



Florida Power

CORPORATION
Crystal River Unit 3
Docket No. 95-302

September 29, 1995
3F0995-13

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

Subject: Licensee Event Report (LER) 95-016-00

Dear Sir:

Please find the enclosed Licensee Event Report (LER) 95-016-00. This report is submitted by Florida Power Corporation in accordance with 10 CFR 50.73.

Sincerely,

Ron Davis FOR B.J. HICKLE

B. J. Hickle, Director
Nuclear Plant Operations

JAF:ff

Attachment

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

020071

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LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HOURS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (MNBB 7714), 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.

FACILITY NAME (1) CRYSTAL RIVER UNIT 3 (CR-3)						DOCKET NUMBER (2) 0 5 0 0 0 3 0 2			PAGE (3) 1 OF 0 7		
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TITLE (4)
Revised Calculations Lead to Non-Conservative EFIC Setpoint Resulting in Operation Outside the Design Basis

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 NAMES			DOCKET NUMBER(S)														
0	8	3	1	9	5	9	5	0	1	6	0	0	0	0	9	2	9	9	5	N/A	0	5	0	0	0	0

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (CHECK ONE OR MORE OF THE FOLLOWING) (11)												
POWER LEVEL (10) 1 0 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)									
	20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)									
	20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 365A)									
	20.405(a)(1)(iii)	50.3(a)(2)(i)	50.73(a)(2)(viii)(A)										
	20.405(a)(1)(iv)	X 50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)										
	20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)										

LICENSEE CONTACT FOR THIS LER (12)

NAME J. A. Frijouf, Nuclear Regulatory Specialist	TELEPHONE NUMBER AREA CODE 9 0 4 5 6 3 - 4 7 5 4
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)

<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On August 31, 1995, Florida Power Corporation's (FPC) Crystal River Unit 3 was in MODE ONE (POWER OPERATIONS) operating at 100% RATED THERMAL POWER and generating 872 megawatts. It was determined by FPC personnel that the Emergency Feedwater Initiation and Control (EFIC) system natural circulation steam generator level control setpoint was non-conservative relative to new Analysis/Calculation values.

At 1500, an Operability Assessment Committee was convened and determined that the Emergency Feedwater system remained OPERABLE and would function as required by the Improved Technical Specifications. At 1551 on August 31, 1995, in accordance with the requirements of 10 CFR 50.72, FPC notified the Nuclear Regulatory Commission of this event, which was assigned the event number 29266. This report is submitted in accordance with 10 CFR 50.73(a)(2)(ii)(B) for operation outside the design basis of the plant.

The cause of this event was a change in the methodology used by FPC personnel for setpoint determination. Corrective action will include changing the EFIC system control setpoint. Appropriate procedures will be revised and instrument string calibrations will be performed.

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TEXT CONTINUATION

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TEXT (If more space is required, Use additional NRC Form 366A's (17))

EVENT DESCRIPTION

On August 31, 1995, Florida Power Corporation's (FPC) Crystal River Unit 3 (CR-3) was in MODE ONE (POWER OPERATIONS) operating at 100% RATED THERMAL POWER (RTP) and generating 872 megawatts. At that time, it was determined by FPC personnel that the Emergency Feedwater Initiation and Control [BA](EFIC) system natural circulation steam generator level control setpoint was non-conservative relative to new Analysis/Calculation values.

Natural circulation occurs in the Reactor Coolant System [AB](RCS) if the Reactor Coolant Pumps [AB,P](RCP) are not operating and certain other conditions are satisfied. These conditions include having: 1) the heat source at a lower elevation than the heat sink; 2) a solid RCS loop; and 3) Emergency Feedwater [BA](EFW) controlled at a predetermined level in the Once Through Steam Generator [AB,SG](OTSG).

FPC Licensee Event Report (LER) 94-006-03 reported (based on new analysis/calculation methodology) non-conservative setpoints associated with several systems. These systems included the Reactor Protection System [JC](RPS), the Engineered Safeguards Actuation System [JE](ESAS), and the EFIC system. Included in the corrective action plan for that LER were actions to fully evaluate EFIC system setpoints.

