

Florida Power

CORPORATION
Crystal River Unit 3
Docket No. 50-302

May 14, 1997
3F0597-06

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

Subject: LICENSEE EVENT REPORT (LER) 96-019-01

Dear Sir:

Please find the enclosed Licensee Event Report (LER) 96-019-01. The LER is being supplemented to correct the date of initial discovery and to update the status of previously specified corrective actions.

This report is submitted pursuant to 10 CFR 50.73.

Sincerely,

R. E. Grazio, Director
Nuclear Regulatory Affairs

REG/twc

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

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EXPIRES 04/30/98

LICENSEE EVENT REPORT (LER)

(See reverse for required number of
digits/character for each block)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 500 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (IT-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.

FACILITY NAME (1)

CRYSTAL RIVER UNIT 3

DOCKET NUMBER (2)

05000302

PAGE (3)

1 OF 6

TITLE (4)

Classification of Transfer Switch Causes Potential for Loss of Power to ES Status Lights

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
06	13	96	96	-- 019 --	01	05	14	97	FACILITY NAME	DOCKET NUMBER
OPERATING MODE (9)		1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
POWER LEVEL (10)		85%	20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)	
			20.2203(a)(1)		20.2203(a)(3)(i)		<input checked="" type="checkbox"/> 50.73(a)(2)(ii)		50.73(a)(2)(x)	
			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)		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

T.W. Catchpole, Sr. Nuclear Licensing Engineer

TELEPHONE NUMBER (Include Area Code)

(352) 563-4601

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

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

SUPPLEMENTAL REPORT EXPECTED (14)

EXPECTED
SUBMISSION
DATE (15)

MONTH

DAY

YEAR

YES

(If yes, complete EXPECTED SUBMISSION DATE)

☒ NO

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

On June 13, 1996 Florida Power Corporation's (FPC) Crystal River Unit 3 (CR-3) was in MODE ONE (POWER OPERATION) at 85% power and generating 740 megawatts. A Problem Report was generated based on a precursor card that had been previously issued on December 4, 1995 in which a design engineer questioned the qualification of a manual transfer switch which provides power to Engineered Safeguards (ES) status lights from two different vital busses. The transfer switch was misclassified as non-safety related and also did not have mechanical interlock devices installed as specified. The Precursor Card required an engineering evaluation to determine if the manual bus transfer breakers were to be considered safety-related; however, no time limit for the evaluation was identified. The engineering evaluation was not completed until June 13, 1996 when the Problem Report was issued to elevate the degree of significance of the issue. The ES Status Lights are required to be safety related to meet Regulatory Guide 1.97 requirements. On June 14, 1996, after an operability evaluation was performed, CR-3 determined the condition to be outside FPC's design basis due to nonconforming equipment that, with multiple failures of non-safety equipment, could result in the loss of both trains of ES Status lights. The operability evaluation recognized the manual transfer switch was "operable but degraded" and a Justification for Continued Operation established compensatory actions to address the concern with the missing interlocks. The cause of this event was personnel error by failure to reclassify the component during Regulatory Guide 1.97 evaluations. The manual transfer switch will be upgraded to safety related. Modifications to accomplish this are currently scheduled for installation by the end of July, 1997.

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 6
		96	-- 019 --	01	

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

EVENT DESCRIPTION

On June 13, 1996 Florida Power Corporation's (FPC) Crystal River Unit 3 (CR-3) was in MODE ONE (POWER OPERATION) at 85% power and generating 740 megawatts. While performing a design verification of a configuration change package for the fuse control program, a design engineer had previously questioned the qualification of a manual transfer switch [EF,JS] which provides power to the Engineered Safeguards (ES) Indicating Light Matrices from two different vital buses [EF], was misclassified as non-safety related. A Precursor Card was initiated on December 4, 1995, requesting an evaluation to determine if the manual bus transfer breakers should be considered safety-related. No time limit was established for the evaluation, and due to inadequate engineering resources allocated to precursor resolution during the Refuel 10 outage, the evaluation was delayed.

