

.



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

> S10020240 950929 R ADDCK 05000302

PDR

020071

PDR

1420

CRYSTAL RIVER ENERGY COMPLEX: 15760 W Power Line St • Crystal River, Florida 34428-6708 • (904) 795-6486 A Florida Progress Company

NRC FO	FIM 366				U.S. NUC	LEAR REC	JULATOR	Y COMMISS	ION			APPRO	VED OMB	NO. 3	8150-010	4			
(0-02)										EXPIRES 5/31/95									
		LIC	ENSE	E EVENT R	EPORT (	LER)				EST INFO COM AND REO AND	IMATED B ORMATION MENTS R D REPORTS ULATORY TO THE P FICE OF MA	URDEN I COLLE EGARDI MANA COMMI APERWANAGEM	PER RES CTION RE ING BURD GEMENT I ISSION, W KORK RED MENT AND	PONS EQUE BEN EI BERAN (ASHI UCTIO BUD	ST: 60.0 ST: 60.0 STIMATE ICH (MNE NGTON, ON PRO, GET, WA	OMPLY HOURS TO TH BB 7714 DC 205 JECT (3 ASHING	WITH TH FORWA E RECOR U.S. N 55-0001, 150-0104 TON DC	HIS NAD ADS UCLEAR 4), 20503.	
FACILIT	Y NAME (	1)							R			DOCKE		R (2)	APLANES ADDRESS		PA	GIE (3)	
		CR	YSTAL	RIVER UNIT	3 (CR-3)							0   5	00	0	3	0 2	1 OF	0 7	
TITLE (4	) Rev	vised Ca	alculatio	ns Lead to No	on-Consen	vative E	FIC Set	point Re	sulting in	Ope	ration O	utside	e the De	asigr	n Basi	S			
EVE	NT DATE (	5)		LER NUMBER (	6)	FIEF	PORT DAT	E (7)				OTHER	FACILITIE	S INV	OLVED	(8)			
				SEQUENTIAL	REVISIO	N			FA	CILITY	NAMES			Do	OCKET N	UMBER	(S)		
MONTH	DAY	YEAR	YEAR	NUMBER	NUMBER	MONTH	DAY	YEAR	N//	A				0	5	0 0	0	I	
0 8	3   1	9 5	9 5 -	0 1 6	0 0	0 9	2 9	9 5	N/	A				0	5	0 0	0		
OPE	RATING		THIS REPO	ORT IS SUBMITTE	D PURSUANT	TO THE RE		INTS OF 10	CFR \$: (C)	HECKO	NE OR MOR	e of the	FOLLOWIN	(G)	(11)				
MC	A.A. (9)	'	20.4	05(p)		20.405	(0)		5	0.73(a)	(2)(iv)				73.71	(b)			
POW	<b>KER</b>		20.4	05(a)(1)(l)		50.36(0	0(1)		5	0.73(a)	(2)(v)				73.71	(c)			
(10)	11	0 0	20.4	05(a)(1)(ii)		50.36(c	:)(2)		5	0.73(a)	(2)(vii)			-	THE	ER (Spec	ity in Abet	rect Form	
4			20.4	05(a)(1)(iii)		50. 3(a	a)(2)(i)		5	0.73(a)	(2)(viii)(A)				3654	V			
			20.4	05(a)(1)(iv)	×	50.73(a	a)(2)(ii)		5	).73(a)	(2)(viii)(B)			10					
			20.4	05(a)(1)(v)		50.73(a	(2)(iii)		5	0.73(a)	(2)(x)			1					
NAME						LICENSE	E CONTA	CT FOR TH	S LER (12)					TEL	EPHON	ENUME	IER	an de rener	
				J. A. Frijo	uf, Nuclear	Regula	tory Sp	ecialist				AF		5	6;	3   -	4 7	5   4	
				COMPLE	TE ONE LINE	OR EACH	COMPON	ENT FAILUR	RE IN THIS R	EPOR	T (13)				1				
CAUSE	SYSTEM	COMP	ONENT	MANUFAC- TURER	REPORTABLE TO NPRDS	E		CAUS	SE SYSTEM	A C	OMPONEN	IT	TURE	AC- R	TO NP	RDS			
									1	-	1.1.1	_	11	1					
1.				111					1		1.1.1		1.1	1	1				
			L	SUPPLE	MENTAL REPO	AT EXPEC	TED (14)			-	L		EXPECT	TED	N	IONTH	DAY	YEAF	
							1						SUBMIS	SION		1		1	
ABSTR	S (If you ACT (Limit	e, complete l to 1400 sca	EXPECTES S	UBMISSION DATE) oximately lifteen singl	e-apace typewritte	An lines (16)	NO						DATE (1	5)				1	
	On / in f gene Feed gene Anal At : the by f acco Regu This open The for syst	Augus MODE erati dwate erato lysis, 1500, Emer the I bordan ulato s rep ratio caus setp tem c	t 31, ONE (F ng 872 r Init r leve /Calcu an Op gency mprove ce wit ry Con ort is n outs e of t oint co ontrol	1995, Fl POWER OPE 2 megawat tiation a el contro ulation v perabilit, Feedwate ed Techni th the re mission s submitt side the this even determina setpoin	orida P RATIONS ts. It nd Conti l setpo alues. y Asses: r system cal Spen quirement of this ed in an design I t was a tion. I t. App	ower ( ) ope was ( rol ( int was sment n rem cific nts of even ccord basis chang Correc ropria	Corpo ratin deter EFIC) as no Comm ained ation f 10 t, wh ance of t ge in ctive ate p	ration g at 1 mined syste n-cons ittee OPERA s. At CFR 50 ich wa with 1 he pla the m actio rocedu	's (FF 00% RA by FPC m natu ervati was co BLE an 1551 .72, F s assi 0 CFR nt. ethodo n will res wi	PC) TED peral ve nve d w on PC gne 50.	Cryst THER rsonn circ relat ened a would Augus notif d the 73(a) y use clude be re	al F MAL el t ulat ive nd o func t 31 ied (2)( d by cha vise	liver POWEF that 1 to ne to ne letern tion the f the f (ii)(E v FPC anging	Un R a the ste ew nin as 95, Nuc umb B) pe g t i	it 3 nd Eme am ed t req in lear er 2 for rson he E nstr	was rgen hat uire 9266 nel FIC umer	ed i.		
	str	ing c	alibra	ations wi	11 be p	erfor	med.												

