Florida
Power
CORPORATION
Crystal River Unit 3
Docket No. 50-302

October 26, 1995
3F1095-12

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

Subject: Licensee Event Report (LER) 95-019-00

Dear Sir:

Please find the enclosed Licensee Event Report (LER) 95-019-00. This report is submitted by Florida Power Corporation in accordance with 10 CFR 50.73.

Sincerely,

B J Hickle

B. J. Hickle, Director
Nuclear Plant Operations

JAF:ff

Attachment

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

300073

JE22

NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES 5/31/95

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.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
CRYSTAL RIVER UNIT 3 (CR-3)	0 5 0 0 0 3 0 2	1 OF 0 7

TITLE (4)

Service Water System Review Discovers Leak Instrumentation Unable to Perform its Function Resulting in Operation Outside the Design Basis of thte Plant.

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)
									N/A	0 5 0 0 0
0 9	2 9	9 5	9 5	0 1 9	0 0	1 0	2 6	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)	0 9 7	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)	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	TELEPHONE NUMBER
	AREA CODE
J. A. Frijouf, Sr. Regulatory Specialist	9 0 4 5 6 3 - 3 3 5 4

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

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)

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

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

On September 29, 1995, Florida Power Corporation's (FPC) Crystal River Unit 3 (CR-3) was in MODE ONE (POWER OPERATION), operating at 97% RATED THERMAL POWER (RTP) and generating 849 megawatts. FPC engineering personnel determined that instrumentation used to identify leaks in service water cooling to the Reactor Building Cooling Units (RBCU) was incapable of measuring a 90 gallon per minute (gpm) leak, thereby placing CR-3 outside its design basis. The event was reported to the Nuclear Regulatory Commission (NRC) at 1200 on September 29, 1995 as a 1-Hour Non-Emergency Report. Based on the alternate RBCU flow rate measurement and alternate leak detection monitors, this deficiency has no significant impact on the system operability or the safety of the general public. The cause of this deficiency was personnel error, apparently by the FPC and contract Architect & Engineering personnel performing the original system design. Corrective action includes evaluation of the calibration spans for the applicable flow transmitters.

EVENT DESCRIPTION

On September 29, 1995, Florida Power Corporation's (FPC) Crystal River Unit 3 (CR-3) was in MODE ONE (POWER OPERATION), operating at 97% RATED THERMAL POWER (RTP) and generating 849 megawatts. FPC engineering personnel determined that instrumentation used to identify leaks in the Nuclear Services Closed Cycle Cooling Water [KE](SW) system associated with the Reactor Building [NH](RB) Cooling Units [BK,CLR](RBCU) was incapable of measuring a 90 gallon per minute (gpm) leak, thereby placing CR-3 outside its design basis.

On September 27, 1995, FPC Engineering personnel were conducting a proactive, comprehensive review of the SW system. This work was being performed in preparation for a SW system flow balance to be conducted during the upcoming Refuel 10 outage. The evaluation was being conducted as a result of corrective action developed in LER 95-010-00, which committed to the SW system flow balancing. During preparation of a procedure for the SW system flow balancing, a discrepancy was discovered involving the differential Flow Transmitters [CC,FT](FT) associated with the RBCUs. The FTs develop an output signal based on the difference between the RBCU inlet and outlet SW water flow rates. When the differential flow rate exceeds 90 gpm, then a control room alarm sounds, indicating a leak in the SW system lines associated with the RBCUs. The installed instrumentation has a range of 0 to 150 inches (in.) of water which equates to 0 to 1943 gpm. The instrumentation is presently calibrated for a range of 0 to 35 in. of water, corresponding to 0 to approximately 930 gpm. Since SW flow can be in excess 1940 gpm when two of the three RBCUs are in operation, the leak detection instrumentation is offscale high and is not capable of identifying a 90 gpm leak as required by the design basis.

Following the discovery of this discrepancy, an evaluation of its significance was undertaken. Improved Technical Specifications (ITS) does not address these alarms. The Final Safety Analysis Report (FSAR) briefly considers this instrumentation.

On September 29, 1995, at 1115, as a result of the evaluation, which included communications between Engineering, Licensing and Operations personnel, it was determined that this deficiency constituted operation outside the design basis of the plant. The event was reported to the Nuclear Regulatory Commission (NRC) at 1200 on September 29, 1995 as a 1-Hour Non-Emergency Report, via the Emergency Notification System (ENS) per the requirements of 10 CFR 50.72(b)(1)(ii)(B). It was assigned the NRC Event Number 29393. This report is submitted to the NRC in accordance with the requirements of 10 CFR 50.73(a)(2)(ii)(B) for operation outside the design basis of the plant.

