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 FACIL:50-250 Turkey Point Plant, Unit 3, Florida Power and Light C 05000250
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SUBJECT: LER 89-009-00:on 890519,10CFR50 App R safe shutdown analysis
 design inadequacy.

W/8 ltr.

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MAY 19 1989

L-89-191
10 CFR 50.73

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

Gentlemen:

Re: Turkey Point: Unit 3
Docket No. 50-250
Reportable Event: 89-09
Date of Event: April 21, 1989
10CFR50 Appendix R Safe Shutdown Analysis Design Inadequacy

The attached Licensee Event Report is being submitted pursuant to the requirements of 10 CFR 50.73 to provide notification of the subject event.

Very truly yours,

C. O. Woody
Acting Senior Vice President - Nuclear

COW/TCG/cm

Attachment

cc: Stewart D. Ebnetter, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant

8906020200 890519
PDR ADUCK 05000250
S PDC



LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Turkey Point Unit 3										DOCKET NUMBER (2) 0 5 0 0 0 2 5 0										PAGE (3) 1 OF 0 4	
TITLE (4) 10 CFR 50 Appendix R Safe Shutdown Analysis Design Inadequacy																					
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 4	2 1	8 9	8 9	0 0 9	0 0	0 5	1 9	8 9	Turkey Point Unit 4						0 5 0 0 0 2 5 1						
																0 5 0 0 0					
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)																			
5		20.402(b)				20.406(e)				50.73(e)(2)(iv)				73.71(b)							
POWER LEVEL (10)		20.406(e)(1)(i)				50.38(e)(1)				X 50.73(e)(2)(v)				73.71(e)							
0 0 0		20.406(e)(1)(ii)				50.38(e)(2)				50.73(e)(2)(vii)				OTHER (Specify in Abstract below and in Text, NRC Form 368A)							
		20.406(e)(1)(iii)				50.73(e)(2)(i)				50.73(e)(2)(viii)(A)											
		20.406(e)(1)(iv)				50.73(e)(2)(ii)				50.73(e)(2)(viii)(B)											
		20.406(e)(1)(v)				50.73(e)(2)(iii)				50.73(e)(2)(ix)											
LICENSEE CONTACT FOR THIS LER (12)																					
NAME Dennis W. Herrin, Regulation and Compliance										TELEPHONE NUMBER											
										AREA CODE 3 0 5 2 4 6 1 - 6 7 4 9											
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																					
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC											
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 21, 1989, at 1730, with Units 3 and 4 in Mode 5 (cold shutdown), FP&L Engineering identified an Appendix R Safe Shutdown Analysis design inadequacy at Turkey Point. The Chemical and Volume Control System charging pumps take suction from either the Volume Control Tank through valve LCV-115C or the Refueling Water Storage Tank through valve LCV-115B. An interlock is provided such that LCV-115B will open if LCV-115C closes. Had a fire occurred in either the Charging Pump Room or Rod Control Equipment Room, LCV-115B may not have opened, LCV-115C may have closed spuriously and the operating charging pump may have been damaged due to flow starvation. The cause of this event was design inadequacy. The initial Appendix R design review failed to recognize the criticality of timing with regard to alignment of an alternate water source to preclude potential charging pump damage. Fire watches have been established in the Unit 4 Charging Pump Room and Rod Control Equipment Room. Procedure 4-ONOP-016.9 has been issued providing for operator actions upon notification of a fire in these areas. Similar actions will be taken on Unit 3 prior to Mode 4 entry from Mode 5. Long-term corrective action alternatives are under investigation by FP&L Engineering.

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TEXT (If more space is required, use additional NRC Form 368A's) (17)

DESCRIPTION OF THE EVENT

On April 21, 1989, with Units 3 and 4 in Mode 5 (cold shutdown), a design inadequacy in the Appendix R Safe Shutdown Analysis was identified by FP&L Engineering.

In accordance with the Appendix R Safe Shutdown Analysis, credit is taken (in each fire area) for only one Chemical and Volume Control System (CVCS) charging pump (EIIIS:CB, Component:P) as being available for safe shutdown. Only one charging pump is required to maintain hot standby and achieve cold shutdown in the event of a fire. The charging pumps take suction from either the Volume Control Tank (VCT) through normally open motor-operated level control valve LCV-115C, or from the Refueling Water Storage Tank (RWST) through normally closed air-operated control valve LCV-115B. An interlock is provided between these valves such that LCV-115B will open if LCV-115C closes.

