

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

March 18, 1991  
LIC-91-0003L

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 91-02 for the Fort Calhoun Station

Please find attached Licensee Event Report 91-02 dated March 18, 1991. This report is being submitted pursuant to the requirements of 10 CFR 50.73(a)(2)(iv).

If you should have any questions, please contact me.

Sincerely,

*W. G. Gates*

W. G. Gates  
Division Manager  
Nuclear Operations

WGG/djm

Attachment

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

LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-330), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (2190-0100), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503

|                                 |  |                   |          |
|---------------------------------|--|-------------------|----------|
| 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 5 |

TITLE (4)  
VIAS Actuation during Primary System Sampling

| EVENT DATE (5) |     |      | LER NUMBER (6) |                   |                 | REPORT DATE |     |      | OTHER FACILITIES INVOLVED (8) |                  |   |   |   |   |   |   |   |   |  |             |
|----------------|-----|------|----------------|-------------------|-----------------|-------------|-----|------|-------------------------------|------------------|---|---|---|---|---|---|---|---|--|-------------|
| MONTH          | DAY | YEAR | YEAR           | SEQUENTIAL NUMBER | REVISION NUMBER | MONTH       | DAY | YEAR | FACILITY NAMES                | DOCKET NUMBER(S) |   |   |   |   |   |   |   |   |  |             |
| 1              | 2   | 0    | 9              | 9                 | 0               | 9           | 1   | 0    | 0                             | 2                | 0 | 0 | 0 | 3 | 1 | 8 | 9 | 1 |  | 0 5 0 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) |                |                                     |                     |  |  |  |  |  |  |
|                    |       | 20.402(b)  | 20.405(e)      | <input checked="" type="checkbox"/> | 50.73(a)(2)(iv)     | 73.71(i)   |  |  |  |  |  |
| POWER LEVEL (10)   | 11010 | 20.405(a)(1)(i)  | 50.38(e)(1)    |                                     | 50.73(a)(2)(v)      | 73.71(e)   |  |  |  |  |  |
|                    |       | 20.405(a)(1)(ii)   | 50.38(e)(2)    |                                     | 50.73(a)(2)(vi)     | OTHER (Specify in Abstract below and in Text, NRC Form 306a) |  |  |  |  |  |
|                    |       | 20.405(a)(1)(iii)  | 50.73(a)(2)(j) |                                     | 50.73(a)(2)(vii)(A) |  |  |  |  |  |  |
|                    |       | 20.405(a)(1)(iv)   | 50.73(a)(2)(k) |                                     | 50.73(a)(2)(vii)(B) |  |  |  |  |  |  |
|                    |       | 20.405(a)(1)(v)  | 50.73(a)(2)(l) |                                     | 50.73(a)(2)(x)      |  |  |  |  |  |  |

|                                       |  |                         |
|---------------------------------------|--|-------------------------|
| LICENSEE CONTACT FOR THIS LER (12)    |  | TELEPHONE NUMBER        |
| NAME                                  |  | AREA CODE               |
| D. S. Molzer, Shift Technical Advisor |  | 4 0 2 5 3 3 - ( 6 8 9 4 |

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

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NRC DS | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NRC DS |
|-------|--------|-----------|--------------|----------------------|-------|--------|-----------|--------------|----------------------|
|       |        |           |              |                      |       |        |           |              |                      |
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|  |  |       |     |      |
|--|--|-------|-----|------|
| SUPPLEMENTAL REPORT EXPECTED (14)  | EXPECTED SUBMISSION DATE (15)          | MONTH | DAY | YEAR |
| <input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE) | <input checked="" type="checkbox"/> NO |       |     |      |

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

On December 9, 1990, the shift chemist was obtaining a sample from the Reactor Coolant System pressurizer surge line. A Ventilation Isolation Actuation Signal (VIAS) was generated by a high alarm on process radiation monitor RM-062 when gas from the drain header was exhausted to the plant stack via the sample sink fume hood. This was apparently caused by accumulation of noncondensable gases in the sample piping due to a packing leak on a containment isolation valve, which caused a sampling line relief valve to lift and pressurize the waste disposal header.

Following re-evaluations of reportability, it was determined that the VIAS caused the containment isolation valves on the Containment Atmosphere Sampling Penetrations to close as designed. This actuation of a portion of the Containment Isolation Engineered Safety Feature System is reportable pursuant to 10 CFR 50.73(a)(2)(iv).

Corrective actions include repair of the valve packing leak, evaluation of and changes to the sampling procedure, and monitoring of the primary sample system.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20548, AND TO THE FRAMEWORK REDUCTION PROJECT (P-56-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

|                                 |                   |                |              |                |
|---------------------------------|-------------------|----------------|--------------|----------------|
| FACILITY NAME (1)               | DOCKET NUMBER (2) | LER NUMBER (3) |              | PAGE (3)       |
|                                 |                   | YEAR           | EVENT NUMBER | SECTION NUMBER |
| Fort Calhoun Station Unit No. 1 | 051000218         | 91             | 002          | 002 OF 05      |

TEXT (If more space is required, use additional NRC Form 305A's) (17)

At Fort Calhoun Station Unit No. 1, the Ventilation Isolation Actuation Signal (VIAS) is designed to mitigate a release of significant radioiodine or radioactive gas from the containment to the atmosphere from such sources as reactor coolant leaks. VIAS is initiated by a Safety Injection Actuation Signal (SIAS), a Containment Spray Actuation Signal (CSAS), or a Containment Radiation High Signal (CRHS). The CRHS feature employs five radiation monitors taking samples from the containment and/or ventilation stacks. Those monitors are RM-050, RM-051, RM-060, RM-061, and RM-062. Activity detected above the setpoint of any one of these monitors can initiate a CRHS. RM-061 and RM-062 duplicate the functions of RM-050 and RM-051, taking samples from the vent stack only.

