

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Turkey Point Unit 4	DOCKET NUMBER (2) 0 5 0 0 1 0 1 2 5 1	PAGE (3) 1 OF 0 3
---	---	-----------------------------

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 6	0 6	8 5	8 5	0 1 3	0 0 0 7	0 8	8 5		Turkey Point Unit 3	0 5 0 0 0 2 5 0	
									N/A	0 5 0 0 0 1 1 1	

OPERATING MODE (9) N	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)			<input checked="" type="checkbox"/> 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 Abstract below and in Text, NRC Form 366A)		
	20.405(a)(1)(iii)			50.73(a)(2)(i)			50.73(a)(2)(viii)(A)					
	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)		TELEPHONE NUMBER	
NAME	AREA CODE		
R. D. Hart, Licensing Engineer	3 0 5 2 4 5 - 2 9 1 0		

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)										
CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPDOS		CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPDOS
X	E F	F U	S I 5 6	Y		X	I G F L T	S I 5 6 5	Y	
X	E F	A M P	E 3 5 3	Y						

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO				

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

Event: On June 6, 1985, Unit 4 experienced a reactor trip from 100% full power. The 4C inverter that was in service supplying power to the 120 volt vital instrument panel 4P06, tripped. The loss of power to panel 4P06 resulted in a loss of power to the nuclear instrumentation system (NIS) power range channel N-41. This channel generated a "NIS Rod Drop" signal which generated a turbine runback. The loss of 4P06 also caused the "A" steam generator (SG) feedwater control to transfer from automatic to manual remaining at a demand setting of 100% feedwater flow. The loss of automatic level control along with continuous feedwater flow resulted in the "A" SG level increasing until it reached the Hi-Hi level setpoint (80%) which tripped the turbine and both SG feedwater pumps. The reactor tripped as a result of the turbine trip.

Cause of Event: Investigations into the cause of the 4C inverter trip revealed a ground which originated in the input filters on the supply side of the power fuses in the NIS drawer for channel N-41. This is the most probable cause of the inverter trip.

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

- 1) Power to the vital instrument bus for panel 4P06 was re-established at 12:11 p.m., from the CS inverter. The affected equipment was then returned to its normal lineup.
- 2) The fuse was replaced on the 4C inverter and the input filters were replaced on NIS channel N-41.
- 3) A post-trip review was completed and no abnormal operating conditions were identified. Following completion of necessary repairs and testing, the unit was returned to service at 4:25 a.m., on June 7, 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.

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, and 251-85-012.

8507180374 850708
PDR ADOCK 05000251
S PDR

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

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

Event:

On June 6, 1985, at 11:21 a.m., Unit 4 experienced a reactor trip from 100% full power. At 11:19 a.m., the 4C static inverter tripped. The 4C inverter was in service supplying power to a 120 volt vital instrument panel (4P06). The loss of power to panel 4P06 resulted in a loss of power to the nuclear instrumentation system (NIS) power range channel N-41. This channel generated a "NIS Rod Drop" signal which generated a turbine runback.

The loss of 4P06 also caused the "A" steam generator (SG) feedwater control to transfer from automatic to manual remaining at a demand setting of 100% feedwater flow. The loss of automatic level control along with continuous feedwater flow resulted in the "A" SG level increasing until it reached the Hi-Hi level setpoint (80%) which tripped the turbine and both SG feedwater pumps. The reactor tripped when the reactor protection system logic of turbine trip was completed. The tripping of both SG feedwater pumps resulted in a feedwater isolation signal and an automatic start of the auxiliary feedwater (AFW) pumps.

Off-Normal Operating Procedure 4-ONOP-003.6, "Loss of 120 V Vital Instrument Panel 4P06", was used in an attempt to re-energize 4P06. At 11:45 a.m., both the CS (spare) and 3C inverter tripped. At 12:03 p.m., while attempting to energize 4P06, the 4C inverter tripped when breaker 4P06-14 was loaded on to the bus. Breaker 4P06-14 supplies power to NIS rack, channel 1. At 12:06 p.m., power was returned to the Unit 3 120 volt vital instrument panel 3P06, via the CS inverter. At 12:10 p.m., a decision was made to swap the CS inverter from 3P06 to 4P06 without loading breaker 4P06-14 onto the bus. This was done successfully and the instrumentation that had been lost on Unit 4 was regained. At 12:36 p.m., the 4C inverter was loaded onto 4P06 and the CS inverter was loaded onto 3P06 successfully.

