FPL.

L-2013-326
10 CFR § 50.73
November 27, 2013

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

Re: Turkey Point Unit 3
Docket No. 50-250
Reportable Event: 2013-009-00
Loose Breaker Control Power Fuse Holder Caused 3B ICW Pump to be Inoperable Longer than Allowed Outage Time

The attached Licensee Event Report 05000250/2013-009-00 is submitted in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by the Technical Specifications.

If there are any questions, please call Mr. Robert J. 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

IE22
NRR

Florida Power & Light Company
9760 SW 344th St., Florida City, FL 33035

NRC FORM 366 (10-2010) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2013

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA/Privacy Section (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.resourse@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.

LICENSEE EVENT REPORT (LER)

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4. TITLE

Loose Breaker Control Power Fuse Holder Caused 3B ICW Pump to be Inoperable Longer than AOT

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	28	2013	2013	- 009 -	00	11	27	2013	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE

1

10. POWER LEVEL

100

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: *(Check all that apply)*

- ☐ 20.2201(b)
- ☐ 20.2201(d)
- ☐ 20.2203(a)(1)
- ☐ 20.2203(a)(2)(i)
- ☐ 20.2203(a)(2)(ii)
- ☐ 20.2203(a)(2)(iii)
- ☐ 20.2203(a)(2)(iv)
- ☐ 20.2203(a)(2)(v)
- ☐ 20.2203(a)(2)(vi)
- ☐ 20.2203(a)(3)(i)
- ☐ 20.2203(a)(3)(ii)
- ☐ 20.2203(a)(4)
- ☐ 50.36(c)(1)(i)(A)
- ☐ 50.36(c)(1)(ii)(A)
- ☐ 50.36(c)(2)
- ☐ 50.46(a)(3)(ii)0
- ☐ 50.73(a)(2)(i)(A)
- ☒ 50.73(a)(2)(i)(B)
- ☐ 50.73(a)(2)(i)(C)
- ☐ 50.73(a)(2)(ii)(A)
- ☐ 50.73(a)(2)(ii)(B)
- ☐ 50.73(a)(2)(iii)
- ☐ 50.73(a)(2)(iv)(A)
- ☐ 50.73(a)(2)(v)(A)
- ☐ 50.73(a)(2)(v)(B)
- ☐ 50.73(a)(2)(v)(C)
- ☐ 50.73(a)(2)(v)(D)
- ☐ 50.73(a)(2)(vii)
- ☐ 50.73(a)(2)(viii)(A)
- ☐ 50.73(a)(2)(viii)(B)
- ☐ 50.73(a)(2)(ix)(A)
- ☐ 50.73(a)(2)(x)
- ☐ 73.71(a)(4)
- ☐ 73.71(a)(5)
- ☐ OTHER

Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

NAME	TELEPHONE NUMBER (Include Area Code)
Paul F. Czaya	305-246-7150

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

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On September 28, 2013 at approximately 1929 hours, with the Unit 3 reactor at 100% power, Operations personnel discovered that power to the 3B Intake Cooling Water (ICW) pump breaker closing circuit and charging springs was lost. The UC (closing circuit) fuse holder was noted to be slightly backed out about ⅛ inch. Control power was restored after the fuse holder was pressed back in place. Further investigation determined that the 3B ICW pump was inoperable for a period longer (approximately 4 days) than the allowed outage time of 72 hours because the pump could not have performed its intended function to help mitigate a loss of coolant accident coincident with a loss of offsite power (LOOP). The breaker would not have been able to open on a LOOP then close for diesel generator loading. The causes are attributed to improper fuse installation and wear on the fuse holder stabs and clips. Corrective actions include: 1) Revise 4160 volt breaker operating procedure to provide guidance for ensuring UC fuse holders are tight after installation, and 2) Establish UC fuse holding force inspection acceptance criteria for 4160 volt breakers, perform inspections, and replace fuse holder assemblies as required. Only one of three provided ICW pumps is required to perform the safety function. The other two ICW pumps were available during the time the 3B ICW pump was inoperable, therefore, the safety significance of this event is considered to be low.

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NARRATIVE

DESCRIPTION OF THE EVENT

On September 28, 2013 at approximately 1929 hours, with the Unit 3 reactor [AC, RCT] in Mode 1 at 100% rated thermal power, Operations personnel discovered that the green and white indicating lights [BS, P, BKR, JC, IL] were not lighted on the 3B Intake Cooling Water (ICW) pump [BS, P] 3AB17 power supply breaker [BKR, 52] cubicle. This was noted shortly after the 3B ICW pump was stopped at approximately 1847 that day. After changing the light bulbs, the green light illuminated, but the white light did not. The white indicating light shows that power is available to the breaker closing circuit and the charging springs are charged.

Further investigation revealed that the UC (closing circuit) fuse holder [BS, P, BKR, JC, FUB] was slightly backed out about ⅛ inch. Pressure was applied to push in the fuse holder, it moved until it was flush with the base, and the white indicating light was restored at approximately 0030 on September 29, 2013. The 3B ICW pump was considered inoperable from 1929 on September 28, 2013 until declared operable after test at approximately 0050 on September 29, 2013. Condition reports and a work request were initiated to address the event.

A past operability review determined that the 3B ICW pump was inoperable between the times the pump was last started on September 24, 2013 at approximately 2114 until restoration of the closing circuit fuse and demonstration of pump operability on September 29, 2013 at 0050 because the 3B ICW pump could not have performed its intended function to help mitigate a loss of coolant accident (LOCA) coincident with a loss of offsite power (LOOP). The Technical Specification (TS) 3.7.3, Action b, allowed outage time (AOT) of 72 hours was exceeded and the attendant shutdown actions were not met. Therefore, this event is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by TS.

