

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)										DOCKET NUMBER (2)					PAGE (3)	
CRYSTAL RIVER UNIT 3										0 5 0 0 0 3 0 2					1 OF 0 6	

TITLE (4)
UNPLANNED ACTUATIONS OF EMERGENCY FEEDWATER SYSTEM

EVENT DATE (5)			LER NUMBER (8)			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	0	9	8	5	-	0	1	2	-	0	0	0	9	1	3	8	5	N/A	0	5	0	0	0				
0	8	0	9	8	5	-	0	1	2	-	0	0	0	9	1	3	8	5	N/A	0	5	0	0	0				

OPERATING MODE (9)		3	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)					
POWER LEVEL (10)		01010	20.402(b)		20.406(c)	X	50.73(a)(2)(iv)	73.71(b)
			20.406(a)(1)(i)		50.36(e)(1)		50.73(a)(2)(v)	73.71(a)
			20.406(a)(1)(ii)		50.36(e)(2)		50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 365A)
			20.406(a)(1)(iii)	X	50.73(a)(2)(i)		50.73(a)(2)(vii)(A)	
			20.406(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(vii)(B)	
	20.406(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)			

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER	
W. K. Bandhauer, Nuclear Safety Supervisor	AREA CODE	
	91047	9151-64816

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

DELETE ONE LINE FOR EACH COMPONENT PAYLINE DESCRIBED IN THIS REPORT (1)											
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO				

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

From August 9 through August 16, 1985, Crystal River Unit 3 was performing a plant heatup/startup following a refueling and modification outage. During this period, the low steam generator level feature of the Emergency Feedwater Initiation and Control (EFIC) system actuated 12 times. The EFIC system was installed during the outage. There were two causes of the actuations. Six events were due to a small margin between the normal steam generator level control setpoint and the EFIC low level actuation setpoint. Six of the events were caused by pressure surges resulting from valve manipulations for the level transmitters which are located on a common header. In each case the EFIC actuation parameters were verified to be within normal limits, then the emergency feedwater was returned to standby status.

Technical Specification 3.7.1.2 requires two operable trains with provisions for continued operation for 72 hours with only one emergency feedwater train operable. When returning the emergency feedwater systems to standby status, both emergency feedwater trains are simultaneously placed in manual control which prevents automatic actuation. In each case, Technical Specification 3.0.3 was briefly entered.

The margin between setpoints was increased by raising the normal level control setpoint for the steam generators. A Technical Specification change will be requested to permit bypassing the EFIC channels during maintenance.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

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

EVENT DESCRIPTION

From August 9 through August 16, 1985, Crystal River Unit 3 was performing a plant heatup/startup following a refueling and modification outage.

<u>DATE</u>	<u>TIME</u>	<u>EVENT</u>
08/09/85	1620	Steam generator (AB, SG) low level Emergency Feedwater Initiation and Control, EFIC, (BA) actuation occurred due to insufficient margin between the normal steam generator level control setpoint and the EFIC low level actuation setpoint.
08/10/85	1500	Low level EFIC actuation occurred due to insufficient margin.
	1600	Low level EFIC actuation occurred due to insufficient margin.
08/11/85	AM	Low level EFIC actuation occurred due to insufficient margin.
	AM	Operators observed an apparent discrepancy between the EFIC and normal steam generator level indicators. Operators requested that the normal level transmitters (BA, LIT) be vented.
	1200	Three steam generator low level EFIC actuations occurred due to venting level transmitters.
	1300	Two steam generator low level EFIC actuations occurred due to insufficient margin.
08/12/85	AM	The normal steam generator level control setpoints were raised.
08/14/85	2251	Steam generator low level EFIC actuation occurred due to pressure surge in sensing line while returning a level transmitter to service.
08/16/85	1020	Steam generator low level EFIC actuation occurred due to pressure surge while returning level transmitter to service.
	1223	Steam generator low level EFIC actuation occurred due to pressure surge while returning level transmitter to service.

These 12 EFIC actuations on low steam generators level were attributed to either: (1) low margin between the normal steam generator level control setpoint and the EFIC low level actuation setpoint; or (2) installation of two level transmitters on one common steam generator sensing line.

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APPROVED OMB NO. 3150-0104

EXPIRES 8/31/86

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Low Margin - During the refueling and modification outage, a plant modification was accomplished which installed additional steam generator level sensors and created a new emergency feedwater actuation system termed Emergency Feedwater Initiation and Control, EFIC. These new EFIC sensors are of a different design than the existing startup level transmitters which are used for level control at low feedwater flow rates. EFIC level transmitters tap into the steam generator at different levels (see Figure 1). This results in a divergence of level indications between the startup level and the EFIC low range level as a function of feedwater flow rate. The startup range level sensor is used to control steam generator levels at low power conditions. The margin between EFIC level indication and the actuation setpoint becomes increasingly smaller as feedwater flow rate increases. This condition is shown graphically in Figure 2. Additionally, the EFIC level instrument is compensated by changes in steam generator pressure, which is more rapid than the temperature compensation method employed by the startup range level instrument. Thus the EFIC level instrument will tend to fluctuate more often and with a larger amplitude than the startup range level instrument. These two factors combined to cause an unacceptably low margin to EFIC actuation at low main feedwater flow rates which is amplified by minor fluctuations in feedwater flow rate or steam generator pressure.

