

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)  
**Turkey Point Unit 4**

DOCKET NUMBER (2)

0 5 0 0 0 2 5 1 1 OF 0 2

TITLE (4)

Reactor Protection System (RPS) Actuation - Reactor Trip

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	5	3	0	8	5	8	5	0	1	2	N/A	0 5 0 0 0
0	5	3	0	8	5	8	5	0	0	0	N/A	0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more of the following) (11)																				
POWER LEVEL (10)	1 1 0 1 0	<input checked="" type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 20.405(a)(1)(v)	<input checked="" type="checkbox"/> 20.406(c)	<input type="checkbox"/> 50.36(a)(1)	<input type="checkbox"/> 50.36(a)(2)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	<input type="checkbox"/> 50.73(a)(2)(x)	<input type="checkbox"/> 73.71(b)	<input type="checkbox"/> 73.71(c)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		<input type="checkbox"/> 20.406(a)(1)(i)	<input type="checkbox"/> 20.406(a)(1)(ii)	<input type="checkbox"/> 20.406(a)(1)(iii)	<input type="checkbox"/> 20.406(a)(1)(iv)	<input type="checkbox"/> 20.406(a)(1)(v)	<input type="checkbox"/> 20.406(c)	<input type="checkbox"/> 50.36(a)(1)	<input type="checkbox"/> 50.36(a)(2)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	<input type="checkbox"/> 50.73(a)(2)(x)	<input type="checkbox"/> 73.71(b)	<input type="checkbox"/> 73.71(c)		
		<input type="checkbox"/> 20.406(a)(1)(i)	<input type="checkbox"/> 20.406(a)(1)(ii)	<input type="checkbox"/> 20.406(a)(1)(iii)	<input type="checkbox"/> 20.406(a)(1)(iv)	<input type="checkbox"/> 20.406(a)(1)(v)	<input type="checkbox"/> 20.406(c)	<input type="checkbox"/> 50.36(a)(1)	<input type="checkbox"/> 50.36(a)(2)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	<input type="checkbox"/> 50.73(a)(2)(x)	<input type="checkbox"/> 73.71(b)	<input type="checkbox"/> 73.71(c)		
		<input type="checkbox"/> 20.406(a)(1)(i)	<input type="checkbox"/> 20.406(a)(1)(ii)	<input type="checkbox"/> 20.406(a)(1)(iii)	<input type="checkbox"/> 20.406(a)(1)(iv)	<input type="checkbox"/> 20.406(a)(1)(v)	<input type="checkbox"/> 20.406(c)	<input type="checkbox"/> 50.36(a)(1)	<input type="checkbox"/> 50.36(a)(2)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	<input type="checkbox"/> 50.73(a)(2)(x)	<input type="checkbox"/> 73.71(b)	<input type="checkbox"/> 73.71(c)		
		<input type="checkbox"/> 20.406(a)(1)(i)	<input type="checkbox"/> 20.406(a)(1)(ii)	<input type="checkbox"/> 20.406(a)(1)(iii)	<input type="checkbox"/> 20.406(a)(1)(iv)	<input type="checkbox"/> 20.406(a)(1)(v)	<input type="checkbox"/> 20.406(c)	<input type="checkbox"/> 50.36(a)(1)	<input type="checkbox"/> 50.36(a)(2)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	<input type="checkbox"/> 50.73(a)(2)(x)	<input type="checkbox"/> 73.71(b)	<input type="checkbox"/> 73.71(c)		
		<input type="checkbox"/> 20.406(a)(1)(i)	<input type="checkbox"/> 20.406(a)(1)(ii)	<input type="checkbox"/> 20.406(a)(1)(iii)	<input type="checkbox"/> 20.406(a)(1)(iv)	<input type="checkbox"/> 20.406(a)(1)(v)	<input type="checkbox"/> 20.406(c)	<input type="checkbox"/> 50.36(a)(1)	<input type="checkbox"/> 50.36(a)(2)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	<input type="checkbox"/> 50.73(a)(2)(x)	<input type="checkbox"/> 73.71(b)	<input type="checkbox"/> 73.71(c)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
R. L. Teuteberg, Regulation and Compliance Engineer	3 0 5 2 4 5 1 - 2 9 1 1 0

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDs	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDs
X	EIF	FIUL	S 111516	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input checked="" type="checkbox"/>	<input type="checkbox"/>				

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

**Event:** On May 30, 1985, while Unit 4 was at 100% power, a reactor trip occurred due to the loss of power from the AS inverter to the 120 VAC vital instrument bus for the panel 4P07. The loss of voltage on the vital bus resulted in the "B" steam generator level Channel II failing low, the steam generator feedwater control station transferring to manual. While manually controlling feedwater flow, a reactor trip occurred when the reactor protection logic of steam generator low level coincident with steam flow greater than feedwater flow on the 4B steam generator was completed due to a feedwater flow transient caused by a turbine runback. The unit was stabilized in a hot shutdown condition. The health and safety of the public were not affected. Similar occurrences: LERs 250-84-003, 250-84-014, 250-84-026, 251-84-011, 251-84-021, 251-84-022.

**Cause of Event:** The loss of power to the vital instrument bus serving the 4P07 panel resulted from a blown fuse on the AS spare inverter. Although a full set of tests were performed on the inverter which demonstrated that it met the manufacturer's specifications, the exact cause of the blown fuse could not be determined. In the past, both plants have experienced similar events due to the loss of power from these inverters.

