



**FPL**

AUG 31 2000

L-2000-175  
10 CFR § 50.73

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

Re: Turkey Point Units 3 & 4  
Docket Nos. 50-250 & 50-251  
Reportable Event: 2000-003-00  
Date of Event: August 1, 2000  
Incorrect Limit Switch Wiring Design  
of Containment Isolation Solenoid Valves

The attached Licensee Event Report 250/2000-003-00 is being submitted pursuant to the requirements of 10 CFR § 50.73 to provide notification of the subject event.

If there are any questions, please contact us.

Very truly yours,

R. J. Hovey  
Vice President  
Turkey Point Plant

GSS

Attachment

cc: Regional Administrator, USNRC, Region II  
Senior Resident Inspector, USNRC, Turkey Point Plant

IF 22

**LICENSEE EVENT REPORT (LER)**

(See reverse for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

<b>FACILITY NAME (1)</b> Turkey Point Unit 3	<b>DOCKET NUMBER (2)</b> 05000250	<b>PAGE (3)</b> Page 1 of 5
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**TITLE (4)**  
Incorrect Limit Switch wiring design of Containment Isolation Solenoid Valves.

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 NAME	DOCKET NUMBER
08	01	2000	2000	- 003	- 00				Turkey Point Unit 4	05000251
									FACILITY NAME	DOCKET NUMBER

<b>OPERATING MODE (9)</b>	1	<b>THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (Check one or more) (11)</b>								
<b>POWER LEVEL (10)</b>	100	20.2201(b)	20.2203(a)(2)(v)	50.73(a)(2)(i)	50.73(a)(2)(viii)					
		20.2203(a)(1)	20.2203(a)(3)(i)	x 50.73(a)(2)(ii)	50.73(a)(2)(x)					
		20.2203(a)(2)(i)	20.2203(a)(3)(ii)	50.73(a)(2)(iii)	73.71					
		20.2203(a)(2)(ii)	20.2203(a)(4)	50.73(a)(2)(iv)	OTHER					
		20.2203(a)(2)(iii)	50.36(c)(1)	50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A					
		20.2203(a)(2)(iv)	50.36(c)(2)	50.73(a)(2)(vii)						

LICENSEE CONTACT FOR THIS LER (12)	
NAME Girija S. Shukla, Principal Licensing Engineer	TELEPHONE NUMBER (Include Area Code) (305) 246 - 6047

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)										
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	
-	-	-	-	-	-	-	-	-	-	-

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO					

**ABSTRACT**

On 8/1/00, with the Turkey Point Units 3 & 4 at 100% in Mode 1, FPL determined that the indicating light circuits of containment isolation solenoid valves SV-3/4-2911, SV-3/4-2912, and SV-3/4-2913 did not comply with the requirements of Regulatory Guide 1.97 for accident monitoring instrumentation, or with the description in the UFSAR Tables 7.5-1 and 7.5-2. The valves are equipped with limit switches which change state at the fully opened and fully closed positions. The open limit switch provided contact output to a relay which controlled the red, green, and white position indicating lights. The position indication was designed and wired to provide Open/Not Open indication, rather than the Open/Closed indication stated in the UFSAR, or the Closed/Not Closed indication required by Regulatory Guide 1.97. This design existed on both units. This condition was reported on August 1, 2000, under the requirement of 10 CFR 50.72(b)(1)(ii)(B) as a condition that is outside of the design basis.

The cause of this event was human error in designing the wiring of the limit switches in the early 1970s, which provided inaccurate indication of valve position. The limit switch wiring was modified and the UFSAR Tables 7.5-1 and 7.5-2 will be updated to bring the valve position indication into conformance with Regulatory Guide 1.97 requirements.

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

BACKGROUND

On 06/06/2000, during Inservice Testing of the Phase "A" Containment Isolation Valve, a licensed operator noted that the white indicating light [JM:il] for the fast acting Air Operated Valve (AOV) CV-4-855 [JM:isv] appeared to indicate closed while the valve was stroking closed. The white indicating light was brightly lit when the valve was in the intermediate position. The white light is required to be brightly lit when the valve is fully closed, and dimly lit otherwise. This condition was difficult to detect because the valve strokes in less than two seconds and the red and green open/closed lights are physically separated from the white lights. A Condition Report was generated to investigate the apparent problem.