Since the circuits for valve LCV-115B are routed through the Charging Pump Room and the Rod Control Equipment Room, it must be assumed that valve LCV-115B will be rendered inoperable due to the adverse effects of a fire in either area. Consequently, should a fire in the Charging Pump Room cause a spurious closure of valve LCV-115C while charging pump "B" is running, or should a fire in the Rod Control Equipment Room cause a spurious closure of valve LCV-115C while charging pumps "A" and "C" are running, the pump(s) will be starved of suction flow from the VCT and RWST since valve LCV-115B may not open. This could potentially cause damage to the operating charging pump(s) due to flow starvation and result in the inability of the applicable charging pump(s) to perform the required safe shutdown function. This scenario applies to either Unit 3 or Unit 4.

The Appendix R Safe Shutdown Analysis takes credit for operator action to mitigate the adverse effects of spurious operation of LCV-115C by aligning an alternate water source to the charging pump(s) prior to sustaining damage. However, the short amount of time available before pump damage could occur was not recognized.

CAUSE OF THE EVENT

The cause of this event was design inadequacy in that the initial Appendix R Safe Shutdown Analysis design review failed to recognize the criticality of timing with regard to alignment of an alternate water source to preclude potential charging pump damage upon spurious closure of LCV-115C.

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

ANALYSIS OF THE EVENT

The scenario for this event requires an unlikely sequence of events to occur simultaneously:

The VCT outlet valve closes spuriously due to a fire.

The RWST valve logic circuitry is damaged by a fire to the point of malfunction.

The associated charging pump(s) is/are running.

A fire of extreme severity is required to reach the potential for this event to occur. The Turkey Point Final Safety Analysis Report shows the Charging Pump Rooms as having a low level of "combustible loading". This "combustible loading", in conjunction with the Fire Protection features provided, should prevent this level of damage.

The major source of combustibles in the Rod Control Equipment Rooms is the exposed cable in the cable trays. No ignition source, besides the cables, is available to initiate a fire which could involve the cable trays. This design minimizes the potential for a severe fire.

Had a fire occurred in either the Charging Pump Room or Rod Control Equipment Room and resulted in a loss of all charging flow during power operation, plant Technical Specification 3.6.d would have been entered and procedure 3/4-ONOP-047.1, "Loss of Charging Flow, in Modes 1 through 3," would have been implemented. This procedure requires an operator to determine the cause of the charging pump failure and attempt to reestablish charging flow. If charging flow can not be reestablished, the operator closes the letdown orifice isolation valves and the seal return isolation valve and initiates a shutdown to Mode 3 (hot standby). If charging flow has not been reestablished after reaching hot standby, provisions are made to ensure that Reactor Coolant System inventory lost due to Reactor Coolant Pump number 2 seal leakage is replaced by flow from the Safety Injection Pumps. A controlled cooldown per procedure 3/4-GOP-305, "Hot Standby to Cold Shutdown," is then initiated utilizing the Safety Injection Pumps as needed to maintain Pressurizer level. If the Safety Injection Pumps are not operable, time is available to take other mitigating actions to prevent escalation of the event.

Based on the above, the health and safety of the public would not have been affected.

CORRECTIVE ACTIONS

1. Fire watches were established for Unit 4 and will be established for Unit 3 in the Charging Pump Room and the Rod Control Equipment Room in accordance with approved Engineering Safety Evaluations prior to entering Mode 4 from Mode 5. Fire watches meet the requirements of procedure O-ADM-016.4, "Fire Watch Patrol," and have means of direct and

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immediate communications to the Control Room.

2. Procedure 4-ONOP-016.9, "Response to a Reported Fire in the Charging Pump Room, Rod Control Equipment Room, Cable Spreading Room or Control Room," was issued on April 27, 1989. Operator training on this procedure has been performed.
3. Procedure 3-ONOP-016.9 will be issued for Unit 3 prior to entering Mode 4 from Mode 5.
4. A number of long-term corrective actions to resolve the identified Appendix R Safe Shutdown Analysis design inadequacy on Units 3 and 4 are currently being evaluated by FP&L Engineering.

ADDITIONAL INFORMATION

None. No similar Licensee Event Reports have been issued from Turkey Point.