During this on-going evaluation, the CR-3 Team reviewed the EFIC Level Instrumentation Setpoint Calculation (I93-0002 Rev. 0). Based on the new methodology, it was determined that the present control setpoint for EFIC natural circulation was non-conservative with respect to the new Analysis/Calculation values.

The new methodology is based on guidance provided in Instrument Society of America (ISA) standard RP67.04, Part II, "Setpoints for Nuclear Safety-Related Instrumentation," which was approved by the ISA in September 1994. This methodology was unavailable when the original setpoints were developed. It was expected that the setpoints using the newer methodology would differ from those developed using the original methodology.

At 1500 on August 31, 1995, an Operability Assessment Committee (OAC) was convened to evaluate the current event. The OAC determined that the EFW remained OPERABLE and would function as required by the Improved Technical Specifications (ITS) since the Emergency Operating Procedures (EOP) contain sufficient guidance to assist in the establishment of natural circulation. ITS does not address EFIC natural circulation. It was determined that this event constituted operation outside the design basis of the plant as defined in 10 CFR 50.72.

At 1551 on August 31, 1995, in accordance with the requirements of 10 CFR 50.72, FPC notified the Nuclear Regulatory Commission (NRC) of this event, which was

EXPIRES 5/31/96

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assigned the event number 29266. This report is submitted in accordance with 10 CFR 50.73(a)(2)(ii)(B) for operation outside the design basis of the plant.

EVENT EVALUATION

The EFIC system is designed to initiate EFW flow based on plant conditions. It initiates EFW by starting pumps and opening block valves to provide a flow path from the EFW storage tank [BA,TK] to the OTSGs. It then controls flow rate in order to maintain water level in the OTSGs. The system is designed to provide the following functions:

1. Initiate EFW;
2. Control OTSG level at one of three setpoints:
 - a. The normal low level setpoint,
 - b. The natural circulation setpoint, or
 - c. The inadequate core cooling setpoint;
3. Provide a flow path to at least one OTSG; and
4. Provide isolation for main steam line and main feedwater line breaks.

The EFIC system consists of four channels. Each channel receives analog input signals from dedicated level and pressure instruments associated with each OTSG. The system will actuate based on one of the following conditions:

1. Detection of low level in either OTSG;
2. Loss of both main feedwater pumps;
3. Detection of the loss of all RCPs;
4. Low pressure in either OTSG;
5. Anticipated Transient Without Scram Mitigation System Actuation Circuitry (ATWS/AMSAC) actuation;
6. High pressure injection (HPI) on both A and B ESAS channels.

LER 94-006-03 reported non-conservative setpoints associated with several systems, including the EFIC system. The deficiencies identified in that LER have resulted in FPC performing Analysis/Calculations utilizing the new methodology for all pertinent EFIC setpoints. All EFIC setpoints have now been subjected to analysis based on the new methodology. Upon completion of the corrective actions associated with both LER 95-015 and the current LER, all corrective actions relative to EFIC setpoints will be completed.

During the course of the Analysis/Calculation CR-3 personnel were involved in several iterations of data gathering from the Nuclear Steam Supply System (NSSS) vendor. It was first determined that the minimum required OTSG level for natural circulation was 240 inches (in.), not including instrument error. The level control setpoint currently in effect is 281 in. Subsequently, it was determined that a later NSSS vendor analysis established a minimum required OTSG level of

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248.4 in. for natural circulation. When the new Analysis/Calculation methodology was applied to the 248.4 in. value, the instrument error corrected value was determined to be 316 in.

The difference between the present setpoint of 281 in. and the new setpoint of 316 in. may appear to be substantial. However, the present EOPs have sufficient guidance to assure the establishment of natural circulation upon the loss of all four RCPs, thereby mitigating the effects of a postulated event.

