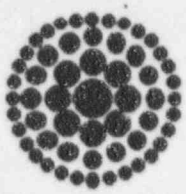


Florida
Power
CORPORATION
Crystal River Unit 3
Docket No. 50-302

December 14, 1995
3F1295-12

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

Subject: Licensee Event Report (LER) 95-010-01

Reference: FPC to NRC letter, 3F0795-06, dated July 20, 1995

Dear Sir:

Please find the enclosed Licensee Event Report (LER) 95-010-01. This supplement is submitted by Florida Power Corporation in accordance with 10 CFR 50.73 to report the status of corrective actions.

Sincerely,

BJ Hickle

B. J. Hickle, Director
Nuclear Plant Operations

JAF:ff

Attachment

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

IE22
1/1

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)

Inadequate Procedure Causes Low Cooling Water Flow to Makeup Pump Resulting in Operation Outside the Design Basis

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)
0 6	2 0	9 5	9 5	--- 0 1 0	--- 0 1	1 2	1 4	9 5	N/A	0 5 0 0 0
									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)	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
J. A. Frijouf, Nuclear Regulatory Specialist	AREA CODE 9 0 4 5 6 3 - 4 7 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 June 20, 1995, Florida Power Corporation's (FPC) Crystal River Unit 3 (CR-3) was in MODE ONE (POWER OPERATION), operating at 100% reactor power and generating 877 megawatts. Plant personnel were completing final preparations for an Emergency Core Cooling System outage. At 0145, the cooling water for makeup pump -1A (MUP-1A) was switched from the normal source to the alternate source. After switchover, the MUP-1A motor cooler water flow alarm actuated. The normal 62 gallons per minute (gpm) cooling water flow was observed to be 32 gpm. Since MUP-1A was not selected as an engineered safeguards high pressure injection pump, MUP-1A was placed under administrative control to the Shift Supervisor On Duty. The determination was made that the 32 gpm flow rate was below the 50 gpm design basis limit, and a formal operability evaluation was conducted. The event was reported to the Nuclear Regulatory Commission as a 1 hour non-emergency report per the requirements of 10 CFR 50.72(b)(1)(ii)(B). This report is submitted in accordance with 10 CFR 50.73(a)(2)(ii)(B) for operation outside the design basis of the plant. The cause of this event was an inadequate procedure. A series of corrective actions were developed including rebalancing system flows, and revising the applicable procedures.

EVENT DESCRIPTION:

On June 20, 1995, Florida Power Corporation's (FPC) Crystal River Unit 3 (CR-3) was in MODE ONE (POWER OPERATION), operating at 100% reactor power and generating 877 megawatts. Plant personnel were completing final preparations for a "B" train Emergency Core Cooling System [BQ](ECCS) outage.

In the normal operating lineup for the CR-3 Makeup and Purification System the cooling water supply to the motor heat exchangers, gear oil coolers and lube oil coolers for Makeup Pumps [CB,P](MUP) -1A and -1B is the Nuclear Services Closed Cycle Cooling System [KE](SW) (see Figure 1). The normal cooling water supply to the motor heat exchanger, gear oil cooler and lube oil cooler for MUP-1C is the "B" train of the Decay Heat Closed Cycle Cooling System [BP](DC). In this configuration, MUP-1B and MUP-1C are selected as High Pressure Injection [BQ](HPI) pumps for Engineered Safeguards (ES) actuations. Since the "B" ECCS outage would render the "B" DC system unavailable, a realignment of the MUPs to their alternate cooling water supplies was conducted.

At approximately 0145 on June 20, 1995, the cooling water for MUP-1A was switched from the normal SW source to the alternate "A" train of DC. Motor heat exchanger cooling water flow was observed to decrease from the normal flow rate of approximately 62 gallons per minute (gpm), to 32 gpm. In view of the flow degradation, which was indicated by the low flow alarms and the fact that MUP-1A was the non-ES selected HPI pump, MUP-1A was placed in standby under the administrative control of the Shift Supervisor On Duty (SSOD) and the "B" ECCS outage was continued. At 0200, the cooling water for MUP-1C was switched from the normal "B" train of DC source to the alternate SW source.