NRC FORM 366A (5-92)	EAR REGULATORY CON	MISS	ION						APPI	ROVE	D OM	B NO	31/1	50-0 95	104						
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 20555-0001, AND TO THE PAPERWORK, REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON DC 20503.										٨R					
FACILITY NAME (1)	anna a sharar a sharar a barar a barar a sharar	DOCKET NUM	BER (	3	and the second					L	ER NI	JMBE	R (6)						PAG	E (3)	
CRY	STAL RIVER UNIT 3 (CR-3)							YE	AR		SEQU	ENTIAL			REVIS	BER					
		0 5 0	0	0	3	0	2	9	5		0	1	6 -	-	0	0	0	2	OF	0	7

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 (193-0002 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

NPIC FORM 366A (5-92)	U.S. NUCL	EAR REGULATORY COMMISSION	APPROVED OMB NO. 3150-0104 EXPIRES 5/31/96												
	LICENSEE EVENT REPORT (L 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. NUCLE/ REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON DC 20503.													
FACILITY NAME (1)		DOCKET NUMBER (2)	LER NUMBER (8)								E (3)				
CRY	STAL RIVER UNIT 3 (CR-3)			YEAR		SEQUENTIAL NUMBER		REVISION							
		0 5 0 0 0 3	0 2	9   5		0 1 6		0 0	0	3 OF	0 7				

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

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

3.

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;
- 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;
  - 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:

- Detection of low level in either OTSG;
- 2. Loss of both main feedwater pumps;
- Detection of the loss of all RCPs;
- Low pressure in either OTSG;
- 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

NRC FORM 366A (5-92)	HC FORM 386A U.S. NUCLEAR REGULATORY COMMISSION 5-92)					ROVED	OMB I	NO. 3 8 5/31	150-010 /95	4				
	LICENSEE EVENT REPORT (L TEXT CONTINUATION	ER)	ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH TH INFORMATION COLLECTION REQUEST: 50.0 HOURS, FORWA COMMENTS REGARDING BURDEN ESTIMATE TO THE RECOR AND REPORTS MANAGEMENT BRANCH (MNBB 7714), U.S. NI REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104 OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON DC 3								THIS NARE ORDS NUC 11, 104), C 205	) S LEAF	*	
FACILITY NAME (1)		DOCKET NUMBER (2)			L	ER NU	MBER (	6)			1	AGE	(3)	
CRY	STAL RIVER UNIT 3 (CR-3)			YEAR		SEQUE	NTIAL		REVIBIO NUMBER	N R				
		0 5 0 0 0 3	0 2	9   5		0	1   6		0 0		4 0	OF .	0	7

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

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

- 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.
- A Short Term Instruction (STI) has been issued to operations personnel to change the EOP setpoint for maintaining natural circulation.