The manual transfer switch is identified in the Configuration Management Information System (CMIS) as Mechanical Interlock Control Box ESCP-1. ESCP-1 is classified in CMIS as non-safety related, whereas the power sources for the ES Indicating Light Matrix, fuses [EF,FU], step down transformers [XFMR] (120 Volt and 28 Volt), and the ES Indicating Light fixtures are all classified as safety related. ESCP-1 consists of four molded case circuit breakers [BKR] within a NEMA 1 general purpose, surface mounted enclosure. The train "A" and train "B" breakers are separated by a metal barrier mounted vertically inside the enclosure (see Figure 1). The original purchase order for ESCP-1 specified sliding mechanical interlocks for each pair of horizontally mounted breakers that would prevent connecting both energized vital busses together; however, these interlocks are not installed.

A Problem Report was issued on June 13, 1996 and included a preliminary engineering evaluation of the seismic adequacy of the enclosure and supports as meeting CR-3 seismic criteria based on "Seismic Qualification Utility Group" (SQUG) guidelines. It was also noted that the molded case circuit breakers, ITE Imperial Type EH, were "seismically insensitive items". Based on this information, a lengthy operating experience indicating ESCP-1 reliability, and the fact that an Operating Procedure (OP) provides direction to prevent inadvertently cross-connecting the vital busses, the Shift Supervisor on Duty (SSOD) determined that ESCP-1 was "conditionally operable". The SSOD then initiated a review in accordance with CR-3's Compliance Procedure CP-150 "Evaluation of Operability Concerns" to confirm the initial disposition. The CP-150 process was completed on June 14, 1996 with the conclusion that ESCP-1 was "operable, but degraded". A Justification for Continued Operation (JCO) was provided which noted there were no electrical isolation or physical separation concerns with vital bus circuitry, and the enclosure, supports, and breakers were seismically acceptable. To address the concern with the missing mechanical interlocks, the JCO indicated that ESCP-1 should be treated as a passive device and the switch should not be manipulated.

Upon being presented with the results of the completed CP-150 review at 1938 hours on June 14, 1996, the SSOD determined the problem was a condition outside CR-3's design basis and a one-hour prompt notification was made to the NRC at 2005 hours in accordance with 10 CFR 50.72(b)(1)(ii)(B). Event Number 30631 was assigned.

This report is being made in accordance with 10 CFR 50.73(a)(2)(ii)(B).

EVENT EVALUATION

The Engineered Safeguards (ES) Actuation Systems (FSAS) [JE] monitors variables to detect loss of Reactor Coolant System (RCS) boundary integrity. Upon detection of "out of limit" conditions of these variables, it

LICENSEE EVENT REPORT (LER)

TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
CRYSTAL RIVER UNIT 3	05000302	96	- 019 -	01	3 OF 6

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

initiates operation of the High Pressure Injection [BQ] (HPI), Low Pressure Injection [BP] (LPI), Reactor Building Isolation and Cooling [BK] (RBIC), and Reactor Building Spray [BE] (BS) Systems. Additionally, it starts the ES diesel generators "A" and "B" [EK,DG]. Status indication for the instrument and actuation channels and the ES components is required to be provided on the main control board [MCBD]. The ES status indication and annunciation are displayed for operator information during startup, normal operation, emergency operation, and shutdown. The ES indication requirements are per Regulatory Guide 1.97 "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident". Per the R.G. 1.97 guidelines, the ES indicating light system is Type B, Category 1.

The primary concern is that a non-safety related/non-qualified component is installed in a safety related system. Power to ESCP-1 is fed from 120 volt vital bus distribution panels [EF,UJX] VBDP-3 and VBDP-4. The function of ESCP-1 is to ensure continuity of power from the vital bus distribution panels to their respective ES indicating light matrices and, as required, provide continuity of power to the light matrices from one power distribution panel. ESCP-1 is a passive device that performs no automatic safety function.