After further discussions, a determination was made that the motor heat exchanger 32 gpm flow rate was below the 50 gpm design basis limit. A formal operability evaluation was conducted in accordance with NOD-14, Evaluating Operability and Determining Safety Function Status, which concluded that MUP-1A was inoperable, but no Improved Technical Specification (ITS) Action Statement applied since MUP-1B and MUP-1C were ES selected and MUP-1A was non-ES selected.

The event was reported to the Nuclear Regulatory Commission at 1111 on June 20, 1995 via the Emergency Notification System as a 1 hour non-emergency report per the requirements of 10 CFR 50.72(b)(1)(ii)(B) and was assigned the Event number 28965. This report is submitted in accordance with 10 CFR 50.73(a)(2)(ii)(B) for operation outside the design basis of the plant.

At approximately 0110 on June 22, 1995, the cooling water supply to the motor heat exchanger, gear oil cooler and lube oil cooler on MUP-1A was realigned from the alternate cooling water ("A" train of DC) to the normal cooling water (SW) and flow was verified to be in the normal range. The cooling water supply to the motor heat exchanger, gear oil cooler and lube oil cooler on MUP-1C was realigned from the

alternate cooling water (SW) to the normal cooling water ("B" train of DC) and flow was likewise verified to be in the normal range.

EVENT EVALUATION

The "A" and "B" trains of the DC system provide cooling water flow to makeup pumps MUP-1A and -1C, respectively. MUP-1A and -1C may also be cooled by the SW system. For operational convenience, MUP-1A is normally aligned to the SW system for cooling, since it is used as the backup for normal makeup operation when MUP-1B is unavailable. This prevents having to run the entire DC "A" train just to provide MUP-1A cooling during normal operation.

Both the DC system and the SW system are designed to be balanced to provide the design cooling water flow rates to MUP-1A. Those flow rates are 50 gpm, 15 gpm, and 10 gpm to the motor heat exchanger, gear oil cooler, and lube oil cooler, respectively. These flow rates ensure adequate cooling will be achieved with the design maximum Ultimate Heat Sink (UHS) temperature (95 degrees Fahrenheit).

Each of the cooled components has an independent cooling water line and associated throttle valve branching off the main cooling water line feeding the pump (see Fig.1). To balance each system independently, the three local throttle valves should be set for the proper flow rate for the lower pressure DC system. Once the DC system flow is set the SW throttle valve in the main cooling water discharge line can be used to set total cooling water flow through the three pump component loops at 75 gpm from the higher pressure SW system. The flow settings established through the throttle valves during the DC flow balance will apportion flow properly to each of the three cooled component loops.

During the last system balance the three local throttle valves were set at the higher SW system pressure instead of the lower DC system pressure. Because of this, the motor heat exchanger cooling water loop flow decreased to approximately 32 gpm when cooling water was swapped to the lower pressure DC system. Nuclear Engineering performed an evaluation of the reduced cooling water flow rates, assuming the other two cooling loops (gear oil and lube oil coolers) were reduced in the same proportion as the motor heat exchanger loop. The evaluation showed adequate cooling water flow would have been provided through all three loops for a UHS temperature up to 92 degrees Fahrenheit. This bounds the UHS temperature for the day which the event occurred and for all historical UHS temperature data at the CR-3 plant. Therefore, no operability concern existed nor was any safety function degraded.

CAUSE

The cause of this event was an inadequate procedure. The normal cooling water supply to MUP-1A is via the SW system. The DC System serves as a backup source of cooling. Both the DC and SW systems were flow balanced using procedure PT-136, titled "DC and SW System Flow Measurements and EGDG-1A KW loading Due to ES Pumps" at the time of the event.

