



Florida Power

CORPORATION
Crystal River Unit 3
Docket No. 50-302

June 27, 1997
3F0697-09

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

Subject: LICENSEE EVFNT REPORT (LER) 97-009-01

Dear Sir:

Please find the enclosed revised Licensee Event Report (LER) 97-009-01. This report is being submitted pursuant to 10 CFR 50.73 (a) (2) (ii) (B). This revision is submitted to provide the extent of condition, root cause, and corrective actions for the Reactor Coolant Pump motor potential leakage sites not collected in the lube oil collection system.

Sincerely,

J. J. Holden,
Director
Nuclear Engineering and Projects

JJH/pmp

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

9707090144 970627
PDR ADOCK 05000302
S PDR



080038

LICENSEE EVENT REPORT (LER)

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 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 (T-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 5

TITLE (4)

Inadequate Design Resulted in Reactor Coolant Pump Lubricating Oil Collection System Being Outside the Requirements of 10CFR50, Appendix R

| 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 | |
| 03 | 19 | 97 | 97 | -- 009 | -- 01 | 06 | 27 | 97 | FACILITY NAME | DOCKET NUMBER | |
| OPERATING MODE (9) | | THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11) | | | | | | | | | |
| N | | 20.2201(b) | | | 20.2203(a)(2)(v) | | | 50.73(a)(2)(i) | | 50.73(a)(2)(viii) | |
| POWER LEVEL (10) | | 20.2203(a)(1) | | | | | | | | | |
| 000 | | 20.2203(a)(2)(i) | | | 20.2203(a)(3)(i) | | | X 50.73(a)(2)(ii) | | 50.73(a)(2)(x) | |
| | | 20.2203(a)(2)(ii) | | | 20.2203(a)(4) | | | 50.73(a)(2)(iii) | | 73.71 | |
| | | 20.2203(a)(2)(iii) | | | 50.36(c)(1) | | | 50.73(a)(2)(iv) | | OTHER | |
| | | 20.2203(a)(2)(iv) | | | 50.36(c)(2) | | | 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

Patrick M. Peterson, Sr. Regulatory Specialist

TELEPHONE NUMBER (Include Area Code)

(352) 795-6486

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)

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

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

On March 19, 1997, Florida Power Corporation's (FPC) Crystal River Unit 3 (CR-3) was in MODE 5, (COLD SHUTDOWN). As a result of a walkdown of the Reactor Coolant Pump [AB, P] (RCP) Motors [AB, MO] performed as part of the system readiness review, FPC identified several leakage sites in the RCP motor lubricating oil system that were outside the boundary of the oil collection system [LM] (LOC) and therefore, not in compliance with the requirements of 10CFR50, Appendix R, Section III.O. This condition is outside the design basis of the plant. The cause of potential leakage sites outside the LOC was an inadequate design of the LOC system due to programmatic deficiencies and lack of attention to detail. RCP motor lubricating oil system piping components located outside the oil collection system are a potential fire hazard associated with uncontained RCP motor lubricating oil. FPC performed a walkdown of five RCP motors (four installed and one in storage) to identify potential lubricating oil system leakage sites on the RCP motors that are outside the lube oil collection system. Potential leakage sites determined to be outside of the LOC system, for the installed RCP motors, will be in compliance with 10CFR50, Appendix R, Section III.O by November 26, 1997. There have been three previous reportable events involving the RCP motor LOC system at CR-3.

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 5 |
| | | 97 | - 009 - | 01 | |

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

Event Description

On March 19, 1997, Florida Power Corporation's (FPC) Crystal River Unit 3 (CR-3) was in MODE 5, (COLD SHUTDOWN). As a result of a walkdown of the Reactor Coolant Pump [AB, P] (RCP) Motors [AB, MO] performed as part of the system readiness review, FPC identified several leakage sites in the RCP motor lubricating oil system that were outside the boundary of the oil collection system [LM] (LOC); and, therefore, not in compliance with the requirements of 10CFR50, Appendix R, Section III.O. This condition is outside the design basis of the plant.

Lubricating oil collection systems were designed and installed in response to 10CFR50, Appendix R, Requirements for Fire Protection. The oil collection system for RCP-1B, RCP-1C, and RCP-1D is an arrangement of sheet metal encapsulating potential leakage sites on each RCP motor. This system was originally installed prior to the issue of 10CFR50, Appendix R, and subsequently modified following Appendix R issuance. The oil collection system installed on RCP-1A is an upgraded design which primarily uses welded drip pans as opposed to sheet metal enclosures. The oil collection system collects and retains RCP motor lubricating oil from potential leakage sites into two 400 gallon tanks [LM, TK] (LOT-4A and LOT-4B).

FPC performed a detailed walkdown and drawing review of motors for RCP-1A, RCP-1B, RCP-1C, RCP-1D, and the spare motor to identify potential leakage sites. During the walkdown and review, a total of 32 potential leakage sites were identified that are outside of the collection system.

On the motors for RCP-1B, RCP-1C, and RCP-1D, the following are the areas that are identified as potential leakage sites outside of the collection system: upper oil reservoir drain line joints and valve joints, speed switches, torque drum to end shield joint, upper reservoir heat exchanger vent piping to torque drum joints, oil supply lines to the anti-rotation device joints, torque drum vent/demister joints, and torque drum lid joints.

