NRC Form 366 (9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO 3150-0104
EXPIRES 8/31/88

# LICENSEE EVENT REPORT (LER)

| FACILITY NAME (1) | DOCKET NUMBER (2) | PAGE (3) |
|---|---|---|
| CRYSTAL RIVER UNIT 3 | 0 5 0 0 0 3 0 2 | 1 OF 0 4 |

TITLE (4) Violation of Appendix R III.O Due to Insufficient Reserve Volume in RC Pump Lube Oil Collection System Caused by Lack of Awareness Behind 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) |
| | | | | | | | | | | N/A | 0 5 0 0 0 |
| 0 3 | 0 3 | 8 8 | 8 8 | — | 0 0 9 | — 0 0 | 0 4 | 1 4 | 8 8 | 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(a) | 50.73(a)(2)(iii) | 73.71(b) |
| | | 20.405(a)(1)(i) | 50.36(c)(1) | 50.73(a)(2)(iv) | 73.71(c) |
| | | 20.405(a)(1)(ii) | 50.36(c)(2) | 50.73(a)(2)(v) | 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)(vii)(A) | |
| | | 20.405(a)(1)(iv) | X 50.73(a)(2)(ii) | 50.73(a)(2)(vii)(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 |
|---|---|
| L. W. MOFFATT, NUCLEAR SAFETY SUPERVISOR | AREA CODE 9 0 4 7 9 5 - 6 4 3 6 |

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) | X NO | | | | |

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


On January 10, 1988, Crystal River Unit 3 was in MODE 1 (power operation) and escalating in power following a refueling outage. The level in the Lube Oil Collection tank for the Reactor Coolant Pumps was slowly trending up with no apparent loss of oil. This was indicative of a small cooling water leak (less than 0.01 gallons per minute). The level trended up until, on January 13, 1988, it reached the procedural limit of 20 percent. The level was then periodically pumped down to maintain compliance with Appendix R III.O. On March 3, 1988, a refined calculation better defining the indicated level limit was published. The new limit was 15.5 percent. During the period between January 10 and March 2, 1988, the plant was periodically operating outside the design basis as committed for compliance to 10CFR50 Appendix R. The cause of the violation was a procedural deficiency. It was later discovered additional violations occurred prior to December 1987, caused by lack of awareness by plant personnel of the design basis behind the Lube Oil Collection tank reserve volume. The proper level is being maintained by draining the tank prior to reaching the volume limit.




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## DESCRIPTION OF EVENT

In the second quarter of 1983, Crystal River Unit 3 was in a refueling outage and a Lube Oil Collection system [LM] was installed to collect the combined oil leakage of all four Reactor Coolant (RC) Pumps [AB,P]. This system is located totally within the secondary shield wall [NH] making it inaccessible during power operations. Crystal River Unit 3 has four RC pumps with each motor having 2 reservoirs [LL,RVR]; one upper of approximately 175 gallons, and one lower of approximately 15 gallons. The Lube Oil Collection system was installed to comply with 10CFR50 Appendix R III.O, which requires the ability to contain the entire oil volume of all four RC Pumps. The configuration of the system is such it will also collect condensation and cooling water [CC] leakage from in and around the RC pump motors [AB,P,MO]. During a refueling outage in December 1987, while in MODE 5 (cold shutdown), a drain line and a level transmitter [LT] were added. The drain line now penetrates the secondary shield wall in the basement of the Reactor Building [NH] enabling on-line draining and the level transmitter has remote indication [LI] outside the Reactor Building. During the period between the second quarter 1983 and December 1987, total level indication did not exist. Correspondence from the Site Engineering Department provided guidance on what level would require action to ensure available volume to meet Appendix R requirements. Twenty percent was given as a preliminary indicated level necessary to remove liquid to free up volume in the tank [IM,TK] for compliance to Appendix R.

On start up from the refueling outage in December 1987, Surveillance Procedure, SP-300, Operating Daily Surveillance Logs, was used to record and trend the level. The level was rising with no apparent oil loss from the RC pumps indicating a small cooling water leak (less than 0.01 gallons per minute). This was later confirmed by laboratory analysis. The leakage rate varied with changes in cooling water system parameters. On January 13, 1988, the plant was in MODE 1 (power operation) and the level in the Lube Oil Collection tank exceeded 20 percent. Action was initiated to pump the system down. Equipment problems delayed this pump-down until January 19, 1988. In order to pump the system down, Reactor Building entries are required using self-contained breathing equipment and a portable positive displacement pump. After this initial entry, weekly entries were made to keep the level below 20 percent.