PT-136 has since been split into two separate procedures for balancing the DC and SW sytems. PT-136 contained steps to balance the flow to MUP-1A as supplied by the DC system. The procedure did not contain steps requiring the balancing of SW flow to MUP-1A. Before using the procedure to perform prior system balances, interim procedure changes were made that changed the requirement from balancing the DC supply to MUP-1A, to balancing SW flow to MUP-1A. The justification for these interim procedure changes was that MUP-1A was supplied by the SW system and not the DC system. Based on the interim procedure change, the DC system was not correctly balanced.

IMMEDIATE CORRECTIVE ACTION

1. DC cooling to MUP-1A was placed under administrative control to ensure that MUP-1A is not aligned to DC cooling until flow balancing is completed.

2. Engineering Assistance was provided to evaluate the low DC flow to MUP-1A. A Problem Report was issued documenting the condition.

ADDITIONAL CORRECTIVE ACTION

1. Component upper flow limits have been established for the DC system for use in flow balancing. This was completed on August 17, 1995.

2. Component upper flow limits were also established for the SW system for use in flow balancing. This was completed prior to December 1, 1995.

3. The minimum required design basis cooling flow to MUP-1A has been re-evaluated. This evaluation concluded that MUP-1A would have operated satisfactorily during both routine and accident conditions with cooling water supplied by the DC system at an indicated flow to the motor cooler of 32 gpm. This was completed July 6, 1995.

4. The design basis of the DC system with reduced flow to other components when DC is aligned to MUP-1A has been evaluated. A second evaluation considered the reduction of SW system flow when MUP-1C is aligned to SW. These actions

were completed on September 11, 1995 and no additional concerns were identified.

ACTION TO PREVENT RECURRENCE

1. Procedure PT-136 has been separated into two procedures to clearly differentiate between DC and SW flow balancing. The DC system procedure (PT-136B) has been issued. The SW procedure (PT-136A) will be revised prior to its next use.

2. Flow balancing of the DC system is in progress with the "B" train completed on October 18, 1995. Flow balancing of the "A" train is expected to be complete by the end of 1995. The SW system will be flow balanced during the Refuel 10 cutage currently scheduled for the spring of 1996.

3. SW system interfaces have been evaluated to determine if similar alternate system line-ups exist which need to be considered as part of the system re-balance. This evaluation was completed on August 29, 1995. The evaluation determined that the Secondary Services Closed Cycle Cooling Water System (SC) alignment, although not required for any accident analysis, should be considered in the system re-balance.

   When the Secondary Services Closed Cycle Cooling Water System [KB](SC)is aligned to provide cooling water to the control complex chillers [KM,CHU](CHHE-1A & -1B) flow measurement to assure adequate flow to the chillers should be performed. Installation of a flow measurement orifice, as well as a corresponding revision of Operating Procedure OP-408, "NUCLEAR SERVICES COOLING SYSTEM" will be required. These corrective actions are expected to be completed during the Refuel 10 outage which is currently scheduled for the spring of 1996.