ITS does not address EFIC natural circulation, however Final Safety Analysis Report (FSAR) Chapter 14, Section 14.1.2.6 Loss-of-Coolant-Flow Accident does address natural circulation. The loss of all four RCPs and subsequent necessity to establish natural circulation is an FSAR analyzed accident. An extensive analysis, combined with preparation, procedures, and training have been established to address this condition in the event that it would occur. CR-3 control room operator training, including simulator training, addresses this issue, in addition to the guidance provided in the current EOPs.

Based on the combination of extensive training, preparation, and procedures addressing mitigation of this event by operations personnel, FPC has determined that this event did not pose any credible threat to the safety of the plant and therefore, did not compromise the health and safety of the general public.

CAUSE

The primary cause was a change in the methodology used by FPC for instrument setpoint determination. This is based on problems identified in 1994 and reported in LER 94-006-03 relative to RPS, ESAS, and EFIC setpoints being set non-conservatively in surveillance procedures. FPC has undertaken a program to expand the scope of the Analysis/Calculations to correct the deficiency. This program is using a different methodology based on ISA RP67.04 Part II. This methodology was unavailable when the original Analysis/Calculations were developed.

IMMEDIATE CORRECTIVE ACTION

1. A formal operability evaluation was conducted in accordance with NOD-14, "Evaluating Operability and Determining Safety Function Status." This activity was completed on August 31, 1995. This evaluation determined that the EFIC system remained operable and would function as required by the ITS.
2. A Short Term Instruction (STI) has been issued to operations personnel to change the EOP setpoint for maintaining natural circulation.

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ADDITIONAL CORRECTIVE ACTION

The EFIC system setpoint for natural circulation will be changed to reflect the revised calculations during the Refuel 10 outage.

ACTION TO PREVENT RECURRENCE

Appropriate procedures will be revised and instrument string calibrations will be performed. The procedures will be revised prior to their next performance.

PREVIOUS SIMILAR EVENTS

There have been four previous reportable events involving EFIC system calibration issues. LER 83-039 reported eleven instruments out of calibration, including EFIC system instruments. LER 88-008 involved EFIC level transmitters exceeding "as-found" surveillance tolerances. LER 94-006 addressed instrument error involving the EFW vector valve control, OTSG differential high pressure setpoint. LER 95-015 reported that the EFIC system low OTSG level initiation bistable setpoints were non-conservative relative to the design setpoints.

ATTACHMENT

Attachment 1 -Abbreviations, Definitions and Acronymns

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ATTACHMENT 1 - ABBREVIATIONS, DEFINITIONS AND ACRONYMS

- AMSAC ATWS Mitigation System Actuation Circuitry
- ATWS Anticipated Transient Without Scram
- CR-3 Crystal River Unit 3
- EFIC Emergency Feedwater Initiation & Control
- EFW Emergency Feedwater
- EOP Emergency Operating Procedures
- ESAS Engineered Safeguards Actuation System
- FPC Florida Power Corporation
- FSAR Final Safety Analysis Report
- I93-0002 EFIC Level Instrumentation Setpoint Calculation
- IN. Inches
- ISA Instrument Society of America
- LER Licensee Event Report
- MODE ONE POWER OPERATION (Greater Than 5 Percent Rated Thermal Power)
- NOD-14 Evaluating Operability and Determining Safety Function Status (procedure)
- NRC Nuclear Regulatory Commission
- NSSS Nuclear Steam Supply System
- OAC Operations Assessment Committee
- OTSG Once Through Steam Generator
- RCP Reactor Coolant Pump
- RCS Reactor Coolant System

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RP67.04 Setpoints for Nuclear Safety-Related Instrumentation
Part II (standard)

RPS Reactor Protection System

RTP RATED THERMAL POWER

NOTES: ITS defined terms appear capitalized in LER text (e.g. MODE ONE)

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

EIIS codes appear in square brackets (e.g. Makeup Tank [CB,TK])