



**Florida
Power**

CORPORATION
Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72

October 29, 1999
3F1099-23

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

Subject: Licensee Event Report (LER) 50-302/99-004-00

Dear Sir:

Please find attached Licensee Event Report (LER) 50-302/99-004-00. This LER discusses an unplanned actuation of the Emergency Feedwater System that occurred during a refueling shutdown. This report is being submitted pursuant to 10CFR50.73(a)(2)(iv).

If you have any questions concerning this submittal, please contact Mr. Larry McDougal, Manager, Nuclear Regulatory Compliance, at (352) 563-4988.

Sincerely,

D. L. Roderick
Director
Nuclear Engineering and Projects

DLR/rlm

Attachment

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

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION (6-1998)	APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001 <small>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.</small>
LICENSEE EVENT REPORT (LER)	

FACILITY NAME (1) CRYSTAL RIVER UNIT 3	DOCKET NUMBER (2) 05000302	PAGE (3) 1 OF 5
--	--------------------------------------	---------------------------

TITLE (4)
 Main Feedwater Pump Trip During Refueling Shutdown Results In Emergency Feedwater Actuation

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
10	01	99	99	-- 004 --	00	10	29	99	FACILITY NAME	DOCKET NUMBER
OPERATING MODE (9)			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
2			20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)	
POWER LEVEL (10)			20.2203(a)(1)		20.2203(a)(3)(I)		50.73(a)(2)(iii)		50.73(a)(2)(x)	
005			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)		<input checked="" type="checkbox"/> 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 Robert L. McLaughlin, Sr. Regulatory Specialist	TELEPHONE NUMBER (Include Area Code) (352) 795-6486
--	---

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
<input checked="" type="checkbox"/> YES <small>(If yes, complete EXPECTED SUBMISSION DATE).</small>	X	<input type="checkbox"/> NO						

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

On October 1, 1999, Florida Power Corporation's Crystal River Unit 3 (CR-3) was reducing power in preparation for a refueling outage. At less than five percent RATED THERMAL POWER, a trip occurred of the operating main feedwater (FW) pump. The loss of main FW resulted in actuation of Emergency Feedwater (EFW). The FW pump trip was caused by an overspeed condition of the pump turbine. A conclusive cause for the pump trip has not been established. Steam cuts were found on the seat of the high pressure control valve that may have been sufficient to overspeed the pump turbine when a steam pressure transient occurred while transferring the steam supply. EFW actuated appropriately and operated as designed. This event had no impact on the public health and safety. Immediate corrective actions included repair of the damaged components and have been completed.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)				PAGE (3)
CRYSTAL RIVER UNIT 3	05000302	YEAR	SEQUENTIAL NUMBER		REVISION NUMBER	2 OF 5
		99	--	004	--	00

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

DESCRIPTION

At approximately 1600 on September 30, 1999, Florida Power Corporation's (FPC) Crystal River Unit 3 (CR-3) commenced reducing reactor power in preparation for a scheduled refueling outage. At 0001 on October 1, 1999, the output breakers were opened and the plant turbine generator was taken off line. At 0110, CR-3 entered MODE 2 (STARTUP) at five percent RATED THERMAL POWER. At approximately 0113 on October 1, 1999, a trip of the operating main feedwater pump [SJ, P](FWP-2A) occurred. The loss of main feedwater to the Once Through Steam Generators [AB, HX](OTSG) resulted in an actuation of the Emergency Feedwater [BA](EFW) System. The EFW System operated as designed. CR-3 did not experience any abnormal OTSG level changes or problems with other plant equipment. The alternate main feedwater pump (FWP-2B) was started at approximately 0153 and EFW was secured at approximately 0300.

This event was verbally reported under 10CFR50.72(b)(2)(ii) (Event Number 36250) at 0351 on October 1, 1999, and is being reported in accordance with 10CFR50.73(a)(2)(iv).

EVALUATION

The main feedwater pumps are steam-turbine driven and are utilized during start-up, operation and cooldown. The main feedwater pump turbines start on Auxiliary Steam, and normally operate on Hot Reheat Steam. During normal cooldown, one main feedwater pump is stopped when a single pump is adequate to meet feedwater demand, and the second main feedwater pump is stopped after system pressure decreases to the point that the feedwater booster pumps alone can meet the feedwater demand.

The EFW System is designed to provide a safety grade heat sink for core decay heat removal. The Design Basis Accident which forms the basis for initiation of EFW is a loss of main feedwater transient. In the analysis of this transient, OTSG Level-Low is the parameter conservatively assumed to be the initiator of EFW. Loss of both main feedwater pumps is a direct and immediate indicator of loss of main feedwater.

In this event, EFW actuated appropriately on loss of main feedwater and operated as designed. CR-3 did not experience any abnormal OTSG level changes or problems with other plant equipment. This event had no impact on the public health and safety. This event did not involve a Safety System Functional Failure.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)				PAGE (3)
CRYSTAL RIVER UNIT 3	05000302	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 OF 5	
		99	-- 004 --	00		

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

CAUSE

FWP-2A tripped due to an overspeed condition of the pump turbine. Tests and inspections of various pump and valve controls have not indicated a conclusive single cause for the pump trip. However, severe steam cuts were found on the seat of the high pressure control valve. The condition of the seat was observed by the turbine vendor. The assessment was that this condition may have been sufficient to overspeed the turbine when a steam pressure transient occurred at this low power level. This transient occurred while transferring the Auxiliary Steam supply from CR-3 to CR-1 /2. Although the vendor indicated this pressure transient should have easily been controlled by the turbine governor system, the transient initially slowed the turbine, which then overshot when regaining speed due to the steam cuts and the low power level.

CORRECTIVE ACTIONS

Immediate corrective actions included repair of the damaged components and have been completed. Several potential causes for the pump trip, including the cause for the previous event noted below, were considered and eliminated. Preventive maintenance tests are planned as part of the normal plant startup sequence. These tests may help determine whether other contributing causes existed. Additional corrective actions will be completed in accordance with CR-3's Corrective Action Program.

PREVIOUS SIMILAR EVENTS

The following Reports have been issued for similar events involving Emergency Feedwater Actuation caused by Main Feedwater Pump trips:

LER 86-21-00 Emergency Feedwater Actuation On Low Steam Generator Level Due To Interruption Of Steam Flow To The Operating Main Feedwater Pump.

ATTACHMENTS

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

LICENSEE EVENT REPORT (LER)

TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)				PAGE (3)
CRYSTAL RIVER UNIT 3	05000302	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 5	
		99	-- 004 --	00		

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

ATTACHMENT 1

ABBREVIATIONS, DEFINITIONS, AND ACRONYMS

- 10CFR Title 10 of the Code of Federal Regulations
- CR-3 Crystal River Unit 3
- EFIC Emergency Feedwater Initiation and Control
- EFW Emergency Feedwater System
- FPC Florida Power Corporation
- FWP Main Feedwater Pump
- LER Licensee Event Report
- MFW Main Feedwater System
- OTSG Once Through Steam Generator

Note: Improved Technical Specifications terms appear in capitalization in the text of the LER. EIS Codes appear in square brackets. Defined terms/acronyms/abbreviations appear in parentheses when first used.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
CRYSTAL RIVER UNIT 3	05000302	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	5 OF 5
		99	-- 004 --	00	

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

ATTACHMENT 2

List of Regulatory Commitments

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