The limit switches for CV-4-855 position indication were not wired correctly for the white light circuit. The white light wiring at CV-4-855 was found to be connected to the open (upper) limit switch, whereas the design drawings require these leads to be connected to the close (lower) limit switch. To correct the situation, the limit switches were re-wired to comply with the design drawings and the white light was successfully tested and returned to service on 06/28/00. The miswiring of the white indicator light had no effect on the valve's operation, and AOV CV-4-855 was still capable of performing its containment isolation function.

Since one of the white light indicators was miswired, a sample group of other white light indicators for other valves was identified and reviewed to ensure that a generic problem did not exist. When a problem was identified with the white light indication for one of the valves in the sample group, a decision was made to verify proper indication for all of the Phase "A" white lights. All Phase "A" containment isolation valve indicators were then either reviewed or tested, except the Letdown Isolation valves CV-3/4-204. Interim administrative controls were imposed to ensure verification of isolation using other indications. The letdown isolation valves will be tested during the next unit outages for each unit.

No problems were found on 23 of 24 valves tested for Unit 3. Of the 23 Unit 4 valves examined, 2 more valves (CV-4-956A and CV-4-956B) in the vicinity of CV-4-855 were found to have the same error. To correct the situation the limit switches were re-wired to comply with the design drawings. Because three valves in the same general area were found miswired in the same manner, the most likely cause is human error by a single individual. FPL believes the miswiring occurred during original circuit installation or in a subsequent design change that involved all three of these valves, since maintenance records show no activities involving wiring on these valves.

Additionally, the circuit drawings review revealed that the indicating light circuits of containment isolation solenoid valves SV-3/4-2911, SV-3/4-2912, and SV-3/4-2913 [JM:isv] were designed incorrectly. The design configuration error found with these solenoid valves was unrelated to the miswiring found in the other three air operated valves, but is the subject of this report, as described below.

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DESCRIPTION OF THE EVENT

On 8/1/00, with the Turkey Point Units 3 & 4 at 100% in Mode 1, during a review of containment isolation Phase "A" indication circuit drawings, Florida Power & Light Company (FPL) determined that the limit switch wiring design of the very fast acting containment isolation solenoid valves SV-3/4-2911, SV-3/4-2912, and SV-3/4-2913, did not comply with the requirements of Regulatory Guide 1.97 for accident monitoring instrumentation [IP], or the description in the Updated Final Safety Analysis Report (UFSAR) Tables 7.5-1 and 7.5-2. The valves are equipped with limit switches which change state at the fully opened and fully closed positions.

The open limit switch provided contact output to a relay which controlled the red, green, and white position indicating lights. The position indication was designed and wired to provide Open/Not Open indication, rather than the Open/Closed indication as stated in the UFSAR, or the Closed/Not Closed indication required by Regulatory Guide 1.97.

The white indicating lights, used to confirm complete closure of the containment isolation valves, were wired to the "ao" limit switch contacts. This condition adversely effected the operation of the white light causing it to falsely indicate that the valve was closed (bright light), when in fact the valve could be in an intermediate position. The "ao" contact changes state when the valve travels to its full open position. This design (and installed configuration) could differentiate only between Open and Not Open, and could not provide valve position indication that differentiated between Closed and Not Closed. The white lights should have been wired to the "bc" limit switch contacts to provide Closed/Not Closed indication.

The Regulatory Guide 1.97 position indication requirement for the containment isolation valves is stated as Closed/Not Closed. The valve indicating lights are listed in UFSAR Tables 7.5-1 and 7.5-2, which describe the lights as providing Open/Closed indication. However, these valves were configured to provide Open/Not Open indication, which does not comply with either UFSAR Tables 7.5-1 and 7.5-2, or Regulatory Guide 1.97 requirements. The Regulatory Guide 1.97 implementation/design review was completed in 1984. However, FPL believes this design has existed on both units since the original design in the early 1970s.

Since the installed configuration did not meet the plant design basis as described in the UFSAR, the condition was considered to be reportable under the requirement of 10 CFR 50.72(b) (1) (ii) (B) as a condition that is outside of the design basis, and a one-hour report was issued on August 1, 2000.

