



Florida Power

CORPORATION
Crystal River Unit 3
Docket No. 50-302

October 30, 1995
3F1095-16

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

Subject: Licensee Event Report (LER) 95-020-00

Dear Sir:

Please find the enclosed Licensee Event Report (LER) 95-020-00. This report is submitted by Florida Power Corporation in accordance with 10 CFR 50.73.

Sincerely,

B. J. Hickle, Director
Nuclear Plant Operations

TWC:ff

Attachment

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

020059

LICENSEE EVENT REPORT (LER)

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 (MNB 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.

FACILITY NAME (1) CRYSTAL RIVER UNIT 3 (CR-3)		DOCKET NUMBER (2) 0 5 0 0 0 3 0 2	PAGE (3) 1 OF 8
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TITLE (4)
Improper Downgrade of Backup Lube Oil Pump Creates Reliance on Non-Safety Equipment Resulting in Operation Outside 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	9	2	9	5	0	2	0	0	0	0	1	0	3	0	2	N/A	0	5	0	0	0

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (CHECK ONE OR MORE OF THE FOLLOWING) (11)										
POWER LEVEL (10) 0 9 7	20.402(b)	20.405(c)	50.73(a)(2)(v)	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 T. W. Catchpole, Sr. Nuclear Licensing Engineer	TELEPHONE NUMBER AREA CODE 9 0 4 5 6 3 - 4 6 0 1
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE IN THIS REPORT (13)

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

SUPPLEMENTAL REPORT EXPECTED (14)

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

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 and generating 848 megawatts. Through an ongoing dialogue with a Shift Supervisor, FPC personnel noted that CR-3 had the potential for operating outside its design basis during a Loss of Offsite Power (LOOP) event in that High Pressure Injection (HPI) pumps would be required to rely on non-safety related, backup DC-powered lube oil pumps for lubricating oil. It was discovered that the normal, AC-powered lube oil pumps, would not restart after a LOOP because of a seal-in contact in the start circuit which drops out upon loss of power to the Engineered Safeguards busses. Although no operability concern was identified, a 1-hour, non-emergency event was reported by the Shift Supervisor on Duty in accordance with 10 CFR 50.72(b)(1)(ii)(B). The cause of this event was failure to properly classify the backup lube oil pumps to ensure the HPI pumps reliably perform their intended safety related function. FPC will either install a modification to allow the primary, AC-powered lube oil pumps to auto-start after a LOOP event or pursue efforts to reclassify the backup DC-powered pumps.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
	0 5 0 0 0 3 0 2 9 5 --- 0 2 0 --- 0 0 0 2 OF 0 8					

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

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 848 megawatts. Through an ongoing dialogue with a Shift Supervisor concerning the criteria for alignment of Engineered Safeguards ES Motor Control Center (MCC) 3AB to the same ES bus train as Makeup Pump [CB,P](MUP)-1B, FPC personnel noted that CR-3 had the potential for operating outside its design basis after a Loss of Offsite Power (LOOP) event in 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. It was discovered that the normal, AC-powered lube oil pumps [CB,P](MUP-2A/B/C) would not restart after a LOOP event because of a seal-in contact in the start circuit which drops out upon loss of power to the ES busses. Taking credit for non safety-related equipment for design basis event/accident mitigation is not provided for in the licensing and design basis for CR-3, except as specifically addressed in licensing documents. As a result, a 1-hour, non-emergency event (reference Event No. 29398) was reported by the Shift Supervisor on Duty (SSOD) in accordance with 10 CFR 50.72(b)(1)(ii)(B).

An operability evaluation was conducted on September 29, 1995 by members of the Operations, Engineering, Maintenance, and Licensing staffs which concluded that the HPI System was operable since MUP-3A/B/C and associated components were originally safety related, all subsequent replacements made during plant life were safety related, periodic testing has assured operability, and reasonable assurance exists that all associated components for two of the three pumps appeared to be qualifiable to 10 CFR 50.49 environmental qualification requirements. All three DC-powered lube oil pumps are powered from safety related power supplies; however, one of the pumps (MUP-3B) is powered via a non-safety transfer switch and reasonable assurance of equipment qualification cannot be established at this time. Therefore, the operability evaluation determined that the corresponding HPI pump (MUP-1B) should not be selected on the ES bus pending resolution of this problem. As a result, MUP-1B is being administratively controlled to prevent it from being ES-selected.