CAUSE OF THE EVENT

The root cause is attributed to improper installation of the UC fuses due to inadequate guidance in the 4160 volt breaker operation procedure. A contributing cause is wear on the stabs of the fuse holder due to cyclic stresses.

ANALYSIS OF THE EVENT

Background

The ICW system supplies salt water from the cooling canal system [BS] to the tube side of the Component Cooling Water (CCW) heat exchangers [CC, HX]. CCW is the heat sink for residual heat removal [BP], Chemical and Volume Control System [CB], spent fuel cooling [DA] and various Reactor Coolant System [AB] components. The ICW system also supplies salt water to the cold side of the turbine plant cooling water heat exchangers [KB, HX].

Three ICW pumps are provided for each unit. One, two, or three pumps are operated as required to support normal plant operating conditions. However, only one pump is required following a maximum hypothetical accident. The A and B pumps are powered by 4160 volt buses which can be powered by each train's associated Emergency Diesel Generator (EDG). The C pump is powered by a swing 4160 volt safety related bus which can be powered, through aligning the bus manually, by either the train A or train B EDG associated with the same unit. This pump is interlocked such that it is started on a LOOP or safety injection signal, if the supply breaker for the A or B pump associated with the A or B 4160 volt bus to which it is aligned is open and racked out.

Analysis

The fuse holder assembly consists of two pieces, the fuse holder and the base. The fuse holder is removable. The two fuses (one on the positive side of the power supply and one on the negative side of the power supply) are mounted in the holder, with four long stabs that extend into the base to complete the electrical circuits. The base is mounted to the cubicle, and consists of four short clips, that mate to its corresponding stab. The stabs fit on the inside of the clips on the base. The tension of the clips against the stabs (as well as the complementary curve of both pieces) keeps the fuse holder connected to the base. If all four clips are making good electrical contact with their respective stabs, the fuse holder will be tight in the base and difficult to remove.

There are two types of UC fuse holder assemblies in the GE Magne-Blast 4160 volt breakers. The fuse holder in the 3B ICW pump breaker has been in service for at least 20 years and is likely original plant equipment. Some in-service 4160 volt breaker cubicles have been refitted with a newer fuse holder assembly. The new fuse holder assembly stabs and clips hold more tightly because they have not been subject to as many cycles of removal, reinstallation, and adjustment.

During the cause evaluation, it was discovered that it is possible to insert the fuse holder stabs on the outside of the clips (i.e. between the copper clips and the plastic casing) by approaching the base at a slight angle. Based on walkdowns of the cubicles, the fuse holder assembly is approximately 5 to 6 feet off the ground. With the location of the fuse holder assembly, approaching the fuse holder base at an angle is conceivable. In this installation alignment, the fuse holder stabs are making contact with the copper clips and the white light would be on. As part of preventive maintenance to ensure proper engagement, the copper clips are squeezed slightly, which increases the possibility of widening the gap between the copper clips and the plastic.

Prior to the loss of control power on September 28, 2013, the UC fuses were installed in the 3B ICW pump breaker on September 4, 2013. No other fuse holder manipulations were noted to have occurred between September 4, 2013 and September 28, 2013 and the breaker was cycled closed and open approximately six times. It is judged that during this period the UC fuse holder gradually worked loose due to improper installation and breaker operation vibration to the point where contact between the fuse holder stabs with the base clips was lost. Therefore, the 3B ICW pump breaker would not have been able to open on a LOOP and close for EDG loading from the last pump start on September 24, 2013.

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NARRATIVE

Reportability

TS Limiting Condition for Operation (LCO) 3.7.3.a requires three ICW pumps to be operable in Modes 1-4. If one ICW pump is inoperable, then the AOT is 14 days if both remaining pumps are powered by independent sources. If the remaining two ICW pumps are not powered from independent sources, then the AOT is 72 hours. During the approximate 4 day period September 24, 2013 to early September 29, 2013, with the 3B ICW pump inoperable, the 3A pump was powered via the A 4160 volt bus and the 3C ICW pump was not powered via the B 4160 volt bus because the 3B ICW pump breaker was not open and racked out. Therefore, the 3A and 3C ICW pumps were not independently powered, and so the 72 hour AOT applied. As a result, the TS LCO, AOT and shutdown Actions were not met and a condition prohibited by the TS existed, reportable in accordance with 10 CFR 50.73(a)(2)(i)(B).

ANALYSIS OF SAFETY SIGNIFICANCE

During the approximate 4 day period the 3B ICW pump was inoperable, the 3A and 3C ICW pumps were available to perform the heat removal safety function of the ICW system. The 3B and 3C ICW pumps were aligned to the 3B 4160V safety bus and the capability existed to power the 3C ICW pump should the need have arisen. In addition, it was possible to recover the functionality of the 3B ICW pump by restoring the UC fuse holder in the fuse base. Only one ICW pump in operation is needed to remove design basis heat loads. Therefore, the ICW system remained functional with redundant capability to perform the safety function and so the safety significance is considered to be low.

CORRECTIVE ACTIONS

Corrective actions are in accordance with condition report 1907650 and include the following:

1. UC fuses of adjacent similar breakers were checked following breaker operation.
2. Baseline UC fuse engagement measurements have been taken for 4160 volt breakers.
3. Establish UC fuse holding force inspection acceptance criteria for 4160 volt breakers, perform inspections, and replace fuse holder assemblies as required.
4. Revise 4160 volt breaker operating procedure to provide guidance for ensuring UC fuse holders are tight after installation and perform verification.

ADDITIONAL INFORMATION

EIIS Codes are shown in the format [IEEE system identifier, component function identifier, second component function identifier (if appropriate)].

FAILED COMPONENTS IDENTIFIED: None

PREVIOUS SIMILAR EVENTS: None