Additionally, on RCP-1A, RCP-1B, RCP-1C, and RCP-1D motors, the lower guide bearing thermocouple and the anti-rotation device thermocouple are located outside the lubricating oil collection system. On RCP-1A motor, a union in the lower oil fill to reservoir piping, and on RCP-1B and RCP-1C the threaded cap on low pressure check valves were identified as being located outside the lubricating oil collection system.

The RCP motor lubricating oil system potential leakage sites located outside the boundary of the LOC system were determined to be in non-compliance with the design basis of the plant and are being reported per 10CFR50.73 (a) (2) (ii) (B). An operability evaluation concluded that no system/train safety function was lost as a result of this condition.

Event Evaluation

Potential leakage sites in the RCP motor lubricating oil system located outside the oil collection system are a potential fire hazard associated with uncontained RCP motor lubricating oil leakage.

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 | 3 OF 5 |
| | | 97 | -- 009 -- | 01 | |

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

The Fire Hazards Analysis (FHA) provides an evaluation of the areas potentially affected by the unconfined oil which include: (1) RB-95-300, the area of the Reactor Building from the 95 foot elevation to the 180 foot elevation inside the secondary shield wall which contains the four RCPs, and (2) RB-95-301, the area of the Reactor Building from the 95 foot elevation to the 162 foot elevation outside the secondary shield wall. The FHA evaluation concludes that CR-3 can be safely shutdown even with the loss of components within either of these fire areas. The analyzed fire for the area inside the secondary shield wall was evaluated using the combustible loading from the loss of the entire contents of the RCP motor lube oil collection system. The analyzed fire for the area outside the secondary shield wall assumed a combustible loading associated only with the area cable volumes and did not consider fire loads due to oil.

The consequences of a fire in these areas resulting from oil leakage is not significantly increased. This is due to the spatial separation of components relative to the potential leak path and the small volume of oil which would result from the leak. Based on the relative position of critical components, there is significant spatial separation between the leak path and the safe shutdown equipment located in the two fire areas. In most cases, the distance is in excess of 50 feet. The 10CFR50, Appendix R, Fire Study, Analysis of Safe Shutdown Equipment and Operation, states that "A design basis fire in this area [RB-95-300] will not affect the capability to achieve and maintain cold shutdown."

Cause

The cause of potential leakage sites outside the LOC was an inadequate design of the LOC system due to programmatic deficiencies and lack of attention to detail. Specifically, inadequate interface among organizations existed such that critical assumptions necessary for the design of the RCP oil collection system required to meet Appendix R, Section III.O, were not properly documented and utilized.

Immediate Corrective Actions

FPC performed an engineering evaluation to determine the extent of condition of FPC's compliance to 10CFR50, Appendix R, attributable to potential leakage sites located outside the LOC system. During the walkdown and review a total of 32 potential leakage sites were identified that are outside of the collection system.

An operability evaluation concluded that no system/train safety function would be lost as a result of this condition. Therefore, FPC concluded that there is no OPERABILITY concern in the current MODE 5 (COLD SHUTDOWN).

Corrective Actions

FPC performed a walkdown of five RCP motors (four installed and one in storage) to identify potential lubricating oil system leakage sites on the RCP motors that are outside the lube oil collection system. Potential leakage sites determined to be outside of the LOC system, for the installed motors, will be

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 5 |
| | | 97 | -- 009 -- | 01 | |

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

modified by either eliminating the leakage site using non-mechanical connections or modifying the LOC system to collect leakage from the remaining sites. The LOC system will be in compliance with 10CFR50, Appendix R, Section III.O by November 26, 1997.

Actions to Prevent Recurrence

FPC Nuclear Operations Engineering (NOE) has significantly improved the plant modification process to provide increased engineering oversight of vendor supplied systems. Nuclear Engineering Procedure (NEP) 100 Series, Organizational Requirements, and 200 Series, Design Developments, have been improved. NEP 210, Modification Approval Records, specifies Design Input Requirements in sufficient detail "... to assure the design is carried out in a correct manner and to provide a basis for making design decisions, accomplishing verification or checking, and for evaluating design changes." In addition, NOE uses an engineering project review group to obtain input from all site organizations and selected outside groups. This activity is governed under the "Design Engineering Review Board (DERB) Expectations, Policies and Practices" guidelines. The RCP oil collection system Restart Issue D-11-B Team has incorporated these design controls to maintain compliance with 10CFR50 Appendix R Section III.O for RCP-1A, 1B, 1C, and 1D.

Previous Similar Events

There have been three previous reportable events involving the RCP motor LOC system at CR-3. LER 88-009-00 and LER 92-022-00 both addressed the issue of insufficient reserve volume in the RCP motor LOC system tanks. LER 95-008-01 addressed the issue of RCP motors lubricating oil leakage not being collected by the LOC system.

Attachments

Attachment -1 Abbreviations, Definitions, and Acronyms

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 | 97 | - 009 - | 01 | 5 OF 5 |

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

ATTACHMENT 1 - ABBREVIATIONS, DEFINITIONS, AND ACRONYMS

| | |
|-------|---|
| LER | Licensee Event Report |
| FPC | Florida Power Corporation |
| CR-3 | Crystal River Unit 3 |
| LOC | Lube Oil Collection System |
| RCP | Reactor Coolant Pump |
| 10CFR | Title 10 of the Code of Federal Regulations |
| FHA | Fire Hazards Analysis |
| NOE | Nuclear Operations Engineering |
| NEP | Nuclear Engineering Procedure |
| DERB | Design Engineering Review Board |

Note: Improved Technical Specifications terms appear in capitalization in the text of the LER. EIS Codes appear in square brackets.