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

EVENT EVALUATION

The Makeup and Purification System [CB](MU) functions as the High Pressure Injection System (HPI) part of the Emergency Core Cooling System [BQ](ECCS) for Loss-of-Coolant Accidents (LOCA). The HPI portion of the MU System is designed so that a single active failure will not prevent operation of the system or reduce system capacity below that required to reach and maintain a safe shutdown condition. Per Improved Technical Specification (ITS) 3.5.2, at least two of the

LICENSEE EVENT REPORT (LER)
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	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
	0 5 0 0 0 3 0 2	9 5	0 2 0	0 0	0 3	OF 0 8

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

three makeup pumps shall be OPERABLE during MODES ONE, TWO, and THREE. During normal operation, lube oil is provided to the makeup pumps (MUP-1A/B/C) by safety related, AC-powered main lube oil pumps (MUP-2A/B/C). During an accident, lube oil is provided via either the AC (main) or DC (backup) powered lube oil pumps (MUP-3A/B/C). In the event of a LOOP, the operating HPI and associated AC lube oil pumps will coast down. Once the Emergency Diesel Generators [EK](EDG) start and come up to normal speed and voltage, the HPI pumps will block load; however, the AC-powered lube oil pumps do not auto start following a LOOP. The DC pumps will auto-start on low lube oil pressure and supply the required head energy to circulate the lube oil.

Although originally purchased as an integral part of the skid mounted HPI pumps, the DC-powered lube oil pumps were incorrectly downgraded to non-safety related in 1985 on the basis of their redundancy. Personnel involved in the downgrade failed to take into consideration the function of MUP-3A/B/C in the LOOP accident scenario. As part of this concern, operation of the HPI system (HPI pumps) was questioned because documented evidence of full qualification of the DC-powered lube oil pumps to reliably perform their safety related function has not been maintained.

An operability evaluation was conducted on September 29, 1995 during which it was established that of the three DC-powered Makeup Lube Oil Pumps (MUP-3A/B/C), only the MUP-3B motor has been replaced (in 1984 and 1987) during the life of the plant. Both motors had been purchased from General Electric via a 1976 safety related purchase order. Subsequent to the operability evaluation, it was discovered that the respective pressure switches for MUP-3A/B/C were replaced in 1986. The pressure switches were purchased from Allen Bradley, the original manufacturer, through Consolidated Electric by the catalog method for use in a safety related application, and installed by safety related Modification Approval Record (MAR) 86-01-06-01. The operability evaluation further established that there is reasonable assurance MUP-3A/B/C will perform their design functions if called upon. This is based on frequent verification, via Operating Procedure OP-402 "Makeup and Purification System", of the capability of the DC-powered lube oil pumps to auto start (no less than quarterly) whenever the respective AC-powered lube oil pump is tripped. Also, Surveillance Procedure SP-417 "Refueling Interval Integrated Plant Response to an Engineered Safeguards Actuation" verifies the backup lube oil pumps are running when the undervoltage response systems are tested each refueling outage. Both of these procedures demonstrate the auto-start function of the backup lube oil pumps and the reliable operation of the pressure switches which provide the start signals. In addition, CR-3 has experienced several LOOP events (see LER's 87-021, 87-025, 89-023, 89-025, 93-002 and 93-004) with no evidence of unsatisfactory performance of MUP-3A/B/C.

Based on walkdowns performed by the FPC Environmental Qualification Specialist, a determination was made that the motors for MUP-3A/B/C were of the same manufacturer and similar insulation class as the previously qualified original AC-powered lube

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	

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

oil pump motors (MUP-2A/B/C), the power cable was qualified, and motor lead terminations used in the motors were qualifiable using the material analysis process. The operability evaluation did detect that one of the backup lube oil pumps, MUP-3B, is powered from a safety-related DC power supply via Distribution Panel Transfer Switch [LS] DPXS-1 which is non-safety related and Non-EQ. Since no reasonable assurance existed that this switch was qualifiable without further information, environmental qualification of this switch could not be established. The operability evaluation concluded that MUP-1B would not be ES-selected until the issue could be resolved. It was also noted that pressure switches MU-42-PS2, MU-45-PS2, and MU-48-PS2, and MUP 3A/3B/3C motor starters required to start MUP-3A/B/C, were not included within the FPC Environmental Qualification Program, although these components were qualifiable. Environmental Qualification (EQ) requirements for the Makeup (MU) System components are provided in the "Environmental and Seismic Qualification Program Manual" (ESQPM). The Makeup Pump Rooms in which MUP-3A/B/C and associated components are identified as Zone #1 and are classified as a "Harsh" Environment with a 40 year normal plus 6 months accident dose of 4.5 E + 6 RADS Total Integrated Dose Gamma.

Based on the operability evaluation FPC concluded that the HPI System was operable since MUP-3A/B/C and associated components were originally safety related, all subsequent replacements made during plant life were safety related, and periodic testing has assured operability. Additionally, reasonable assurance exists that all associated components for two of the three pumps appeared to be qualifiable to 10 CFR 50.49 environmental qualification requirements. Therefore, this event did not compromise the health and safety of the general public in that confidence has been established in the individual components needed to support the HPI function.

CAUSE

The cause of this event was personnel error in that individuals responsible for changing the safety classification of MUP-3A/B/C from safety related (SR) to non safety related (NSR) were not aware of the AC/DC oil pump response to a LOOP in combination with LOCA conditions. The original classification change was performed on the MUP-3A,B,C pumps on December 9, 1985 with subsequent changes performed on June 17, 1986 for the motors. A review of the procedures in place during the 1985-1986 time frame revealed that there was minimal guidance available to the design engineer for making a change to the safety listing. It should be noted that the original issue of the Safety Listing, issued September 25, 1979 identified MUP-3A/B/C as "N*" items which is a classification of an item meaning it was originally designed, purchased and installed as safety related, but would not be considered safety related by current regulatory criteria.

