



Florida Power

CORPORATION
Crystal River Unit 3
Docket No. 95-302

September 28, 1995
3F0995-08

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

Subject: Licensee Event Report (LER) 95-015-00

Dear Sir:

Please find the enclosed Licensee Event Report (LER) 95-015-00. This report is submitted by Florida Power Corporation in accordance with 10 CFR 50.73.

Sincerely,

Ron Davis FOR BT HICKLE

B. J. Hickle, Director
Nuclear Plant Operations

JAF:ff

Attachment

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

020072

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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 Entry into ITS 3.0.3

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 N/A			DOCKET NUMBER(S) 0 5 0 0 0		
0 8 3 0 9 5	9 5	9 5	0 1 5	0 0	0 0	0 9 2 8 9 5	N/A			0 5 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 366A)				
	20.405(a)(1)(iii)	X	50.73(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)

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

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

On August 30, 1995, Florida Power Corporation's (FPC) Crystal River Unit 3 was in MODE ONE (POWER OPERATIONS) operating at 100% RATED THERMAL POWER (RTP) and generating 870 megawatts. It was determined by FPC personnel that the setpoint in use for the Emergency Feedwater Initiation and Control (EFIC) system low level initiation bistable was non-conservative relative to a new Analysis/Calculation value.

At 1145, FPC personnel determined that all four EFIC channels were inoperable constituting operation outside the design basis. Improved Technical Specification (ITS) 3.3.11 prohibits this condition. ITS Limiting Condition for Operation (LCO) 3.0.3 was applicable and required the plant to begin shutdown within one hour and to be in MODE THREE (HOT STANDBY) within seven hours. At 1533, the four EFIC channel setpoints were adjusted to their revised setpoint and power reduction was stopped at 40% RTP. ITS 3.0.3 was exited and at 0645 on August 31, 1995, CR-3 had returned to 100% RTP.

The cause of this event was a change in the methodology used by FPC engineering personnel for instrument string error analysis. The immediate Corrective action included changing the EFIC system bistable setpoints. Additionally, appropriate procedures will be revised, and string recalibrations, which require an outage, will be performed.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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.

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

EVENT DESCRIPTION

On August 30, 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 870 megawatts. At that time, it was determined by FPC personnel that the setpoint in use for the Emergency Feedwater Initiation and Control [BA](EFIC) system low level initiation bistable was non-conservative relative to new Analysis/Calculation values.

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: 1) Complete the EFIC Once Through Steam Generator [AB,SG](OTSG) level calculation; and 2) Identify any procedures or plant setpoints that require immediate revision based on the results of the EFIC OTSG level low calculation.

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 setpoint for EFIC low level initiation was non-conservative with respect to the new Analysis/Calculation value. At that time the Nuclear Regulatory Commission (NRC) Resident Inspector was apprised of the status of the setpoint issue.

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 therefore expected that the setpoints using the newer methodology would differ from those developed using the original methodology.

At 1145, on August 30, 1995, FPC personnel determined that all four EFIC channels were inoperable constituting operation outside the design basis. Additionally, Improved Technical Specification (ITS) 3.3.11 prohibits this condition, thereby placing CR-3 in ITS Limiting Condition for Operation (LCO) 3.0.3. ITS LCO 3.0.3 requires the plant to begin shutdown within one hour and to be in MODE THREE (HOT STANDBY) within seven hours.

At 1155, CR-3 control room operators initiated a power reduction and a dedicated watch was assigned to continuously monitor the OTSG level. At 1216 on August 30, 1995, in accordance with the requirements of 10 CFR 50.72 for operation outside the design basis of the plant and as an ITS required shutdown, FPC notified the NRC of this event, which was assigned the event number 29261.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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

Instrument & Controls (I&C) personnel performed revised surveillance procedure SP-146A "EFIC Monthly Functional Test" for the purpose of resetting the EFIC low level initiate signal from the original 6 inch (in.) level to the new setpoint of 11 in., as established by the new setpoint determination methodology.

At 1526, power reduction was stopped at 40% RTP and ITS 3.0.3 was exited when three of four EFIC channel setpoints were adjusted to the correct value. At that time, ITS 3.3.11, Condition A was in effect. This condition allows one EFIC channel to be inoperable. At 1533, ITS 3.3.11, Condition A was exited as the final EFIC channel setpoint adjustment was completed. At 1610, reactor power escalation began at a rate of less than 10% per hour. At 0645 on August 31, 1995, CR-3 had returned to 100% RTP.

This report is submitted in accordance with 10 CFR 50.73(a)(2)(ii)(B) for operation outside the design basis of the plant and 10 CFR 50.73(a)(2)(i)(B) for any operation or condition prohibited by the plant's ITS.

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 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; and
6. High pressure injection (HPI) on both A and B ESAS channels.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 60.0 HOURS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20565-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON DC 20503.

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

Four EFIC dedicated low range level transmitters per OTSG are used to generate the signals used for the detection of low level conditions and the subsequent initiation of EFW on low OTSG level. It is desirable to place the low level setpoint as low as possible, considering instrument errors, to allow the maximum margin between the Integrated Control System (ICS) low load control setpoint and the EFIC low level initiation setpoint. To meet this criteria, a nominal EFW initiate setpoint of 6 in. indicated was selected. Credit is only taken for low level EFIC actuation for those transients which do not involve a degraded environment (steam, high radiation, high temperature, etc.). Therefore, only normal environmental errors are used for determining the OTSG level.

The revised setpoint methodology, when applied to the EFIC low level initiate setpoint resulted in a new setpoint of 11 in. Although a substantial number of EFIC low level actuations have occurred prior to installing the new setpoint, no absolute assurance could be given that the system would perform its intended safety function at the original 6 in. level. Based on this determination, FPC immediately instituted appropriate mitigating and corrective actions.

CAUSE

The primary cause was a change in the methodology used by FPC for instrument setpoint determination. 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

The plant immediately entered ITS LCO 3.0.3 and began a power reduction.

ADDITIONAL CORRECTIVE ACTION

The EFIC system bistable setpoints for EFW initiation on low OTSG level were changed to ensure compliance with the requirements of ITS.

ACTION TO PREVENT RECURRENCE

Appropriate procedures will be revised and transmitter and string recalibrations will be performed. This work is scheduled to be completed in the spring of 1996, during Refuel 10.

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PREVIOUS SIMILAR EVENTS

There have been three 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 and OTSG differential high pressure setpoint.

ATTACHMENT

Attachment 1 -Abbreviations, Definitions and Acronyms

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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

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

ESAS Engineered Safeguards Actuation System

FPC Florida Power Corporation

HPI High Pressure Injection

I93-0002 EFIC Level Instrumentation Setpoint Calculation

I&C Instrument & Control

ICS Integrated Control System

IN. Inches

ISA
RP67.04
Part II Instrument Society of America "Setpoints for Nuclear Safety-Related Instrumentation"

ITS Improved Technical Specifications

LCO Limiting Condition for Operation

LER Licensee Event Report

MODE ONE POWER OPERATION (Greater Than 5 Percent Rated Thermal Power)

MODE THREE HOT STANDBY ($K_{eff} < 0.99$ and $T_{ave} > 280$ degrees fahrenheit)

NRC Nuclear Regulatory Commission

OTSG Once Through Steam Generator

EXPIRES 5/31/95

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

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])