NRC FORM 308A U.S. NUCLEAR RE (5-92)				100	MIS	SION						APP	ROV	ED O	MB N	0. 3 5/31	150-0	0104					
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. NUCLE REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK. REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON DC 20503.									AR									
FACILITY NAME (1)		DOC	KET	NUM	BER	(2)		Recent of American Street				L	ERN	UMB	ER (6	)					PAG	E (3)	
CRYSTAL RIVER UNIT 3 (CR-3)										YE	RAE		SEQ	MBER	AL.		NUM	BER	-				
		0	5	0	0	0	3	0	2	9	5		0	1	6		0	0	0	5	OF	0	7

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

# 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

NRC FORM 366A	U.S. NUCLEAR			APP	ROVED O	MB NO.	3150-0104												
LICE	INSEE EVENT REPORT (LER	VENT REPORT (LER) NUATION					EXPIRES 5/31/95 ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HOURS. FOWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAI REGULATORY COMMISSION, WASHINGTON, DC 20565-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON DC 20503.												
FACILITY NAME (1)		DOCKET NUMBER (2)			L		SER (6)	REVISION		PAG	ie (3)								
CRYSTAL F	IVER UNIT 3 (CR-3)			YEAR		NUMBER		NUMBER	-	e  05	1017								
TEXT (Il more space le required, l	Jee additional NRC Form 366A's (17)	0 5 0 0 0 3	0 2	9 5		0 1	6	-010	101	6 Ur									
	ATTACHMENT 1 - ABBR	REVIATIONS, DEFINI	TIONS	S AND	AC	RONY	MS												
AMSAC	ATWS Mitigation Syst	em Actuation Circ	uitry																
ATWS	Anticipated Transien	t Without Scram																	
CR-3	Crystal River Unit 3																		
EFIC	Emergency Feedwater	Initiation & Cont	rol																
EFW	Emergency Feedwater																		
EOP	Emergency Operating	Procedures																	
ESAS	Engineered Safeguard	s Actuation Syste	m																
FPC	Florida Power Corpor	ation																	
FSAR	Final Safety Analysi	s Report																	
193-0002	EFIC Level Instrumen	tation Setpoint C	alcul	atio	n														
IN.	Inches																		
ISA	Instrument Society o	f America																	
LER	Licensee Event Repor	t																	
MODE ONE	POWER OPERATION (Gre	ater Than 5 Perce	ent Ra	ted	The	rmal	Powe	er)											
NOD-14	Evaluating Operabil (procedure)	ity and Determ	ining	Sa	fet	y F	unct	ion	Sta	tus									
NRC	Nuclear Regulatory C	ommission																	
NSSS	Nuclear Steam Supply	System																	
OAC	Operations Assessmen	t Committee																	
OTSG	Once Through Steam G	enerator																	
RCP	Reactor Coolant Pump																		
RCS	Reactor Coolant Syst	em																	

. .

NEC FO	ABRE MIRC	U.S. NUCLEAR R	U.S. NUCLEAR REGULATORY COMMISSION					N APPROVED OMB NO. 3150-0104												
	LICI TEX	ENSEE EVENT REPORT (LER) T CONTINUATION		EST INF( COM ANE ANE OFF	IMATED ORMATIO IMENTS REPORT IULATOR TO THE ICE OF M	O CON 50.0 HC MATE T (MNBB TON, DC PROJEC F, WASH	OMPLY WITH THIS HOURS. FORWARD E TO THE RECORDS IBB 7714), U.S. NUCLE JC 20555-0001, JECT (3150-0104), ASHINGTON DC 20503.													
FACILI	TY NAME (1)		DOCKET NUMBER (2)			ι	ER NUM	BER (6)					PAG	¥E (3)						
	CRYSTAL	RIVER UNIT 3 (CR-3)			YEAR		SEQUEN	TIAL ER	RE	IMBER										
	OTTOTAL		0 5 0 0 0 3	0 2	9 5		0 1	6-	_ (	0 0	0	7	OF	0	7					
	RPS RTP	Reactor Protection Sys RATED THERMAL POWER	stem																	
	NOTES:	ITS defined terms app	ear capitalized	in LE	R tex	ĸt	{e.g	. MOI	DE	ONE										
		Defined terms/acronyms used (e.g. React	/abbreviations a tor Building (RB)	appea ) ).	r in	par	rentł	nesis	wł	nen	fir	rst								
		EIIS codes appear in s	square brackets	(e.g.	Mal	keu	р Та	nk [(	св,	TK]	}									