LICENSEE EVENT REPORT (LER)
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			YEAR	SEQUENTIAL NUMBER	REVISION NUMBER													
	0	5	0	0	0	3	0	2	9	5	0	2	0	0	0	5	OF	0

TEXT (If more space is required, Use additional NRC Form 306A's (17))

IMMEDIATE CORRECTIVE ACTION

Operations assumed administrative control of MUP-1B to ensure that it will not be ES-selected until this issue is resolved.

ADDITIONAL CORRECTIVE ACTION

Following the operability evaluation conducted on September 29, 1995, FPC management decided to pursue a parallel-path approach to bring the HPI system back to full qualification. Essentially, Item 1 is one path which involves a design change to provide for reliance on MUP-2A/B/C after a LOOP event, and Items 2 and 3 comprise a second approach which addresses the upgrading of MUP-3A/B/C and associated components.

1. A modification will be installed by October 31, 1995 to allow MUP-2A/B/C to assume full responsibility for providing lube oil to MUP-1A/B/C for accident conditions. MUP-2A/B/C should still be normally running whenever the associated MUP-1A/B/C is available. MUP-3A/B/C should be available to provide additional confidence that MUP-1A/B/C will receive lube oil as required.
2. FPC will determine by December 29, 1995, all necessary actions for the upgrading of MUP-3A/B/C and associated components to safety related status.
3. FPC will determine by December 29, 1995, all necessary actions for establishing the environmental qualification of MUP-3A/B/C pump motors and associated equipment to a "Harsh" environment and/or establish calculational data to support a point-specific approach to exempting some or all of the equipment from harsh environment criteria.

ACTION TO PREVENT RECURRENCE

Since 1986, many enhancements have been implemented in the area of configuration management, including several engineering procedure revisions. The procedure which directs changes to the safety listing, cautions the design engineer that changes which are not based on design change documents, have the potential to represent design changes. This assures the impact of the change is adequately considered and justification is provided. Other procedure improvements require the originator of the change to initiate a form to ensure other plant department procedures or documents will be reviewed for possible effect. In addition to these, systems training has been provided to engineers, and emphasis has been placed on a "questioning attitude" and communications between supporting organizations. Based on these actions as implemented, no additional actions to prevent recurrence are necessary.

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	

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PREVIOUS SIMILAR EVENTS

There has been one previous reportable event involving a change in the safety classification of a component which caused operation outside the design basis. LER 89-034 reported the discovery of several non-safety related solenoid valves which shared common circuits with safety related solenoid valves on Main Steam Isolation Valves. When the safety classification of the solenoid valves was changed in 1986, the need to isolate them from the class 1E circuit was not recognized.

There has been one previous reportable event involving failure to adequately consider LOOP conditions. LER 92-005 reported the possibility that an EDG might be overloaded during a simultaneous LOOP/LOCA event if the EDG was operating at the start of the event and two HPI pumps are aligned to the associated bus. The condition exists only if the operating pump is not the pump selected to auto-start on an ES actuation.

ATTACHMENT

Attachment 1 - Abbreviations, Definitions and Acronyms

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

ATTACHMENT 1 - ABBREVIATIONS, DEFINITIONS AND ACRONYMS

- AC Alternating Current
- CR-3 Crystal River Unit 3
- DC Direct Current
- ECCS Emergency Core Cooling System
- EDG Emergency Diesel Generator
- ES Engineered Safeguards
- ESQPM Environmental and Seismic Qualification Program
- EQ Environmental Qualification (10 CFR 50.49)
- FPC Florida Power Corporation
- HPI High Pressure Injection
- ITS Improved Technical Specifications
- LER Licensee Event report
- LOCA Loss of Cooling Accident
- LOOP Loss of Offsite Power
- MAR Modification Approval Record
- MCC Motor Control Center
- MODE ONE POWER OPERATION (Greater than 5 percent RTP)
- MODE TWO Startup (Less than 5 percent RTP)
- MODE THREE Hot Standby (0 Percent Power & Greater than 280 Degrees Fahrenheit)
- MU Makeup System
- MUP Makeup and Purification
- N* Designed, purchased and installed as SR, but NSR by current regulatory criteria as shown in Current Safety Listing - (CMIS)

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

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			YEAR	SEQUENTIAL NUMBER	REVISION NUMBER																
	0	5	0	0	0	3	0	2	9	5	---	0	2	0	---	0	0	0	8	OF	0

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

- NSR Non Safety-Related
- OP-402 Makeup and Purification Procedure
- RCS Reactor Coolant System
- RTP RATED THERMAL POWER
- SP-417 Refueling Interval Integrated Plant Response to Engineered Safeguards Actuation Procedure
- SR Safety-Related
- SSOD Shift Supervisor On Duty

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 (R)).
 EIIS codes appear in square brackets (e.g. Makeup Tank [CB,T])