



Crystal River Nuclear Plant
Docket No. 50-302
Operating License No. DPR-72

Ref: 10 CFR 50.73

March 22, 2004
3F0304-08

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

Subject: LICENSEE EVENT REPORT 50-302/03-005-01

Reference: LICENSEE EVENT REPORT 50-302/03-005-00, dated December 9, 2003

Dear Sir:

Please find enclosed a voluntary revision to Licensee Event Report (LER) 50-302/03-005-00. LER 50-302/03-005-01 corrects the component identification number for the "B" Main Feedwater Pump throughout the LER. A component identification number of FWP-1B ("B" Feedwater Booster Pump) was incorrectly referenced instead of the correct component identification number of FWP-2B. This report is being submitted pursuant to 10CFR50.73(a)(2)(iv)(A).

No new regulatory commitments are made in this letter.

If you have any questions regarding this submittal, please contact Mr. Sid Powell, Supervisor, Licensing and Regulatory Programs at (352) 563-4883.

Sincerely,

Jon A. Franke
Plant General Manager
Crystal River Nuclear Plant

JAF/dwh

Enclosure

xc: Regional Administrator, Region II
Senior Resident Inspector
NRR Project Manager

Progress Energy Florida, Inc.
Crystal River Nuclear Plant
15760 W. Powerline Street
Crystal River, FL 34428

JE22

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 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@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 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 CRYSTAL RIVER UNIT 3	2. DOCKET NUMBER 05000 302	3. PAGE 1 OF 6
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4. TITLE
Reactor Trip Caused By Loss Of Feedwater While Troubleshooting Feedwater Pump Control Problems

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTI AL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
11	05	2003	03	- 005	- 01	03	22	2004	FACILITY NAME	DOCKET NUMBER
										05000
										05000

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)									
10. POWER LEVEL 37%	20.2201(b)	20.2203(a)(3)(ii)	50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)						
	20.2201(d)	20.2203(a)(4)	50.73(a)(2)(iii)	50.73(a)(2)(x)						
	20.2203(a)(1)	50.36(c)(1)(i)(A)	X 50.73(a)(2)(iv)(A)	73.71(a)(4)						
	20.2203(a)(2)(i)	50.36(c)(1)(ii)(A)	50.73(a)(2)(v)(A)	73.71(a)(5)						
	20.2203(a)(2)(ii)	50.36(c)(2)	50.73(a)(2)(v)(B)	OTHER Specify in Abstract below or in NRC Form 366A						
	20.2203(a)(2)(iii)	50.46(a)(3)(ii)	50.73(a)(2)(v)(C)							
	20.2203(a)(2)(iv)	50.73(a)(2)(i)(A)	50.73(a)(2)(v)(D)							
	20.2203(a)(2)(v)	50.73(a)(2)(i)(B)	50.73(a)(2)(vii)							
	20.2203(a)(2)(vi)	50.73(a)(2)(i)(C)	50.73(a)(2)(viii)(A)							
	20.2203(a)(3)(i)	50.73(a)(2)(ii)(A)	50.73(a)(2)(viii)(B)							

12. LICENSEE CONTACT FOR THIS LER

NAME Dennis W. Herrin, Lead Engineer	TELEPHONE NUMBER (Include Area Code) (352) 563-4633
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

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

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

At 17:34, on November 5, 2003, Progress Energy Florida, Inc., (PEF) Crystal River Unit 3 (CR-3) was in MODE 1 (POWER OPERATION) at approximately 37 percent RATED THERMAL POWER. While troubleshooting problems with the "B" Main Feedwater Pump (FWP-2B) control circuits, a feedwater transient occurred that resulted in an automatic reactor trip. When FWP-2B was placed in automatic, the control signal to the pump decreased significantly. This caused a loss of feedwater flow to both Once Through Steam Generators (OTSGs). Operators attempted to restore feedwater flow by placing FWP-2B back in manual and raising the set point of both feedwater pump controllers. As OTSG level continued to decrease, Reactor Coolant System (RCS) pressure and temperature increased. An automatic reactor trip occurred on high RCS pressure. An automatic Emergency Feedwater (EFW) System actuation occurred on low OTSG levels. The cause for this event was human error associated with not verifying the correct circuit cards were installed in the Integrated Control System (ICS) during the recent refueling outage. The correct circuit cards were installed in the ICS to correct the problem. Reactor Protection System and EFW System actuation are reportable under 10CFR50.73(a)(2)(iv)(A). This condition does not represent a reduction in the public health and safety. No previous similar occurrences have been reported to the NRC by CR-3.