PREVIOUS SIMILAR EVENTS

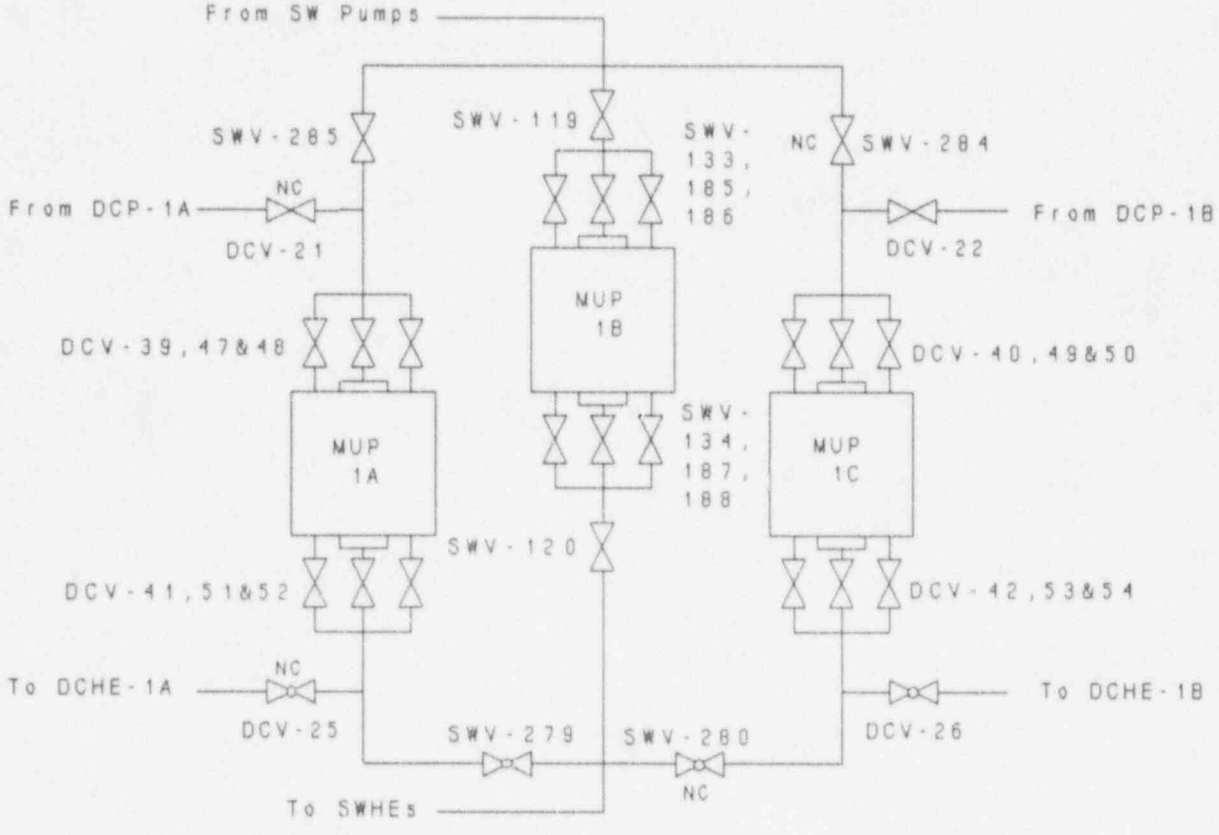
There have been two previous reportable events involving low flow. LER 89-009 reported decay heat pump continuous flow less than minimum required and LER 89-030 addressed the receipt and installation of an incorrect raw water pump impeller resulting in low flow.

ATTACHMENTS

Figure 1 - Makeup Pump Cooling Water Flow

Attachment 1 - Abbreviations and Acronyms

FIGURE 1 - MAKEUP PUMP COOLING WATER FLOW



Note: Flows balanced via DCV-41, -51, & -52
DCV-42, -53, & -54
SWV-134, -187, & -188

PUMP	COOLING SOURCE
MUP-1A	SW - Normal DC "A" - Alternate
MUP-1B	SW - Only
MUP-1C	DC "B" -Normal SW - Alternate

ATTACHMENT 1 - ABBREVIATIONS AND ACRONYMS

Appendix R	Appendix R to 10 CFR 50 - Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979
CR-3	Crystal River Unit 3
DC	Decay Heat Closed Cycle Cooling System
ECCS	Emergency Core Cooling Systems
EGDG	Emergency Diesel Generator
ES	Engineered Safeguards
FPC	Florida Power Corporation
gpm	Gallons per Minute
HPI	High Pressure Injection
ITS	Improved Technical Specifications
KW	Kilowatt
MODE ONE	Power Operation
MUP	Makeup Pump
NOD-14	Evaluating Operability and Determining Safety Function Status (procedure)
OP-408	Nuclear Services Cooling System (procedure)
PT-136	DC and SW System Flow Measurements and EGDG-1A KW Loading Due to ES Pumps (procedure)
Refuel 10	Refueling Outage currently scheduled to begin February 29, 1996
SSOD	Shift Supervisor On Duty
SW	Nuclear Services Closed Cycle Cooling System
UHS	Ultimate Heat Sink