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10 CFR § 50.73
L-2010-228

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555-0001

Re: Turkey Point Unit 4
Docket No. 50-251
Reportable Event: 2010-005-00
Date of Event: September 9, 2010
Failure of Group Step Counter with Valid Manual Actuation of the Reactor Protection System

The attached Licensee Event Report 05000251/2010-005-00 is being submitted pursuant to 10 CFR 50.73(a)(2)(iv)(A) due to a valid manual actuation of the Reactor Protection System. The reactor was subcritical at the time in Mode 3. The reactor trip breakers were opened in accordance with procedures as required by the Action of Technical Specification 3.1.3.3.

If there are any questions, please call Mr. Robert Tomonto at 305-246-7327.

Very truly yours,

Michael Kiley
Vice President
Turkey Point Nuclear Plant

Attachment

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

JE22
NRK

NRC FORM 366 (9-2007)		U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB: NO. 3150-0104		EXPIRES: 08/31/2010												
LICENSEE EVENT REPORT (LER)										Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose 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.									
1. FACILITY NAME					2. DOCKET NUMBER					3. PAGE									
Turkey Point Unit 4					05000251					1 of 3									
4. TITLE																			
Failure of Group Step Counter with Valid Manual Actuation of the Reactor Protection System																			
5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED										
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME			DOCKET NUMBER							
9	9	2010	2010	005	00	10	12	2010	FACILITY NAME			DOCKET NUMBER							
9. OPERATING MODE			11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)																
3			<input type="checkbox"/> 20.2201(b)			<input type="checkbox"/> 20.2203(a)(3)(i)			<input type="checkbox"/> 50.73(a)(2)(i)(C)			<input type="checkbox"/> 50.73(a)(2)(vii)							
10. POWER LEVEL			<input type="checkbox"/> 20.2201(d)			<input type="checkbox"/> 20.2203(a)(3)(ii)			<input type="checkbox"/> 50.73(a)(2)(ii)(A)			<input type="checkbox"/> 50.73(a)(2)(viii)(A)							
			<input type="checkbox"/> 20.2203(a)(1)			<input type="checkbox"/> 20.2203(a)(4)			<input type="checkbox"/> 50.73(a)(2)(ii)(B)			<input type="checkbox"/> 50.73(a)(2)(viii)(B)							
			<input type="checkbox"/> 20.2203(a)(2)(i)			<input type="checkbox"/> 50.36(c)(1)(i)(A)			<input type="checkbox"/> 50.73(a)(2)(iii)			<input type="checkbox"/> 50.73(a)(2)(ix)(A)							
			<input type="checkbox"/> 20.2203(a)(2)(ii)			<input type="checkbox"/> 50.36(c)(1)(ii)(A)			<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)			<input type="checkbox"/> 50.73(a)(2)(x)							
			<input type="checkbox"/> 20.2203(a)(2)(iii)			<input type="checkbox"/> 50.36(c)(2)			<input type="checkbox"/> 50.73(a)(2)(v)(A)			<input type="checkbox"/> 73.71(a)(4)							
			<input type="checkbox"/> 20.2203(a)(2)(iv)			<input type="checkbox"/> 50.46(a)(3)(ii)			<input type="checkbox"/> 50.73(a)(2)(v)(B)			<input type="checkbox"/> 73.71(a)(5)							
0%			<input type="checkbox"/> 20.2203(a)(2)(v)			<input type="checkbox"/> 50.73(a)(2)(i)(A)			<input type="checkbox"/> 50.73(a)(2)(v)(C)			<input type="checkbox"/> OTHER							
<input type="checkbox"/> 20.2203(a)(2)(vi)			<input type="checkbox"/> 50.73(a)(2)(i)(B)			<input type="checkbox"/> 50.73(a)(2)(v)(D)			Specify in Abstract below or in NRC Form 366A										
12. LICENSEE CONTACT FOR THIS LER																			
NAME										TELEPHONE NUMBER (Include Area Code)									
Ronald L. Everett										305-246-6190									
13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT																			
CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX										
X	AA	CTR	W120	N															
14. SUPPLEMENTAL REPORT EXPECTED										15. EXPECTED SUBMISSION DATE			MONTH	DAY	YEAR				
<input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE)										<input checked="" type="checkbox"/> NO									
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)																			
<p>On September 9, 2010 at approximately 16:34 hours, the unit entered Technical Specification (TS) 3.1.3.3 Action as a result of the Control Bank C Group 1 Step Counter failing to increment. The reactor was subcritical in Mode 3 progressing to reactor startup. The reactor trip breakers were opened as required by the Action of TS 3.1.3.3. The TS requires that the reactor trip breakers be opened if the Bank demand counters (group 1 and group 2) are not within +/- 2 steps of each other. All rods fully inserted. The unit remained in Mode 3. This was a manual actuation of the Reactor Protection System. Therefore, an 8-hour report (EN# 46246) was made in accordance with 10 CFR 50.72(b)(3)(iv) to the NRC Operations Center. The apparent cause of the event was failure of a Step Counter Battery. The Group Step Counters are driven by lithium ion batteries. The failure of the battery was unpredictable, with minimal consequences. There was no reason to expect early failure. The failed battery was replaced, along with the remainder of the Step Counter Batteries. A five year search of the plant, INPO, and NRC databases was performed and did not reveal any previous similar occurrences. Therefore, no further actions have been recommended.</p>																			

