NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

# LICENSEE EVENT REPORT (LER)

| FACILITY NAME (1) | DOCKET NUMBER (2) | PAGE (3) |
|---|---|---|
| Fort Calhoun Station, Unit No. 1 | 0 5 0 0 0 2 8 5 | 1 OF 0 2 |

TITLE (4)
Low Boron Concentration in Safety Injection and Refueling Water Tank

| 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 7 | 1 7 | 8 4 | 8 4 | 0 1 2 | 0 0 | 0 8 | 1 6 | 8 4 | N | 0 5 0 0 0 |
| | | | | | | | | | | 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 4 5 | 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) | X 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) | 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. J. Fluehr, Reactor Engineer<br>Fort Calhoun Station, Unit No. 1 | AREA CODE 4 0 2 4 2 6 - 4 0 1 1 |

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)

Technical Specification 2.3(1)a requires that the safety injection and refueling water tank (SIRWT) contain water with a boron concentration of at least 1700 ppm. A routine sample was drawn at 1345 on July 17, 1984; the analysis of the sample yielded a boron concentration of 1656 ppm. The control room was notified at 1410 and boration of the SIRWT was initiated. A second sample was drawn at 1810 following the addition of 1400 gallons of 7.08% boric acid. The analysis of this sample yielded a boron concentration of 1846 ppm. The SIRWT boron concentration will be maintained at a level somewhat higher than 1700 ppm to prevent the measured boron concentration from falling below 1700 ppm due to normal sample variation.

| FACILITY NAME (1) | DOCKET NUMBER (2) | LER NUMBER (6) | | | PAGE (3) |
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| Fort Calhoun Station, Unit No. 1 | 0 5 0 0 0 2 8 5 | 8 4 | — 0 1 2 | — 0 0 | 0 2 OF 0 2 |

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

At 1345 on July 17, 1984, it was determined during routine sample analysis that the boron concentration in the safety injection and refueling water tank (SIRWT) was 1656 ppm. This was contrary to Technical Specification 2.3(1)a which requires a boron concentration of at least 1700 ppm. The reactor was operating at approximately 45% power.

The control room was notified of the results of the boron analysis at 1410. Boration of the SIRWT was begun shortly thereafter. Fourteen hundred gallons of 7.08% boric acid were added to the SIRWT, increasing the boron concentration to 1846 ppm according to a sample drawn at 1810. Technical Specification 2.0.1(1) requires the plant to be placed in hot shutdown within six hours unless the boron concentration requirement is satisfied.

The most recent boron analysis prior to the one which yielded 1656 ppm had shown a SIRWT boron concentration of 1711 ppm. No water had been added to the SIRWT since that time. The reduction in indicated boron concentration from 1711 ppm to 1656 ppm may have been due to normal analytical error or lack of homogeneity in the SIRWT boron concentration.

The accident for which SIRWT boron concentration plays the most important role is the main steam line break (MSLB) accident. The MSLB analysis for Cycle 9 (the present cycle) is enveloped by the analysis for Cycle 8. The positive reactivity insertion, due to cooldown to 210°F, is calculated to be 5.1%$\Delta\rho$ for Cycle 8 versus 2.8%$\Delta\rho$ for Cycle 9. The negative reactivity insertion with a SIRWT boron concentration of 1656 ppm would be (1700-1656 ppm) / (94 ppm/%$\Delta\rho$) = .5%$\Delta\rho$ less than that assumed in the safety analysis.

However, the net effect is that a MSLB during Cycle 9, with a SIRWT boron concentration of 1656 ppm, would result in a positive reactivity addition of 5.1 - 2.8 - .5 = 1.8%$\Delta\rho$ less than that utilized in the Cycle 8 safety analysis.

In addition, it is emphasized that this event occurred early in core life at which time the consequences of a MSLB would be much less severe than late in core life.

**Omaha Public Power District**
1623 Harney Omaha, Nebraska 68102
402/536-4000

August 16, 1984

LIC-84-268
FC-401-84

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

Reference: Docket No. 50-285

Gentlemen:

Licensee Event Report
Fort Calhoun Station

Please find enclosed Licensee Event Report 84-012 dated August 16, 1984. This report is being submitted per requirements of 10 CFR 50.73.

Sincerely,

R. L. Andrews
Division Manager
Nuclear Production

RLA/JJF/lp

Enclosure

cc: Mr. Richard P. Denise, Director
Division of Resident, Reactor Project
& Engineering Programs
U. S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

INPO Records Center
Mr. E. G. Tourigny, Project Manager

SARC Chairman
PRC Chairman
Mr. L. A. Yandell, Senior Resident
Inspector
Fort Calhoun File (2)

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