Loss of 4P06 also de-energized level controller LC-460C and the pressurizer spray valve controllers (causing the spray valves to remain at their last demand position). The de-energizing of LC-460C generated a false indication of low pressurizer level (less than 14%) which de-energized the pressurizer heaters (control and backup) and initiated letdown isolation. At this time, a reactor coolant system (RCS) cooldown was in progress due to the feedwater transient. This resulted in a decrease in pressurizer pressure to approximately 1740 psig. The main steam isolation valves (MSIVs) were closed at 11:38 a.m., to help reduce the cooldown. The pressurizer heaters were re-energized at 11:45 a.m., by bypassing the de-energized level controller LC-460C and letdown was re-initiated to help stabilize pressurizer pressure and level.

Cause of Event:

Investigations into the cause of the 4C and CS inverter trips revealed a ground which originated in the input filters on the supply side of the power fuses in the NIS drawer for channel N-41. Investigations into the cause of the 3C inverter trip revealed a ground on the 3C inverter buffer amplifier card. These are the most probable causes of the inverter trips.

Analysis of Event:

At the time of the 3C inverter trip, Unit 3 was in a scheduled refueling outage with the RCS temperature at approximately 97 degrees Fahrenheit. A post-trip review was performed to assess the proper operation of safety-related equipment. After the problems with the inverters were resolved, the inverters were tested in accordance with the manufacturer's test requirements and placed back in service. Other safety related equipment were verified to have functioned as designed upon actuation of reactor protection system features. Similarly, the post-trip review established that the transient behavior of pertinent plant parameters for the reactor coolant system and SGs responded as expected of a reactor trip of this kind. Specifically, the RCS pressures and temperatures were determined to be following an expected pattern based on the conditions leading up to this transient. As a result of this event, procedural inadequacies were discovered that hampered the operators ability to respond to the loss of an inverter transient. These deficiencies have since been corrected. Based on the above, the health and safety of the public were not affected.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

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

Corrective Actions:

The following corrective actions were taken:

- 1) Power to the vital instrument bus for panel 4P06 was re-established at 12:11 p.m., from the CS inverter. The affected equipment was then returned to its normal lineup.
- 2) The Maintenance Department replaced the buffer amplifier card on the 3C inverter and fuse F6 on both the CS and 4C inverters. Upon completion of repairs, the inverters were returned to service.
- 3) The Instrument and Control Department replaced input filters FL-303 and FL-304 on the supply side of the power fuses on the NIS drawer for power range NIS channel N-41. After the filters were replaced, breaker 4P06-14 was loaded onto 4P06 with no further problems. NIS channel N-41 was tested as per Operating Procedure (OP) 12304.2, "Power Range Nuclear Instrumentation Periodic Channel Function Test", satisfactorily and declared operable at 11:32 p.m., on June 6, 1985.
- 4) A post-trip review was completed and no abnormal operating conditions were identified. Following completion of necessary repairs and testing, the unit was returned to service at 4:25 a.m., on June 7, 1985, and achieved full power at 8:40 a.m., on June 7, 1985.
- 5) As an 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. This task action plan has been completed.
- 6) Off-Normal Operating Procedures (ONOP) 003.6 through 003.9 have been revised to address the inadequacies identified during the post-trip review.
- 7) 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 and be completed by February 1986.



JUL 8 1985

L-85-264

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

Gentlemen:

Re: Reportable Event 85-13
Turkey Point Unit 4
Date of Event: June 6, 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 cursive script, appearing to read "J. W. Williams, Jr.", is written over a horizontal line.

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

JWW/PLP/cas

Attachment

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

IE22
11

PEOPLE...SERVING PEOPLE