

Omaha Public Power District  
444 South 16th Street Mall  
Omaha, Nebraska 68102-2247  
402/636-2000

July 22, 1991  
LIC-91-0090L

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Mail Station P1-137  
Washington, DC 20555

Reference: Docket No. 50-285

Gentlemen:

Subject: Licensee Event Report 91-11 for the Fort Calhoun Station

Please find attached Licensee Event Report 91-11 dated July 22, 1991. This report is being submitted pursuant to 10 CFR 50.73(a)(2)(v) and (c). A two-week extension for submitting this report was granted by Mr. R. P. Mullikin, NRC Senior Resident Inspector, on July 8, 1991.

If you should have any questions, please contact me.

Sincerely,

*W. G. Gates*

W. G. Gates  
Division Manager  
Nuclear Operations

WGG/rkj

Attachment

c: R. D. Martin, NRC Regional Administrator  
W. C. Walker, NRC Project Manager  
R. P. Mullikin, NRC Senior Resident Inspector  
INPO Records Center

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## LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503

FACILITY NAME (1)

Fort Calhoun Station Unit No. 1

DOCKET NUMBER (2)

0 5 0 0 0 2 8 5 1 OF 0 4

PAGE (3)

TITLE (4)

Pressurizer Pressure Low Signal (PPLS) Setpoints

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 (15) |
|-------|-----|------|------|-------------------|-----------------|-------|-----|------|----------------|--------------------|
| 0     | 6   | 0    | 6    | 9                 | 1               | 9     | 1   | 1    | N              | 0 5 0 0 0          |
| 0     | 6   | 0    | 6    | 9                 | 1               | 0     | 1   | 1    |                | 0 5 0 0 0          |

OPERATING MODE (9)

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5 (Check one or more of the following) (11)

|                   |                  |                     |  |
|-------------------|------------------|---------------------|--|
| 20.402(b)         | 20.406(a)        | 50.73(a)(2)(iv)     | 73.71(b)   |
| 20.406(a)(1)(i)   | 50.38(a)(1)      | X 50.73(a)(2)(v)    | 73.71(a)   |
| 20.406(a)(1)(ii)  | 50.38(a)(2)      | 50.73(a)(2)(vi)     | OTHER (Specify in Abstract below and in Text, NRC Form 366A) |
| 20.406(a)(1)(iii) | 50.73(a)(2)(i)   | 50.73(a)(2)(vii)(A) |  |
| 20.406(a)(1)(iv)  | 50.73(a)(2)(ii)  | 50.73(a)(2)(vii)(B) |  |
| 20.406(a)(1)(v)   | 50.73(a)(2)(iii) | 50.73(a)(2)(ix)     |  |

LICENSEE CONTACT FOR THIS LER (12)

NAME

David J. Buell, Shift Technical Advisor

TELEPHONE NUMBER

AREA CODE

4 0 2 5 3 3 1 6 8 9 5

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NRC | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NRC |
|-------|--------|-----------|--------------|-------------------|-------|--------|-----------|--------------|-------------------|
|       |        |           |              |                   |       |        |           |              |                   |
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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 6, 1991, at 1728 hours, plant management determined that the potential existed for the pressurizer pressure instrument loops to be calibrated in a manner which could have resulted in the inability to trip Pressurizer Pressure Low Signal (PPLS) within the design analysis limit. Although all four PPLS channels were set within the analysis limits, up to four instrument channels of the PPLS could have been inoperable due to calibration procedure deficiencies.

The root cause of this event resulted from the lack of an established program to assure that the calibration procedures were written to meet the assumptions/inputs used in the setpoint calculations. Corrective actions include the following: performing an evaluation (Calculation FC05565) to ensure that the existing PPLS trip setpoints (as calibrated) meet the Technical Specification requirements; revising the PPLS loop calibration procedures to eliminate the potential for error prior to their next expected use (January, 1992); and, establishing a program to evaluate and assure that design basis assumptions/inputs are met with current plant configuration and procedures.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (PB30), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

DOCKET NUMBER (2)

LER NUMBER (6)

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Fort Calhoun Station Unit No. 1

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

The nuclear steam supply system at Fort Calhoun Station Unit No. 1 is a two-loop pressurized water reactor. The pressurizer has four channels (A through D) of pressure instrumentation which provide input to Engineered Safety Feature Systems (ESF) and the Reactor Protective System (RPS), as well as providing indication in the Control Room.

The ESF consists of two logic subsystems (A and B), each composed of four channels (A through D) arranged to provide independent safety feature initiation on a 2 out of 4 logic basis. Pressurizer Pressure Low Signal (PPLS) and Containment Pressure High Signal (CPHS) are the two automatic initiating systems to the ESF Safety Injection Actuation Signal (SIAS). SIAS automatically actuates safety injection in the event of severe Reactor Coolant System (RCS) depressurization/cooldown events, of which the most limiting are the Loss of Coolant Accident (LOCA) and Main Steam Line Break (MSLB). PPLS initiates an SIAS if 2 of 4 channels on a subsystem decrease to 1600 psia. This is done to conserve the RCS coolant inventory in the event of a LOCA and provides added shutdown capability during a MSLB. The four pressurizer pressure channels that provide independent signals for PPLS are designated as A/P-102, B/P-102, C/P-102, and D/P-102.

During engineering review of upgraded instrument and control calibration procedures, a concern was identified pertaining to instrument setpoint selection and overall instrument loop uncertainties. Specifically, the concern was raised while reviewing the calibration procedures for the PPLS initiating instrument loops (A/P through D/P-102).