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

EVENT DESCRIPTION

At 17:34, on November 5, 2003, Progress Energy Florida, Inc., (PEF) Crystal River Unit 3 (CR-3) was in MODE 1 (POWER OPERATION) at approximately 37 percent RATED THERMAL POWER. While troubleshooting problems with the "B" Main Feedwater Pump (FWP-2B) [SJ, P] control circuits [JK, 65], a feedwater transient occurred that resulted in an automatic reactor trip.

CR-3 was starting up from a refueling outage. As part of returning the plant to service, tuning of the feedwater pumps and checkout of the Integrated Control System (ICS) [JA] was being performed. Difficulties were encountered in tuning FWP-2B control circuits. Both main feedwater pumps were in manual operation while troubleshooting was being performed on FWP-2B governor control circuitry. At 17:33:53, FWP-2B was placed in automatic. The control signal to the pump decreased significantly. This caused a loss of feedwater flow to both Once Through Steam Generators (OTSGs) [AB, SG]. At 17:33:57, Operators attempted to restore feedwater flow by placing FWP-2B back in manual and raising the set point of both feedwater pump controllers. As OTSG level continued to decrease, Reactor Coolant System (RCS) [AB] pressure and temperature increased due to loss of the heat sink. At 17:34:10, an automatic reactor trip occurred on high RCS pressure before a manual reactor trip could be initiated. At 17:34:18, an automatic Emergency Feedwater (EFW) System [BA] actuation occurred on low OTSG levels.

Besides troubleshooting FWP-2B, no structures, systems or components were inoperable at the start of the event that contributed to the event. Plant systems operated normally during the reactor trip with exception of the "D" bank of pressurizer [AB, PZR] heaters [AB, EHTR] that did not energize automatically on a Low RCS Pressure signal. The "D" bank of pressurizer heaters did operate in manual.

Actuation of the Reactor Protection System (RPS) [JC] and EFW System is reportable to the NRC. At 19:31, on November 5, 2003, a non-emergency four-hour notification and a non-emergency eight-hour notification was made to the NRC Operations Center (Event Number 40299) in accordance with 10CFR50.72(b)(2)(iv)(B) and 10CFR50.72(b)(3)(iv)(A), respectively. This report is being submitted pursuant to 10CFR50.73(a)(2)(iv)(A).

SAFETY CONSEQUENCES

Based on the loss of feedwater transient, valid actuation of the RPS and EFW System occurred as expected to shut down the reactor and maintain adequate OTSG levels. When the feedwater flow decreased, an automatic reactor trip occurred on high RCS pressure. An automatic Emergency Feedwater System actuation occurred on low OTSG levels. Reactor operators properly executed the Emergency Operating Procedures for plant shutdown.

Based on the above discussion, PEF concludes that actuation of the RPS and EFW System did not represent a reduction in the public health and safety. This event does not meet the Nuclear Energy Institute definition of a Safety System Functional Failure (NEI 99-02, Revision 2).

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CAUSE

The cause for this event was human error associated with not verifying the correct circuit cards [JA, IMOD] were being installed in the ICS during the recent refueling outage. (The ICS coordinates the reactor, steam generator feedwater control and main turbine under all operating conditions.) CR-3 Maintenance technicians did not verify that the circuit cards being installed were like-for-like replacement of the existing circuit cards identified as having failed. Part numbers, nomenclature and component layout were obvious differences between the circuit cards believed to have failed and the ones that were subsequently installed.