**Corrective Actions:** The following corrective actions were taken after the event:

- 1) Power to the vital instrument bus for panel 4P07 was re-established at 6:52 p.m., following the reactor trip by manually transferring to the 4A inverter.
- 2) The AS inverter was successfully tested in accordance with the manufacturer's maintenance manual.
- 3) A post-trip review was performed and no abnormal operating conditions were identified. Following the satisfactory testing of the inverter, the unit was returned to service at 3:51 a.m. on May 31, 1985.
- 4) The long term corrective action to enhance the reliability of vital AC instrument power supplies will be to replace the inverters with a model of a different manufacturer. Replacement of the inverters for both Units 3 and 4 is currently scheduled to begin in July 1985.
- 5) As an interim measure, a comprehensive preventive maintenance task action plan was developed to enhance the reliability of the inverters until they are replaced.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/85

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
Turkey Point Unit 4	0 5 0 0 0 2 5 1	8 5	— 0 1 2	— 0 0 0	2	OF	0 2

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

**Event:**

On May 30, 1985, at 6:11 p.m., while Unit 4 was at 100% power, a reactor trip occurred due to the loss of the 120 VAC instrument power from the AS spare inverter. Since this inverter powers the vital instrument bus for the 4P07 panel, the loss of power to the 4P07 panel resulted in a loss of power to nuclear instrumentation system (NIS) power range Channel N-42. This channel generated a "rod drop" signal which initiated a turbine load reduction.

The loss of voltage on the vital bus of panel 4P07 also resulted in the "B" steam generator level Channel II failing low, the steam generator feedwater control station transferring to manual, and the loss of feedwater flow recorder. The operator took manual control of feedwater flow, relying on the steam generator level and feedwater flow indicators on Vertical Panel A located behind the main control panel. While manually controlling feedwater flow, a reactor trip occurred when the reactor protection logic of steam generator low level coincident with steam flow greater than feedwater flow on the 4B steam generator was completed due to a feedwater flow transient caused by the turbine runback. The unit was subsequently stabilized in a hot shutdown condition.

**Cause of Event:**

The loss of power to the vital instrument bus serving the 4P07 panel resulted from a blown fuse on the AS spare inverter. Although a full set of tests were performed on the inverter which demonstrated that it met the manufacturer's specifications after the fuse had been replaced, the exact cause of the blown fuse could not be determined. In the past, both plants have experienced similar events due to the loss of power from these inverters.

**Analysis of Event:**

A post-trip review was performed to assess the proper operation of safety-related equipment and the AS inverter was tested to assess its operability. After replacing the blown fuse on the AS inverter, the inverter successfully met manufacturer's test requirements. Other safety related equipment were verified to have functioned as designed upon actuation of the Reactor Protection System features. Similarly, the post-trip review established that the transient behavior of pertinent plant parameters for the reactor coolant system and steam generators responded normally. Therefore, the health and safety of the public were not affected.

**Corrective Actions:**

The following corrective actions were taken after the event:

- 1) Power to the vital instrument bus for panel 4P07 was re-established at 6:52 p.m., following the reactor trip by manually transferring to the 4A inverter.
- 2) The AS inverter was tested in accordance with the manufacturer's maintenance manual, after the blown fuse had been replaced. Logic and silicon control rectifier (SCR) circuits were satisfactorily tested, and the voltage and frequency outputs were verified with no adjustments required.
- 3) The "B" steam generator bistable setpoints were checked and found to be within specified tolerances.
- 4) A post-trip review was performed and no abnormal operating conditions were identified. Following the satisfactory testing of the inverter, the unit was returned to service at 3:51 a.m. on May 31, 1985.
- 5) The long term corrective action to enhance the reliability of vital AC instrument power supplies will be to replace the inverters with a model of a different manufacturer to meet revised performance specifications. Replacement of the inverters for both Units 3 and 4 is currently scheduled to begin in July 1985 and be completed by February 1986.
- 6) In the interim until inverters are replaced, Off-Normal Operating Procedures (ONOP) 003.6 through 003.9 have been developed to identify operator actions immediately following the loss of vital AC instrument power to individual control panels. As an additional interim measure, a preventive maintenance task action plan was developed to perform a comprehensive series of surveillance tests and inspections on all the Unit 3 and 4 inverters. This task action plan was developed to identify degraded or failed inverter components and to remedy those components to enhance the overall reliability of the inverters until the inverters are replaced.



JUL 1 1985

L-35-254

U. S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, D.C. 20555

Gentlemen:

Re: Reportable Event 85-12  
Turkey Point Unit 4  
Date of Event: May 30, 1985  
Reactor Protection System (RPS) Actuation - Reactor Trip

The attached Licensee Event Report is being submitted pursuant to the requirements of 10 CFR to provide notification of the subject event.

Very truly yours,

A handwritten signature in dark ink, appearing to read "J. W. Williams, Jr.", is written over a horizontal line.

J. W. Williams, Jr.  
Group Vice President  
Nuclear Energy

JWW/SAV/bc

Attachment

cc: Dr. J. Nelson Grace, Region II, USNRC  
Harold F. Reis, Esquire  
File 933.1

IE22  
1/1