ESCP-1 is located behind the ES section of the MCB and consists of four manual bus transfer switches used to select the source of power to the ES status boards. See Figure 1. A failure or multiple failures of the non-safety normally closed (NC) switches could cause a loss of "A" or "B" status indication thus preventing the function from being fulfilled. There is no credible failure of a normally open non-safety switch that would cross connect the vital busses. Note that these switches are for the ES status boards on the MCB only and do not provide an alternate power source for the ES actuation channels. Further, if a loss of ES status lights were to occur, the operator would have available redundant ES status lights were to occur, the operator would have available redundant ES equipment indication via the indicating lights on the MCB for each pump and valve.

The ESCP-1 enclosure, supports and breakers have been evaluated and found to meet seismic requirements. The physical layout of the breakers in the enclosure and the routing of the cables meets electrical separation requirements. It should also be noted that the ITE Imperial Type EH breakers perform no automatic safety function and by physical design are not highly susceptible to short circuiting. Therefore, a failure of one train would not have an impact on the other.

Operating Procedure OP-703 "Plant Distribution System" currently contains provisions to select the normal switch to the "off" position prior to selecting the alternate switch to "on", thereby preventing cross connection of the vital busses. The existence of procedural guidance and operator training makes the likelihood of a loss of both vital bus branch circuits very small. Therefore, the misclassification of ESCP-1 did not present a risk to safety of the general public.

AUSE

The cause of this event was personnel error in that as Reg. Guide 1.97 was being implemented, transfer switch ESCP-1 was not reclassified as safety related. ESCP-1 and associated cables were installed in 1975 during plant construction. The FPC Electrical Design Criteria - Electrical Circuit Physical Separation and Cable Tray Loading classified the indicating light system on the main control board, including the ES indicating light matrix, as non-safety related. Therefore, the ESCP-1 transfer switch was considered to be a non-safety related component.

With the advent of Reg. Guide 1.97, the ES indicating light matrix was upgraded to safety related. During the subsequent response effort, which resulted in numerous modifications, the ES Indicating Light Matrix was

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 6
		96	- 019 -	01	

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

determined to be safety related, Type B, Category 1. The switch should have been evaluated during this effort and corrected accordingly.

IMMEDIATE CORRECTIVE ACTION

The existence of procedural controls to prevent cross connection of the vital busses was immediately confirmed. Subsequently, the normally open switches on ESCP-1 were tagged open by administrative clearance.

ADDITIONAL CORRECTIVE ACTION

As indicated in FPC letter to the NRC, 3F1296-20, dated December 19, 1996, ESCP-1 will be upgraded to safety related. The modification to upgrade ESCP-1 is identified as a FPC Restart Issue, D-21. This modification is currently scheduled for installation by the end of July, 1997.

ACTION TO PREVENT RECURRENCE

This design error was discussed at a Design Engineering Review Board (DERB) meeting on July 18, 1996. A summary of this discussion was distributed to design personnel within NED as a "lesson learned".

As part of the review process for changing the Configuration Management data base for the fuse control program, all safety related fuses in the Main Control Board and fuse ratings were evaluated. This also involved extensive drawing review. The only situation found involving non-conforming material was with ESCP-1. This review would have identified any other situations where non-safety related equipment was installed in safety related systems. Therefore, no additional preventive action is warranted.

PREVIOUS SIMILAR EVENTS

There have been two previous event reports that discuss improper classifications of equipment. LER 89-036 reported that both of the Borated Water Storage Tank (BP,TK) Level Transmitters (BP,LT) which provide signals to the control room were not seismically qualified. The transmitters were purchased and installed because the plant safety listing (precursor to CMIS) incorrectly identified the safety function of the transmitters as pressure retention only. LER 95-020 reported that non-safety related, backup DC-powered lube oil pumps (CB,P) were being relied upon to provide lubricating oil to the High Pressure Injection (BQ,P)(HPI) pumps after a loss of offsite power (LOOP) event.

ATTACHMENT

Attachment 1 - Abbreviations, Definitions and Acronyms

Figure 1 - Manual Transfer Switch ESCP-1 Wiring

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 6
		96	-- 019 --	01	

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

ATTACHMENT 1 - ABBREVIATIONS, DEFINITIONS AND ACRONYMS

CIDP Configuration Item Data Package

CR-3 Crystal River Unit 3

CP-150 "Evaluation of Operability Concerns"

CMIS Configuration Management Information System

DERB The Design Engineering Review Board consists of a Chairman and engineers with demonstrated technical knowledge/experience in their specific discipline. DERB reviews specific modifications, calculations and other design work for technical accuracy and adherence to requirements.