System Engineering personnel generated an Engineering Assistance Request (EAR) to evaluate and resolve the setpoint concern. The EAR was transmitted to Design Engineering-Nuclear (DEN) for resolution. As part of an initial setpoint program, DEN performed a preliminary calculation to obtain an estimate of the PPLS setpoint uncertainty. Technical Specification 2.14 "Engineered Safety Features System Initiation Instrumentation Settings" section (2) states:

Pressurizer Low Pressure

The pressurizer low pressure safety injection signal is a diverse signal to the high containment pressure safety injection signal. The 1600 psia setting includes an uncertainty of plus or minus 22 psia and is the setting used in the safety analysis. The Updated Safety Analysis Report (USAR), Section 14.1.3 lists the PPLS trip setpoint as 1600 psia, uncertainty plus or minus 22 psia, and the setpoint used in the analysis is 1578 psia.

When compared to the allowable uncertainty stated in the Technical Specifications (TS), the results of this calculation indicated that further investigation was warranted. Further calculations were performed by DEN on the following three cases: i) the Potential Uncertainty - generic worst case based upon the existing calibration requirements, ii) the Present Uncertainty - based upon the actual calibration data obtained from the last performed calibration procedure for the PPLS loops, and iii) the Recommended Uncertainty - based on DEN proposed revisions to the calibration procedures to reduce the uncertainties to within acceptable limits.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 2150-0104

EXPIRES 8/31/95

FACILITY NAME (1)

DOCKET NUMBER (2)

LER NUMBER (3)

PAGE (3)

Fort Calhoun Station Unit No. 1

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TEXT (If more space is required, use additional NRC Form 288a (1) (17))

The result of the Potential Uncertainty calculation revealed a worst case value of 41 psia uncertainty. This worst case uncertainty could have allowed the PPLS trip setpoint to be as low as 1559 psia, thus falling below the TS 2.14 requirement and the USAR analysis limit of 1578 psia.

The result of the Present Uncertainty calculation, using data from the last performed calibration procedure, revealed a maximum uncertainty of +/- 21.9 psia. This value is within the TS and USAR allowable uncertainty limits.

The result of the Recommended Uncertainty calculation, using revised instrument accuracies and a more conservative calibration setpoint (1605 psia vs. 1600 psia), revealed a value of 22 psia uncertainty. The higher calibration setpoint of 1605 psia, in addition to the revised instrument accuracies, will provide sufficient margin to assure compliance with the TS requirement.

DEN notified System Engineering and station management of the results of their calculations, and a reportability determination was performed. Since the potential existed for the pressurizer pressure instrument loops to be calibrated in a manner which could have resulted in their inability to trip PPLS within the design analysis limit, this condition was determined to be reportable pursuant to 10 CFR 50.73 (a)(2)(v) and (vi). On June 6, 1991, at 1728 CST, a four hour notification was made pursuant to 10 CFR 50.72 (b)(2)(iii). A two-week extension for submitting this LER was granted by Mr. R. P. Mullikin, NRC Senior Resident Inspector, on July 8, 1991.

The event discussed herein is potentially significant from a safety standpoint. Although it did not violate the Technical Specifications or any design basis, the potential existed for the PPLS trip setpoint to have been outside of the analysis limit. Up to four instrument channels of the PPLS could have been inoperable.

The root cause of this event resulted from the lack of an established program to assure that the calibration procedures were written to meet the assumptions/inputs used in the setpoint calculations. The calibration procedures established at the time of plant start-up were used with what were then the industry standards, methodologies and available design basis information.



## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104  
EXPIRES 8/31/85

|  |                                     |                |                   |                 |          |    |
|--|-------------------------------------|----------------|-------------------|-----------------|----------|----|
| FACILITY NAME (1)<br><br>Fort Calhoun Station Unit No. 1 | DOCKET NUMBER (2)<br><br>0500028591 | LER NUMBER (5) |                   |                 | PAGE (3) |    |
|  |                                     | YEAR           | SEQUENTIAL NUMBER | REVISION NUMBER |          |    |
|  |                                     | 91             | 011               | 00              | 04       | 04 |

TEXT (If more space is required, use additional NRC Form 366A 2) (17)

Corrective Actions

OPPD has completed the evaluation (Calculation FC05565) ensuring that the PPLS trip setpoint meets TS requirements. The revision to the calibration procedures for the PPLS initiating loops will be completed prior to their next expected use (January, 1992).

OPPD has already embarked upon implementation of a program to evaluate remaining safety significant setpoints. This program is aimed at identifying other safety significant instrument loops that could have a problem similar to that identified in the PPLS circuitry. This program is tentatively scheduled to be completed by June, 1992, and consists of the following:

- 1) Identification of Level 1 setpoints (Level 1 setpoints are those that provide the basis for Limiting Safety System Settings and are primarily made up of RPS and ESF setpoints). This task has already been completed.
- 2) For each Level 1 setpoint identified, perform a preliminary screening analysis to determine if the potential existed for instrument loops to have been calibrated in a manner that might have resulted in a problem similar to that found on PPLS loops.
- 3) For any instrument setpoint or set of affected instrument loops identified in 2) above as having the potential for actuating non-conservatively, perform an immediate detailed analysis to determine the actual initiating setpoint based on As-Found/As-Left calibration data. Upon completion of any analysis, appropriate follow-up/corrective actions will take place as warranted.
- 4) Establishment of additional and more formalized controls to assure that calibration procedures reflect the design basis of setpoint calculations. These controls will initially cover Level 1 setpoints, and will be expanded to include other safety impacting setpoints.
- 5) Establishment of an updated setpoint calculational methodology incorporating current industry practices and standards.

Licensee Event Reports 89-021 and 88-016 also documented potential non-conservative setpoint conditions. The root cause(s) of these LERs are not common to the cause of LER 91-11.