CAUSE OF THE EVENT

The cause of this event was human error and inattention to detail in designing the wiring of the limit switches in the early 1970s, which provided inaccurate indication of valve position. The initial design of the white light valve position indication did not consider the critical function of displaying full closure of containment isolation valves.

ANALYSIS OF THE EVENT

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System Description

The containment isolation valves are required to mitigate the consequences of a loss of coolant accident. Phase "A" Isolation is initiated by a safety injection (SI) signal. SV-3/4-2911, 2912 and 2913 are solenoid operated containment isolation valves for Containment Air sampling. The valves provide automatic containment isolation for the R-11 and R-12 containment atmosphere process radiation monitors. The solenoid valves close automatically upon receipt of a Phase "A" containment isolation signal, and are equipped with limit switches to provide remote indication of valve position. For each valve, one set of limit switch contacts is used to operate a white indicating light in the control room. The containment isolation valves are designed to indicate OPEN with a dim white light and CLOSED with a bright white light. The white lights are grouped into arrays on control room panels and allow the control room operator to quickly determine whether all of the automatic containment isolation valves have closed following Phase "A" isolation. The critical function of each white light is to indicate full closure of the respective valve, i.e., Closed/Not Closed. Contrary to this performance requirement, the referenced solenoid valves were configured such that the lights provided Open/Not Open indication.

The white, red, and green lights provide indication of valve position in the control room. Typically, a red light means the valves are OPEN, a green light means they are CLOSED, as indicated below. The incorrect wiring of the white indicator light had no effect on the valves' operation or their ability to close and isolate. These valves are also tested periodically by the Inservice Testing Program.

Solenoid Valve Position Indication Logic Before Modification

Valve Position	White Light	Red Light	Green Light
Open	Dim	On	Off
Intermediate	Bright	Off	On
Closed	Bright	Off	On

Analysis of Safety Significance

The containment isolation valves are required to mitigate the consequences of a loss of coolant accident. The incorrect limit switch wiring design resulting in the miswiring of the white indicator light had no effect on the valve's operation. Therefore, it does not affect the valves' ability/requirement to close upon receipt on a containment isolation signal in mitigating a design bases event. Hence, the safety function of effecting containment integrity for their respective penetrations was not impacted for these valves.

However, in the event of a failure of one of these valves to close during isolation conditions, identification of an open or partially open valve could have been delayed.

CORRECTIVE ACTIONS

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1. A review of the indicating light circuits of applicable valves was performed to verify compliance with UFSAR and Regulatory Guide 1.97 requirements.
2. The limit switch wiring was modified to bring the valve position indication into conformance with Regulatory Guide 1.97 requirements for accident monitoring instrumentation. The modification provided wiring changes at the limit switches and at the associated interposing relays. This modification redesigned the limit switch wiring to use spare "bc" switch contacts to operate the red, green, and white indicating lights. The modification changed the wiring for the red light to be lit when the valves are in full open and intermediate position, and to cause the green lights to be lit and the white lights to be brightly lit when the valves are in full closed position. The wiring modifications will now allow unambiguous determination that the containment isolation function has been accomplished. The modifications involved only minor wiring changes, and did not require any component replacement.

Solenoid Valve Position Indication Logic After Modification

Valve Position	White Light	Red Light	Green Light
Open	Dim	On	Off
Intermediate	Dim	On	Off
Closed	Bright	Off	On

The modification will also update the UFSAR Tables 7.5-1 and 7.5-2, for these specific valves to state Closed/Not Closed position to reflect the current design and to bring the valve position indication into conformance with Regulatory Guide 1.97 requirements.

3. The wiring errors found on CV-4-855, CV-4-956A, and CV-4-956B were corrected. The wiring diagrams for these three valves were verified to be correct.
4. Of the 24 valves (on each unit) possibly affected, 23 have been corrected or verified correct. CV-3/4-204 will be verified correct at the next available opportunity.
5. This event will be included in Engineering Personnel continuing training for lessons learned.

ADDITIONAL INFORMATION

EIIS Codes are shown in the format [EIIS SYSTEM:IEEE component function identifier, second component function identifier (if appropriate)]. There have been no previous similar events at Turkey Point Units 3 & 4.