Florida Power & Light Company, 6501 S. Ocean Drive, Jensen Beach, FL 34957

FPL

January 29, 2011

L-2011-034
10 CFR 50.73

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

Re: St. Lucie Unit 2
Docket No. 50-389
Reportable Event: 2011-001
Date of Event: December 2, 2010

Inadvertent Crosstie of Component Cooling Water (CCW) to Control Room Air Conditioning (A/C) Units

The attached Licensee Event Report 2011-001 is being submitted pursuant to the requirements of 10 CFR 50.73 to provide notification of the subject event.

Very truly yours,

Richard L. Anderson
Site Vice President
St. Lucie Plant

RLA/dlc

Attachment

IE22
NRR

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)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
St. Lucie Unit 2	05000389	1 OF 5

4. TITLE
Inadvertent Crosstie of Component Cooling Water (CCW) to Control Room A/C Units

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
12	02	2010	2011	- 001 -	00	01	29	2011	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)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☒ 50.73(a)(2)(vii)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
☐ 20.2203(a)(2)(vi)	☒ 50.73(a)(2)(i)(B)	☐ 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)
Don Cecchett	772-467-7155

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
D	CC	HX	W120	Y					

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 December 2, 2010 at 2320 St. Lucie Unit 2 was in Mode 1, while performing Plant Operator daily rounds, it was discovered the Unit 2 component cooling water (CCW) train A and B headers were cross-connected at control room A/C unit HVA/ACC-3C via CCW cooling flow being supplied from the A header and returning to the B header. This condition was a violation of Technical Specification (TS) 3.7.3 and required entry into a 1-hour shutdown action statement in accordance with TS 3.0.3. The Control Room staff immediately realigned CCW to 2-HVA/ACC-3C to Train B; no power reduction was necessary. This event is reportable as a condition prohibited by Technical Specifications, 10CFR50.73 (a) (2) (i) (B) and 10CFR50.73 (a) (2) (vii), a common cause inoperability of independent trains.

A root cause evaluation (RCE) determined the valve misalignment relied on one procedure as the sole configuration control method for the CCW valves to the control room A/C Unit HVA/ACC-3C. Contributing causes included inadequate instructions for verifying CCW valve position to control room A/C unit HVA/ACC-3C by Procedure 2-0010123, "Administrative Control of Valves, Locks and Switches".

Corrective actions included procedure revisions to ensure CCW and ICW valves have positions tracked when transferring the 2AB bus and components from A side to B side and from B side to A side and that locked open / locked closed tags reflect the current alignment of the valves.

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
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NARRATIVE

Description of the Event

On December 2, 2010 at 2320 during the performance of Plant Operator daily rounds, it was discovered that the Unit 2 CCW [EIIS:HX] train A and B headers were cross-connected though control room air conditioning [EIIS:ACU] unit HVA/ACC-3C via CCW cooling flow being supplied to the cooler from the A Header and returning to the B Header. The Control Room and Shift Manager were immediately notified and the misalignment corrected. Cross-connecting CCW trains by opening the supply or return valves [EIIS:FCV] to both trains violates the CCW system design criteria for independent trains and the independence requirement of TS 3.7.3 resulting in a condition prohibited by Technical Specifications.

Cause

On November 8, 2010, an equipment clearance order (ECO) was issued to establish conditions necessary to remove and to replace a vent valve on CCW supply header A to the control room HVA/ACC-3C. At that time CCW to ACC-3C was lined up to its alternate source, Train B. The ECO closed both Train A and Train B CCW supply valves (V14510 and V14506) and the combined discharger header isolation valve SH14265, which isolates both Train A and Train B return lines. During restoration from the ECO on November 10, 2010, CCW supply valves were inadvertently returned to their default position from Train A. However the return valves from Train A and B were not part of the ECO and remained aligned to alternate Train B. This resulted in cross-connecting Train A and B of CCW.

Operations Department Policy OPS-531, "Configuration Control Methods," allows use of a procedure for configuration control if the procedure has steps for restoration; however 2-NOP-52.02 does not have restoration steps. The Root Cause of this event is the Operations Procedure 2-NOP-52.02, "Alignment of 2AB Buses and Components", had been inappropriately used as the sole configuration control method for CCW valves to Control Room Air Conditioning Unit HVA/ACC-3C when CCW to ACC-3C was previously aligned to alternate Train B on May 18, 2010. This procedure was closed out after the re-alignment and a record of the change using an active plant database to track the change in CCW valve positions to the alternate lineup was not made. As a result, the current lineup was not understood when the ECO was subsequently released on November 10, 2010.

The Root Cause of this event is that Operations Procedure 2-NOP-52.02, "Alignment of 2AB Buses and Components", was inappropriately used as the sole configuration control method for CCW valves to Control Room Air Conditioning Unit HVA/ACC-3C. An active plant database should have been used to track the change in CCW valve positions to the alternate lineup. An active plant database should have been used to track the change in CCW valve positions to the alternate lineup.

A contributing cause is inadequate instructions for verifying the position of CCW valves to Control Room Air Conditioning Unit HVA/ACC-3C in Administrative Procedure 2-0010123, "Administrative Control of Valves, Locks and Switches".

NARRATIVE

Analysis of the Event

The inadvertent cross-tie of A and B CCW headers to the control room HVA/ACC-3C found during Plant Operator daily rounds violated the independence requirement of the TS 3.7.3 for two independent CCW headers, which is a condition prohibited by Technical Specifications and reportable under 10CFR50.73(a)(2)(i)(B), and 10CFR50.73 (a) (2) (vii), a common cause of inoperability of independent trains.

