actuations: i.e., isolation of the non-nuclear safety portions of the Primary Component Cooling Water System, actuation of the Control Room Emergency Clean-up Filter System, and isolation of the Containment Ventilation System. All ESF systems functioned as designed.

The root cause was determined to be the activation of the UPS 1E transducer board DC undervoltage optical isolator by extraneous plant electrical noise caused by an intermittent AC system ground. The DC undervoltage isolator in turn activated the fault protection circuitry which initiated the two second output interruption. A design change was implemented to change the value of the bias resistors and reduce the sensitivity of all the UPS DC undervoltage optical isolators.

This is the first occurrence of this type at Seabrook Station.

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		87	006	01	02	OF 03

TEXT (If more space is required, use additional NRC Form 305A's) (17)

Description of Event

On February 19, 1987, at 3:20 am EST, while Seabrook Station was in Mode 3, the following alarms were received in the control room: "Bus 51 Grounded", "Vital UPS 1E AC Supply Volts Low", "Vital UPS 1E DC Supply Volts Low", and "Vital UPS Supply on DC Bus". In an attempt to identify the source of the ground, which appeared to originate from Uninterruptible Power Supply (UPS) 1E (EDE-I-1E), the supply from DC Bus 11A (EDE-SWG-11A) was verified to be the supplying source to Vital Instrument Panel 1E (EDE-PP-1E) through the inverter (see attached figure for details). The AC supply breaker to UPS 1E from Motor Control Center (MCC) E512 (EDE-MCC-512) was then opened. When this breaker was opened, the inverter output was interrupted for approximately two (2) seconds. This momentary loss of power to Vital Instrument Panel 1E resulted in multiple ESF actuations: i.e., isolation of the non-nuclear safety portions of the Primary Component Cooling Water System, actuation of the Control Room Emergency Clean-up Filter System, and isolation of the Containment Ventilation System. Upon initiation, all ESF systems functioned as designed. When power was restored to the Vital Instrument Panel, normal system alignment was restored.

On February 25, 1987, at 3:55 pm EST, the same alarms were received; however, on this occasion the AC supply breaker was not opened. The ground was cleared and the inverter alarms were cleared and reset. There was no loss of inverter output at this time.

Safety Consequences

There were no adverse safety consequences as a result of this event. All equipment operated as designed fulfilling the Engineered Safety Features (ESF) function. At no time during this event was there any impact on the health and safety of the public.

Root Cause

Special Test Procedure ES 87-1-32 was developed to troubleshoot and test UPS 1E and UPS 1F. It was determined that the UPS 1E DC undervoltage optical isolator was activated by extraneous plant electrical noise caused by an intermittent AC system ground. The physical configuration of electrical equipment for UPS 1E apparently allowed sufficient electrical noise to be generated to activate the DC undervoltage circuitry and in turn initiate the two second fault protection output interruption. It was determined through testing that UPS 1F did not experience similar electrical noise generation. The vendor was involved in the troubleshooting and testing activities and concurred with the conclusions.

Corrective Actions

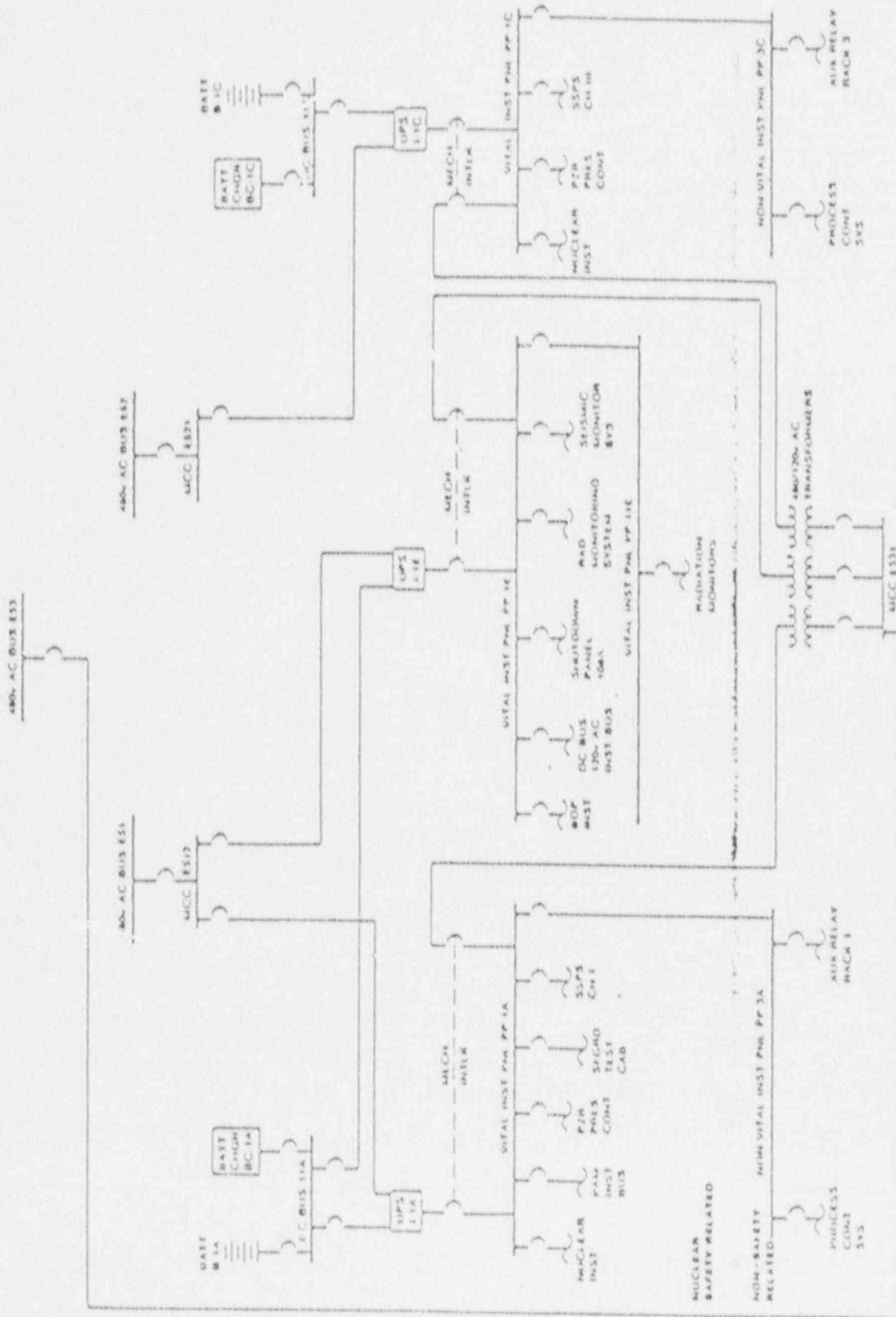
A design change was implemented to reduce the sensitivity level of the UPS 1E and 1F DC undervoltage optical isolators by changing the value of the bias resistors. This change makes the transducer board less susceptible to spurious noise signals. Subsequent to the implementation of the design change, an AC supply ground test (ES 87-1-32) was performed on both UPS 1E and UPS 1F with no loss of output experienced.

This is the first occurrence of this type at Seabrook Station.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)		DOCKET NUMBER (2)		LER NUMBER (6)			PAGE (3)	
Seabrook Station		05000443817		006	011	03	OF	03
YEAR	SEQUENTIAL NUMBER	REVISION NUMBER						

TEXT (If more space is required, use additional NRC Form 365A (117))



A TRAIN 120V AC VITAL INSTRUMENTATION DISTRIBUTION SYSTEM