APPROVED OMB NO. 3150-0104

EXPIRES 5/31/95

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
CRYSTAL RIVER UNIT 3 (CR-3)	0 5 0 0 0 3 0 2	9 5	0 1 9	0 0	0 3 OF 0 7

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

EVENT EVALUATION

As designed, during normal operations, the RBCUs are served by the Industrial Cooling System [KM](CI). Upon activation of the appropriate Engineered Safeguards [JE](ES) signal, the fan assemblies are automatically isolated from the CI system and switched to the SW system.

Approximately two years ago, it was determined that the CI system was inc'able of adequately handling the normal operating RBCU heat load during the summe' onths. At that time, operation was established to align the RBCUs with SW cooling during both normal and emergency operations.

One of the safety functions of the SW system is to provide a redundant RB cooling function to the RB Spray System [BE], through the RBCUs, for the purpose of removing heat released inside the containment following a gross leakage of primary coolant or main steam. The SW system can provide cooling water to each of three RBCUs. Only two are in operation after an ES actuation. SW flow is isolated to the idle RBCU. The flow through a typical RBCU is illustrated in Figure 1 - RB Cooler Leak Detection. The SW flow to each RBCU is currently in excess of 1940 gpm.

If cooling water supply or return lines rupture, the leaking coil, or pipe, as well as any other component of the SW System inside containment, will initiate an alarm from differential FTs on the cooling water supply and return lines. The operator at the control board will then remotely close the isolation valves on the affected line. The remaining unit will operate in conjunction with the building spray system to provide heat removal capability in accordance with the plant design.

The high flow differential alarm sounds in the control room if there is a 90 gpm or greater difference between the inlet and return SW coolant flow lines. The installed instrumentation has a range of 0 to 150 inches (in.) of water which equates to 0 to 1943 gpm. The instrumentation is presently calibrated for a range of 0 to 35 in. of water, corresponding to 0 to approximately 930 gpm. Since SW flow can be in excess 1940 gpm with two of the three RBCUs in operation, the leak detection instrumentation is offscale high and is not capable of identifying a 90 gpm leak as required by the design basis.

A review of past calibration data sheets by engineering personnel indicates that the calibration range for the FTs was changed from 0 to 150 in. to 0 to 35 in. of water in 1976. Although this range is acceptable for CI system cooling, it is inadequate when the RBCUs are aligned to SW. The basis for this change has not been determined nor has the documentation been located. This deficiency appears to have been in place since the original plant construction, prior to power operation.

Redundant FTs sharing a common return line orifice with the overranged FTs for each of the three RBCUs act as input sources for the Replacement Emergency Dose Assessment System (REDAS) computer. These FTs provide actual RBCU cooling water flow rates. For two RBCU operation, the REDAS indications are 1942.5 gpm. With three RBCU operation, each of the three RBCUs provide REDAS cooling water flow rates of approximately 1800 gpm. Adequate alternate SW system leak detection is available via SW surge tank [CC,TK] and RB Sump level monitoring [IJ,LI].

Based on the alternate RBCU flow rate measurement via REDAS and alternate SW system leak detection via SW surge tank and RB Sump level monitors, this deficiency has no significant impact on the operability of the SW system or the RBCUs. Therefore, this event did not compromise the health and safety of the general public.

CAUSE

The cause of this deficiency was personnel error, apparently by the contract Architect & Engineering personnel performing the original system design. The engineers failed to properly evaluate the system interface requirements.

IMMEDIATE CORRECTIVE ACTION

Upon discovery of this condition a Problem Report was generated, documenting the deficiency.

ADDITIONAL CORRECTIVE ACTION

An evaluation of the calibration spans for the applicable flow transmitters will be performed. The evaluation will include a review of the need for this instrumentation, flow rates in effect for both SW and CI cooling, and an evaluation of the flow switch setpoints. This evaluation will be completed by January 1, 1997, and may produce additional corrective actions.

ACTION TO PREVENT RECURRENCE

The deficiencies identified are associated with the original plant design and construction. Since that time, numerous changes and improvements have been implemented in the communications methods which would preclude the recurrence of this event.