A contributing cause for this event was the identification of good circuit cards as being failed during the Preventive Maintenance (PM) testing. PM testing is performed on the ICS during each refueling outage to ensure circuit card drift and masked failures are not occurring that could pose a challenge to plant operations. Approximately fifty percent of the circuit cards are checked. Circuit card testing involves removing the circuit card from the ICS cabinet, inserting the circuit card into a test rack and testing the circuit card for proper response. On October 18, 2003, a qualified CR-3 Maintenance Technician was performing PM testing activities on backshift to check the response of transfer relay circuit cards. The Technician noted that transfer relay circuit cards did not change state as required by the Calibration Data Sheets and decided that the circuit cards were faulty and needed to be replaced. The circuit cards were actually working as designed in that the circuit card included a time delay that is necessary for correct circuit operation. The Technician mistakenly assumed that since the circuit cards were not immediately changing state that they were defective. The Technician did not recognize that the transfer relay circuit cards being tested were unique in that they included a time delay. The Technician is the subject matter expert for the ICS and has tested time delay transfer relay circuit cards in the past. Additionally, the Calibration Data Sheets identified the subject transfer relay circuit cards as having a time delay.

A second contributing cause for this event was the ordering of replacement parts. The CR-3 Maintenance Planner did not perform the required verifications to ensure that plant configuration would be maintained. The Planner relied upon the expertise of the Technician to ensure that correct circuit cards were being installed in the ICS and did not verify which circuit cards were actually being replaced. The Passport Equipment Data Base includes the correct part numbers for the ICS circuit cards. The part numbers can then be used to order the correct parts from the warehouse.

Troubleshooting was under way at the time of the event because FWP-2B was not able to be tuned. Power supplies had been installed during the refueling outage to improve reliability of the Woodward electronic controllers. During troubleshooting subsequent to the plant trip, Contractor Technical Support was brought on site to assist. The contractor recommended removing the new power supplies and reinstalling the original power supplies. The new power supplies may have contributed to the FWP-2B control problems, but did not cause the loss of feedwater or the plant trip when FWP-2B was placed in automatic.

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

CORRECTIVE ACTIONS

1. CR-3 Administrative Instruction AI-704, "Reactor Trip Review and Analysis," was performed.
2. A total of three transfer relay circuit cards were thought to have failed due to not recognizing that a time delay was included as part of the circuit card design and were replaced with incorrect circuit cards. These incorrect circuit cards have been replaced with the correct circuit cards that include the time delay function. Other circuit cards that were replaced during the refueling outage as part of the ICS preventive maintenance were reviewed to ensure the correct cards were installed. No other instances of incorrect circuit cards being installed were noted.
3. Other actions associated with this event are being addressed in the CR-3 Corrective Action Program in Nuclear Condition Report 110023.

PREVIOUS SIMILAR EVENTS

No previous similar events involving installation of incorrect replacement parts in the ICS have been reported to the NRC by CR-3.

ATTACHMENTS

- Attachment 1 - Abbreviations, Definitions, and Acronyms
- Attachment 2 - List of Commitments

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ATTACHMENT 1

ABBREVIATIONS, DEFINITIONS AND ACRONYMS

- AI Administrative Instruction
- CFR Code of Federal Regulations
- CR-3 Crystal River Unit 3
- EFW Emergency Feedwater
- FWP Feedwater Pump
- ICS Integrated Control System
- NEI Nuclear Energy Institute
- NRC Nuclear Regulatory Commission
- OTSG Once Through Steam Generator
- PEF Progress Energy Florida, Inc.
- PM Preventive Maintenance
- RCS Reactor Coolant System
- RPS Reactor Protection System

NOTES: Improved Technical Specifications defined terms appear capitalized in LER text {e.g., MODE 1}

Defined terms/acronyms/abbreviations appear in parenthesis when first used {e.g., Reactor Building (RB)}.

EIIS codes appear in square brackets {e.g., reactor building penetration [NH, PEN]}.

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ATTACHMENT 2

LIST OF COMMITMENTS

The following table identifies those actions committed to by PEF in this document. Any other actions discussed in the submittal represent intended or planned actions by PEF. They are described to the NRC for the NRC's information and are not regulatory commitments. Please notify the Supervisor, Licensing & Regulatory Programs of any questions regarding this document or any associated regulatory commitments.

RESPONSE SECTION	COMMITMENT	DUE DATE
	No regulatory commitments are being made in this submittal.	