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Turkey Point Unit 4	05000251	2010	- 005	- 00	2 of 3

NARRATIVE

DESCRIPTION OF THE EVENT

On September 9, 2010 at approximately 16:34 hours, the unit entered Technical Specification (TS) 3.1.3.3 Action as a result of the Control Bank C Group 1 Step Counter [AA, CTR] failing to increment. The reactor was subcritical in Mode 3 progressing to reactor startup. The reactor trip breakers were opened as required by the Action of TS 3.1.3.3. The TS requires that the reactor trip breakers be opened if the Bank demand counters (group 1 and group 2) are not within +/- 2 steps of each other. All rods fully inserted. The unit remained in Mode 3. This was a manual actuation of the Reactor Protection System. Therefore, an 8-hour report (EN# 46246) was made in accordance with 10 CFR 50.72(b)(3)(iv) to the NRC Operations Center. The apparent cause of the event was failure of a Step Counter Battery. The Group Step Counters are driven by lithium ion batteries. The failure of the battery was unpredictable, with minimal consequences. There was no reason to expect early failure. The failed battery was replaced, along with the remainder of the Step Counter Batteries. A five year search of the plant, INPO, and NRC databases was performed and did not reveal any previous similar occurrences. Therefore, no further actions have been recommended.

CAUSE OF THE EVENT

The apparent cause of the event was the failure of the Step Counter to increment as required because of an early failure of the installed battery. The battery failed in such a way as to not alert operators. When the battery failed, it did not have enough energy to light the failed battery warning indicator, yet it provided enough energy to drive the LCD display by displaying a Zero (it was even able to increment to 1) but not enough energy to supply the driver circuits for the counters. Since these batteries were still early in their useful life, and no work had been done to the rod control cabinets, no post maintenance test (PMT) was necessary/performed. With an expected life of 8 to 10 years, a battery replacement cycle of 36 months, and a good service history to date of replacement batteries, there was no reason to suspect the impending battery failure.

ANALYSIS OF THE EVENT

During operation of the Rod Control System, the Logic Cabinet generates and sends pulses to the Power Cabinets. When the Power Cabinet receives this pulse it initiates a Rod Step. When the Rod Step cycle is complete a reply pulse is sent back to the Logic Cabinet. Once this reply pulse is received at the Logic Cabinet, the Logic Cabinet then triggers a relay which in turn sends out a 100 Vdc pulse to the associated Group (demand) Step Counter on the Control Room Operator's Console. When this pulse is received at the Group (demand) Step counter the step counter increments in the required direction (+1 if rods out and -1 if rods in). These Group (demand) Step Counters are driven by lithium ion batteries which are projected to last 8-10 years based on the manufacturer's literature. The current Preventive Maintenance (PM) cycle has the site replacing these batteries on a 36 month basis, which is well within the 8-10 year expected life. These batteries are replaced during refueling outages after which the Group Step Counters receive PMT by operating the rod control system during cold rod stepping, which is the only true PMT of the group step counters. During the recent Unit 4 forced outage, a battery failed in the Group 1, Bank C, Group Step Counter, and went unnoticed

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NARRATIVE

until the rods were withdrawn and the counter did not increment. With Unit 4 in Mode 3 at the time, the TS required the reactor trip breakers to be opened. These batteries were installed during Unit 4, Cycle 24 refueling outage (circa May, 2008) and were thoroughly tested prior to installation; therefore there was no reason to suspect early failure. The Group Step Counters all appeared to be functional when the reactor reset startup pushbutton was pushed and counters reset and displayed Zero. A review of the design schematics of the Group Step Counters revealed that the display may indeed work while the counting circuits may not due to low battery supply voltage.

REPORTABILITY

The event is considered to be reportable in accordance with 10 CFR 50.73(a)(2)(iv)(A) due to failure of the step counters to be within +/- 2 steps of each other, requiring the reactor trip breakers to be opened in accordance with the Action of TS 3.1.3.3 (a manual actuation of the Reactor Protection System.)

ANALYSIS OF SAFETY SIGNIFICANCE

At the time of the event, the reactor was in Mode 3 (sub-critical) and the plant remained in mode 3. The reactor trip breakers were opened and all systems functioned as required. There was no impact on safety.

CORRECTIVE ACTIONS

Corrective actions were taken to replace all of the Unit 4 step counter batteries. Each unit contains these same batteries. The current PM replaces the batteries on a 36 month basis on batteries that are expected to last eight to ten years. The PM basis was reviewed and determined to be correct. No further adjustments were recommended at this time.

ADDITIONAL INFORMATION

EIIS Codes are shown in the format [IEEE system identifier, component function identifier, second component function identifier (if appropriate)]. Condition Report 2010-00578725 was initiated due to this event.

FAILED COMPONENTS IDENTIFIED: Step Counter battery.

PREVIOUS SIMILAR EVENTS: None in the last five years.