Common Sensing Line - Four pairs of EFIC level transmitters were installed on the four existing sets (high and low pressure) of sensing lines for both steam generators as part of this EFIC modification. This design enabled the addition of four electrically independent EFIC level transmitters per steam generator while avoiding the need to tap new lines in the steam generator (see Figure 1). Consequently, when one transmitter is vented, the complimentary transmitter will be subjected to a pressure surge which causes its level indication to change. This results in the actuation of two channels of the low steam generator level feature while venting a single level transmitter. Emergency feedwater flow is initiated by EFIC when two of four channels are actuated.

Initially, plant operators thought that the low level EFIC actuations were spurious as the normal level indications were near the control setpoint. Subsequent investigation attributed the actuations to the causes discussed above. For both situations, all EFIC actuation parameters were verified to be within limits and the emergency feedwater system was returned to standby status.

Technical Specification 3.7.1.2 requires two operable trains with provisions for continued operation for 72 hours with only one emergency feedwater train operable. While returning the emergency feedwater systems to the standby status, both trains are simultaneously placed in manual control which prevents automatic actuation. During this period, the Limiting Condition for Operation of Technical Specification 3.7.1.2 was not met, and Technical Specification 3.0.3 was entered following each actuation. This method of transferring control is brief (several minutes) and is preferred due to the complexity of the EFIC system design.

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EXPIRES 8/31/85

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SAFETY CONSIDERATIONS

The safety function of the EFIC and emergency feedwater systems were fulfilled when these systems responded correctly to each actuation signal.

Entry into Technical Specification 3.0.3 when returning the emergency feedwater and EFIC systems to standby was brief (several minutes) and carefully monitored by plant operators as directed by plant procedures.

CORRECTIVE ACTIONS

A satisfactory margin to EFIC actuation was established by raising the steam generator level control setpoint.

Florida Power Corporation intends to apply for a Technical Specification change that permits short-term bypassing of EFIC channels for maintenance such as transmitter venting.

PREVIOUS SIMILAR EVENTS

The EFIC system was installed during the 1985 refueling and modification outage. This LER reports the first twelve low steam generator level EFIC actuations.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 9/31/85

FACILITY NAME (1)

CRYSTAL RIVER UNIT 3

DOCKET NUMBER (2)

LER NUMBER (5)

PAGE (3)