PREVIOUS SIMILAR EVENTS

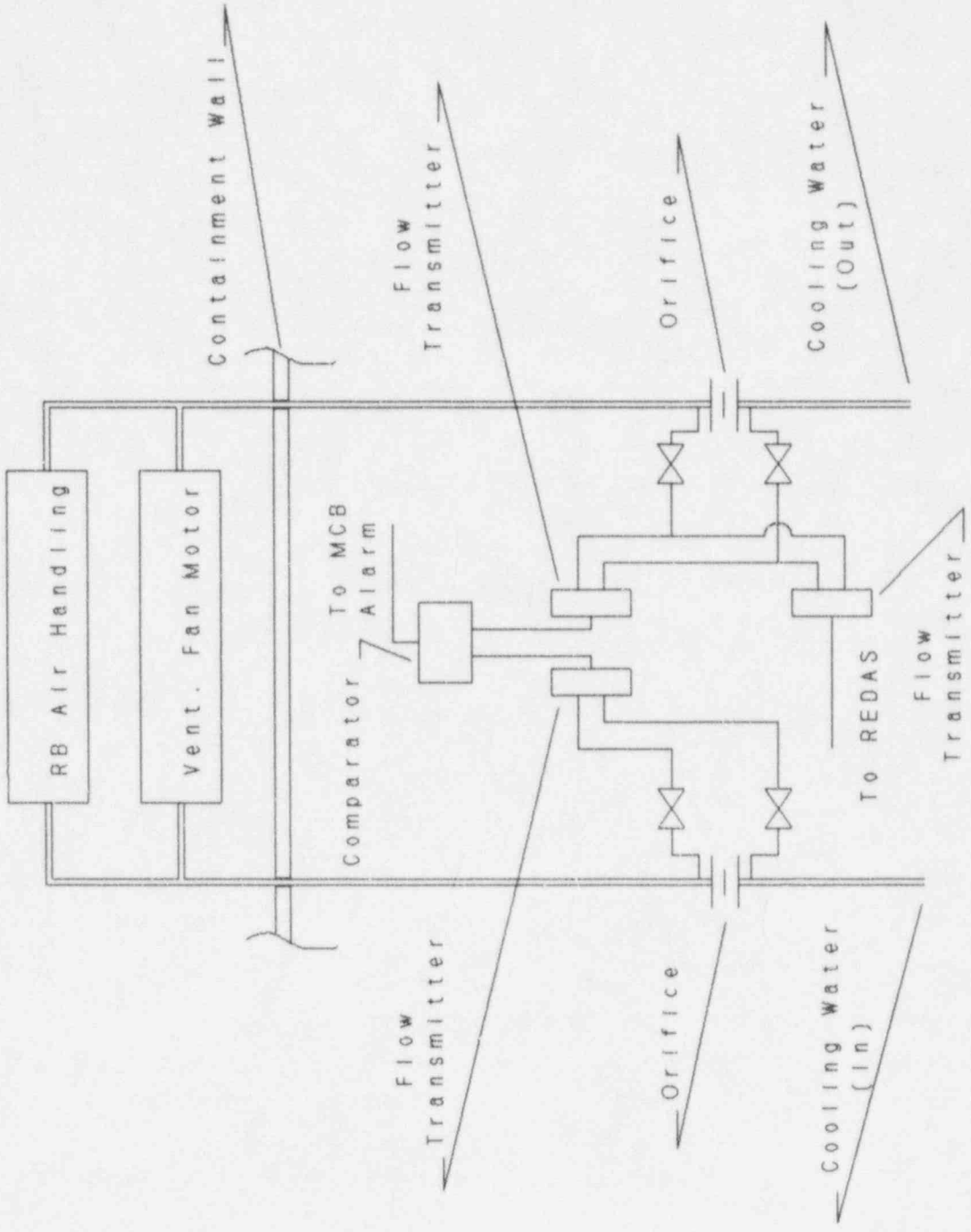
There have been five previous reportable events involving reduced cooling water flow. LER 89-030 reported an incorrect RWP impeller; LER 94-013 addressed heat exchanger fouling; LER 94-014 reported reduced cooling flow with 3 Reactor Building Fan/Coolers in service; LER 95-10 addressed low flow to MUPs when cooling is aligned to the DC system; and LER 95-017-0 reported reduced SW flow to some components following an instrument air based failure at solenoid valves .

ATTACHMENT

Figure 1 - RB Cooler Leak Detection

Attachment 2 - Abbreviations, Definitions and Acronyms

Attachment 1 - RB COOLER LEAK DETECTION



ATTACHMENT 1 - ABBREVIATIONS, DEFINITIONS AND ACRONYMS

CR-3	Crystal River Unit 3
ENS	Emergency Notification System
ES	Engineered Safeguards
FPC	Florida Power Corporation
GPM	Gallons per Minute
ITS	Improved Technical Specifications
MCB	Main Control Board
MODE ONE	POWER OPERATION (Greater Than 5 Percent Rated Thermal Power)
NRC	Nuclear Regulatory Commission
OPERABLE	Capable of Performing its Design Function
RBCU	Reactor Building Ventilation fan/cooler assembly
RTP	RATED THERMAL POWER
REDAS	Replacement Emergency Dose Assessment System
SW	Nuclear Services Closed Cycle Cooling System

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])