On March 3, 1988, a refined calculation, better defining the indicated level limit was published. A total tank volume of 802.2 gallons and a RC pump oil volume of 760 gallons left 42.2 gallons in reserve for condensation and leakage. The new limit of 42.2 gallons corresponded to approximately 11 percent indicated level (accounting for worst case instrument errors ). This indicated level limit was later raised to 15.5 percent following actual data collection and correlation. The actual level initially exceeded this new limit on approximately January 10, 1988. During the period between January 10, 1988, and March 2, 1988, the plant was periodically operating outside the design basis as committed for compliance to 10CFR50 Appendix R.

A historical investigation revealed that 187 gallons of water and oil were drained on November 11, 1986 during a MODE 5 (cold shutdown) outage. This mixture was collected over a 141 day period. Level indication did not exist so it was not known how much fluid was in the tank prior to draining it. During the period prior to this event, operation continued outside the design basis as committed for Appendix R. Personnel involved did not know the design basis behind the reserve volume in the tank, therefore, it was not realized as reportable. This event did, however, initiate the recent modification to add a drain for on-line use and to add remote level indication.

CAUSE

The cause of violating Appendix R was a deficiency in the surveillance procedure caused by using a preliminary calculation as the level limit for compliance. The 20 percent limit was not conservative prompting action to pump down the level after the actual limit was violated. The erroneous calculated level limit of 20 percent was caused by taking credit for a portion of piping in the system that, during the verification stage of the refined calculations, was found to be incorrect. The November 1986, violation was caused by lack of an instrument to indicate level. When the large volume of fluid was pumped out, it was not realized Appendix R had been violated.

ANALYSIS

Reactor Coolant Pump oil leakage has historically been minimal. Traces of oil leakage have caused some low levels prompting remote addition of small amounts (quarts) of oil to the pump reservoirs. Condensation and cooling water leakage have contributed the majority of the fluid in the tanks. The lower reservoirs do not have any external oil lines except a drain and fill line. Therefore, rupturing the lower reservoirs would be virtually impossible without complete failure of the motor support structure. The motor support structure is seismically qualified. Appendix R requires reserve capacity for all the oil contained in the RC Pump motor reservoirs. It does not give the flexibility to take credit for oil reservoirs where the probability of rupture is infinitely small. The design of the General Electric motors is such that a simultaneous rupture on all eight reservoirs is not credible. It is therefore assessed that not having the total reserve volume required by Appendix R for the short duration described did not put the plant in an unsafe condition and did not endanger the health and welfare of the public.

CORRECTIVE ACTION

The level in the lube oil tank is being kept less than 42.2 gallons by pumping the water out prior to reaching the 15.5 percent limit. The surveillance procedure will be revised to contain the actual level limit. For the interim, a schedule of draining the tanks was established with the water quantity and indicated level tracked to ensure future compliance with Appendix R. Additional alternatives are being considered by the licensing and engineering departments on methods to maintain compliance with Appendix R on a long term.

basis. Multiple Reactor Building entries at power pose an industrial safety threat to personnel. The information in this report will be incorporated into the training programs for Senior Reactor Operators and Shift Operations Technical Advisors.

HISTORICAL EVENTS

No other incidents where the Lube Oil Collection system was operated outside the design basis have occurred.

Florida Power
CORPORATION

April 14, 1988
3F0488-09

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

Subject: Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72
Licensee Event Report No. 88-009-00

Dear Sir:

Enclosed is Licensee Event Report (LER) 88-009-00 which is submitted in accordance with 10 CFR 50.73.

This report involved the discovery of previous operation of the plant outside the design basis of 10 CFR 50, Appendix R III.0. Previous experience with reporting a discovery of this type event and a re-evaluation of the wording and apparent intent of 10 CFR 50.72 and 10 CFR 50.73 has led FPC to conclude events of this type are not reportable under 10 CFR 50.72 when discovered significantly after their occurrence and potential impact to the plant. This logic does not support the delaying of a known reportable event in order to avoid the 10 CFR 50.72 requirements. Please notify us if this differs from the Region's position.

Sincerely,

Ken Wilson

K. R. Wilson
Manager, Nuclear Licensing

WLR:mag

Enclosure

xc: Dr. J. Nelson Grace
Regional Administrator, Region II

Mr. T. F. Stetka
Senior Resident Inspector

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