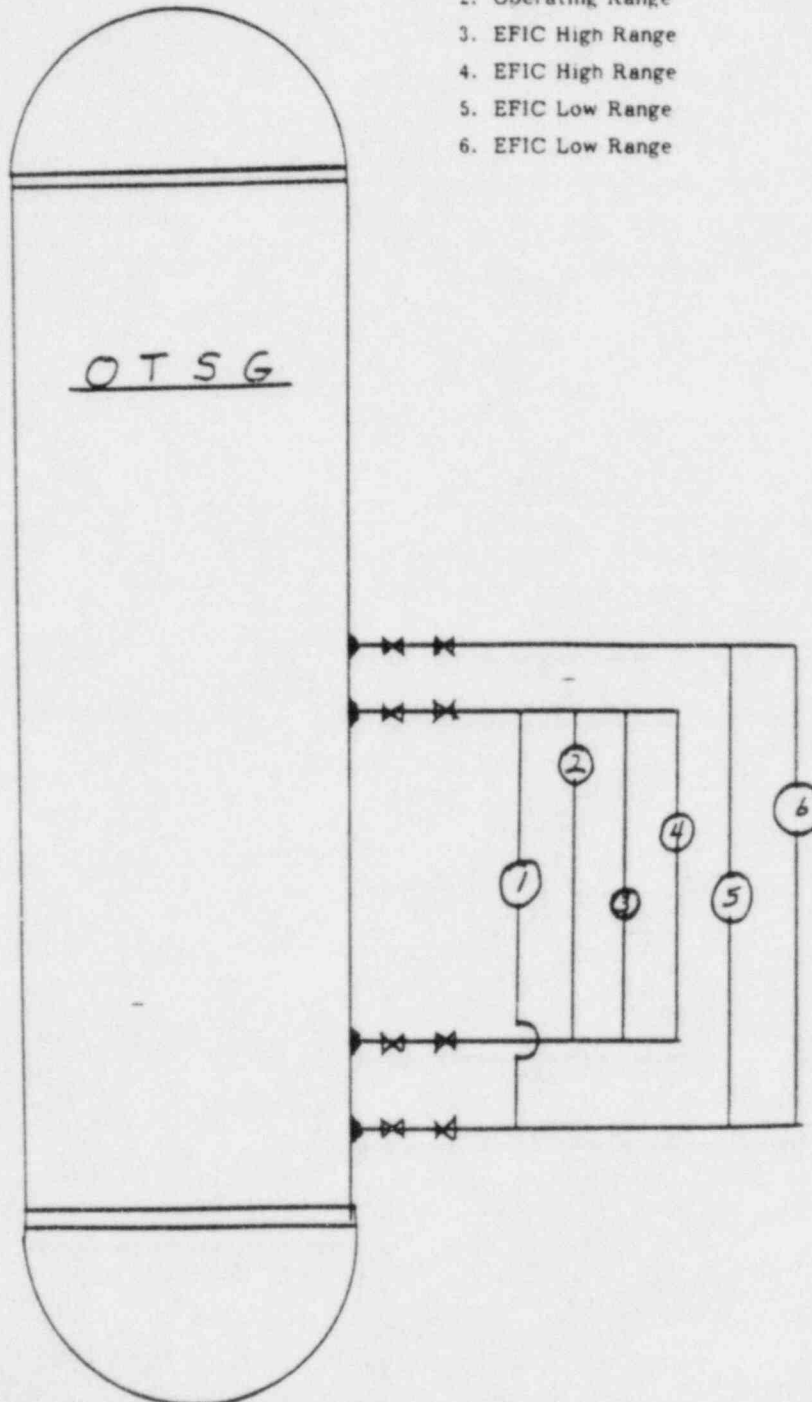
YEAR SEQUENTIAL NUMBER REVISION NUMBER

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TEXT (If more space is required, use additional NRC Form 365A's) (17)

FIGURE 1

1. Startup Range
2. Operating Range
3. EFIC High Range
4. EFIC High Range
5. EFIC Low Range
6. EFIC Low Range

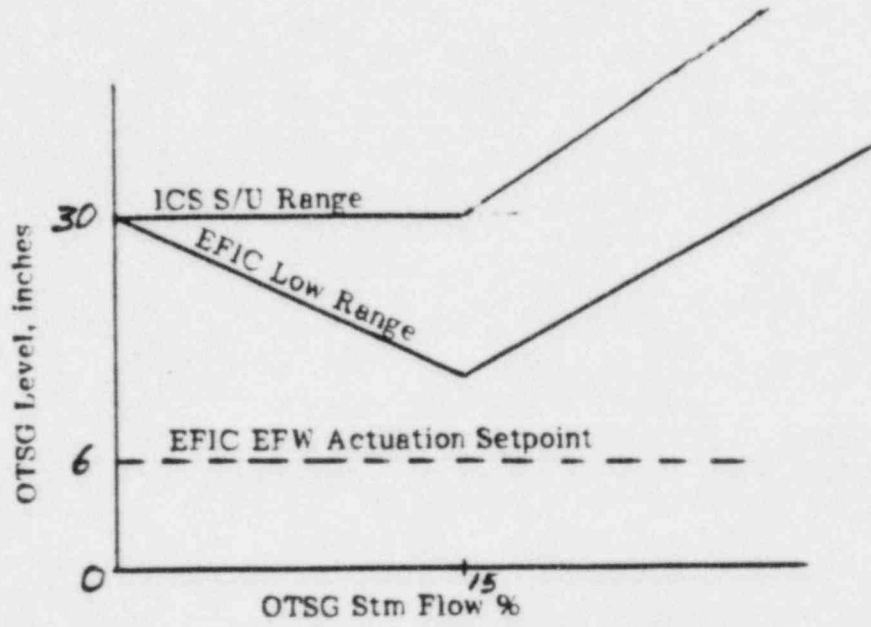


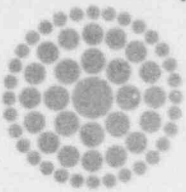
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TEXT (If more space is required, use additional NRC Form 365A's) (17)

FIGURE 2





**Florida
Power**
CORPORATION

September 13, 1985
3F0985-05

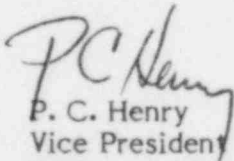
Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72
Licensee Event Report No. 85-012-00

Dear Sir:

Enclosed is Licensee Event Report (LER) No. 85-012-00 which is submitted in accordance with 10 CFR 50.73. This report has been delayed as discussed with your staff in a telephone conversation on September 9, 1985. A similar LER discussed at that time has been combined with this report due to the recurrent nature of the event.

Sincerely,


P. C. Henry
Vice President

Design and Construction

AEF/feb

Enclosure

cc: Dr. J. Nelson Grace
Regional Administrator, Region II
Office of Inspection & Enforcement
U.S. Nuclear Regulatory Commission
101 Marietta Street N.W., Suite 2900
Atlanta, GA 30323

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