ES Engineered Safeguards

ESCP-1 Mechanical Interlock Control Box

JCO Justification for Continued Operation

MODE ONE POWER OPERATION (Greater than 5 percent Rated Thermal Power)

NED Nuclear Engineering Design

NEMA National Electrical Manufacturers Association

OP-703 "Plant Distribution System"

R.G. 1.97 "Instrumentation for Light Water Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident"

SQUG Seismic Qualification Utility Group. An industry group responsible for collection of seismic experience data for use in determining generic qualification of power plant equipment

SSOD Shift Supervisor on Duty

NOTES: ITS defined terms appear capitalized in LER text {e.g. MODE ONE}

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

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

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	6 OF 6
		96	-- 019 --	01	

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

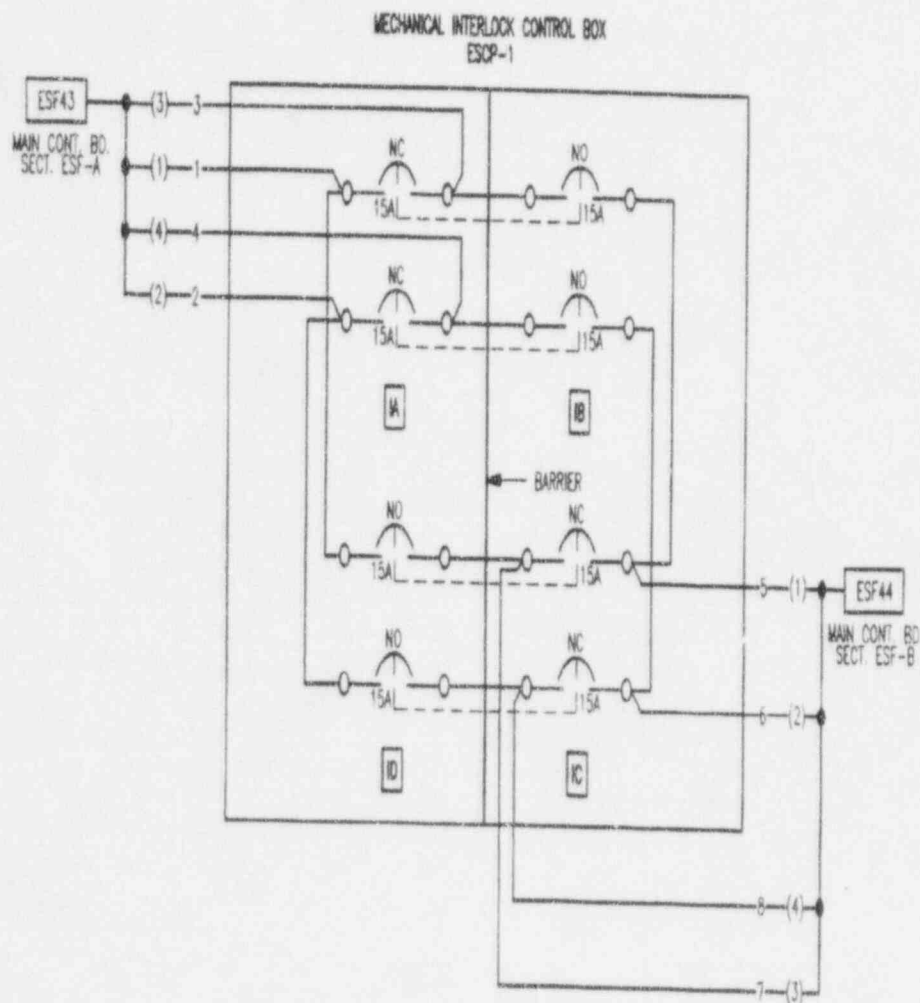


Figure 1