The CCW system is a closed loop cooling water system configured with two redundant essential supply header systems (designated 'A' and 'B') each with a pump and heat exchanger and the capability to supply the minimum safety requirements during plant shutdown or design basis accident conditions. The non-essential supply header which is connected to both essential headers during normal operation is automatically isolated from the essential headers by valve closure on a safety injection actuation signal (SIAS). Each essential header alone has the heat removal capacity to safely shutdown the reactor or to mitigate the effects of a design basis accident and is separated from the other essential and non-essential header during accident conditions.

During normal operation, the CCW system provides cooling to components important to safety such as reactor coolant pumps, containment fan coolers, and spent fuel pool heat exchangers. During accident conditions, the CCW system provides cooling for safety related components associated with reactor decay heat removal, containment cooling, and control room habitability.

The three control room air conditioning units are supplied by an essential CCW header. Each essential CCW header is capable of supplying all three A/C units. In order to maintain train separation, essential header 'A' is lined up to supply A/C Unit 3A, which is powered by Train A electrical power, and essential header 'B' is lined up to supply A/C Unit 3B, which is powered by Train B electrical power. A/C Unit 3C is a swing component that can have CCW and electrical power supplied from either Train A or B. In order to maintain train separation, electrical power and CCW must be aligned to the same train. Cross-connecting CCW trains by opening the supply or return valves to both trains violates the CCW system design criteria for independent trains. All valves associated with CCW to the A/C units are manually operated. No indications of CCW alignment to the A/C units are provided in the Control Room or other location.

The normal CCW supply arrangement for A/C 3C is Train A supply valves open, Train B return valves closed. In this event, an ECO was issued to establish the conditions to cut out and replace a vent valve for the CCW supply header A to control room HVA/ACC-3C. This valve was found to have a slow seat leak in July 2002 when upstream isolation valve V14510 was open. The ECO shut CCW supply valves V14510 and V14506 and combined discharger header isolation valve SH14265. However, during restoration of the ECO on November 10, 2010, CCW supply valves were returned to their default position, Train B to Train A. The Train A and B return valves were not part of the ECO and remained aligned to alternate Train B resulting in cross-tying the two trains.

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Analysis of Safety Significance

The inadvertent cross-tie of A and B CCW headers to the control room HVA/ACC-3C found during Plant Operator daily rounds violated the independence requirement of the TS 3.7.3 for two independent CCW headers which is a condition prohibited by Technical Specifications.

An Engineering assessment was performed to determine if any additional risk of core damage exists as a result of cross connecting the essential trains of CCW in this event. The risk was evaluated for both normal operation, from a seismic event causing total loss of CCW due to a break in the cross-tied non-essential header, and during accident conditions from two concurrent initiating events where a postulated LOCA occurs in seismic qualified piping at the same time a seismic event occurs which causes a break in the cross connected non-essential header piping. In both cases the calculated value for incremental core damage probability (ICCDP) was determined to be non-risk significant and below the threshold established in RG-1.174 for risk significance.

Corrective Actions

The corrective actions and supporting actions listed below are entered into the site corrective action program. Any changes to the actions will be managed under the commitment management change program.

Immediate corrective actions taken:

1. The checklist for Operations Policy 520, check sheet 4, "ECO Release Review and Authorization Check List" was modified to ensure the release is consistent with AB buses alignment.(Complete)
2. Station Clock Reset brief was communicated site wide.(Complete)

The following actions will be tracked within the St. Lucie Corrective Action Program:

1. Revise Operations Procedure 2-NOP-52.02 to ensure CCW and ICW valves (including V14510, V14518, V14514, V14506, MV-14-1, MV-14-2, MV-14-3, MV-14-4, SB21165 and SB21211) have positions tracked in electronic shift operations management system (eSOMS) when transferring 2AB buses and components from A side to B side and from B side to A side.

2. Revise AP-1[2]-0010123 to remove the default positions of CCW valves V14510, V14518, V14514, V14506 and the other valves marked with an asterisk (*) that have the note similar to, "The position of these valves may change due to plant conditions."

NARRATIVE

3. Revise the following procedures to highlight the required configuration control method for the identified swing components:
   - 1[2]-NOP-14.02
     - V14510 (Unit 2 only), V14518 (Unit 2 only), V14514 (Unit 2 only)
     - V14506 (Unit 2 only), MV-14-1, MV-14-2, MV-14-3, MV-14-4
   - 1[2]-NOP-21.01A, B, C,
     - SH21165, SH21211
   - 1-NOP-52.02,
     - MV-14-1, MV-14-2, MV-14-3, MV-14-4, SH21165,
     - SH21211
4. Perform a "training needs analysis" to determine what additional SRO and SNPO training is needed to address AB bus swing components and configuration control related to this event.

Similar Events

A review of external operating experience (OE) was completed. Several examples were identified including significant operating event report (SOER), SOER 98-1, "Safety System Status Control" Corrective actions taken or planned for this SOER are currently in our corrective action program (CAP) and will be reviewed to ensure they are effectively implemented and will prevent recurrence of similar problems.

A review of the St. Lucie CAP data base for similar events found there were no significant PSL events during the past 3 years where an equipment clearance was released as prescribed but in conflict with the existing system lineup which could have resulted in system inoperability.

Failed Components

NA