The VIAS performs the following functions:

1. Closes the containment purge valves (if open),
2. Closes the containment pressure relief valves (if open),
3. Stops the containment purge fans (if running),
4. Closes the containment air sampling valves,
5. Opens the inlet and outlet vents to the safety injection pump rooms and the spent regenerate tank rooms,
6. Places the control room ventilation system in a filtered mode, and
7. Isolates the Waste Gas Decay Tank.

The primary chemistry sampling panel is located in the radiologically controlled area of the Auxiliary Building. An enclosed sample sink is adjacent to the sampling panel. The sink drain discharges to the waste disposal header. The sink enclosure is vented through a fume hood to the plant ventilation stack.

On December 9, 1990, Fort Calhoun Station was in Mode 1 at 100% power. At 1213 hours, the shift chemist was realigning valves at the sampling panel in preparation for obtaining a sample from the Reactor Coolant System (RCS) pressurizer surge line. The chemist had just throttled open the sampling valve to recirculate RCS flow to the Volume Control Tank (VCT), when he noticed liquid spray up from the sampling sink drain, located adjacent to the sampling panel. The chemist was informed by Control Room personnel that a VIAS had been generated by a high alarm on a process radiation monitor.

The Control Room operators confirmed that the VIAS had been initiated by a high alarm on RM-062. They then verified that all equipment required to function following a VIAS had operated as designed, with the possible exception of the Control Room HVAC System. An Emergency Notification System (ENS) telephone report was made to the NRC on December 9, 1990, at 1439 hours pursuant to 10 CFR 50.72(b)(2)(ii) based on the fact that VIAS had actuated. A follow-up call on December 12, 1990 verified that the Control Room HVAC System had functioned properly.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-830), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

|   |  |                |                   |                 |          |                |
|---|--|----------------|-------------------|-----------------|----------|----------------|
| FACILITY NAME (1)<br><br>Fort Calhoun Station Unit No.1 | DOCKET NUMBER (2)<br><br>0   5   0   0   0   2   8   5   9   1 | LER NUMBER (5) |                   |                 | PAGE (3) |                |
|   |  | YEAR           | SEQUENTIAL NUMBER | REVISION NUMBER |          |                |
|   |  | —              | 0   0   2         | —               | 0   0    | 0   3 OF 0   5 |

TEXT (If more space is required, use additional NRC Form 386A's) (17)

During initial preparation of this Licensee Event Report, it was determined that the VIAS is not an Engineered Safety Features (ESF) System as defined by Section 6.1.2.1 of the Fort Calhoun Station Unit No. 1 Updated Safety Analysis Report (USAR), and thus its actuation was not reportable. The VIAS is defined as part of the Engineered Safeguards Controls and Instrumentation in USAR Section 6.1.2.3. Section 6.1 of the USAR had been updated in late 1989 to better categorize ES equipment and provide guidance on what ES equipment actuation was reportable. USAR Section 6.1.5 notes that generally only actuation of equipment within an ESF System as per Section 6.1.2.1 is reportable.

The Acting Resident Inspector was notified and the ENS call was retracted. However, subsequent discussions of this event's reportability among NRC and Omaha Public Power District (OPPD) personnel prompted further evaluation.

During this event, the normally open containment air sampling isolation valves had closed upon receipt of the valid VIAS. These valves are part of the Containment Isolation System, which is an Engineered Safety Feature as defined in Section 6.1.2.1 of the USAR. Therefore, OPPD determined on February 15, 1991 that the event should be reported pursuant to 10 CFR 50.73(a)(2)(iv).

An investigation into this event determined that when the chemist opened sampling valve SL-170 to recirculate the RCS sample to the VCT, the relief valve SL-171 lifted, causing the waste disposal header to become momentarily pressurized. The discharge from relief valve SL-171 goes directly to the waste disposal header. Given the close proximity to where SL-171 discharges into the waste header and the location of the sample sink drain, the pressurization of the header caused the liquid in the sample sink's drain trap to be blown out into the sample sink enclosure. This allowed gas from the drain header and a portion of the liquid/gas mixture being discharged from the relief to be exhausted to the plant stack via the sample sink fume hood. The activity was high enough that it caused RM-062 to go into alarm. Within 15 seconds of the initial spike on RM-062 the reading dropped below the computer alarm setpoint (4000 cpm) on the alarm printer.

The primary sampling procedure the chemist was using specified that the sample system pressure must be maintained below 40 psig as indicated on the local pressure indicator. This was to ensure system pressure did not exceed the 50 psig relief setpoint of SL-171. The chemist was aware of this requirement and attempted to maintain pressure below 40 psig by slightly cracking open the sample valve, but was unsuccessful due to the pressure fluctuations caused by the gas contained in the sample flow. Consequently, relief valve SL-171 lifted.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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|--|--|----------------|--------------------------------|--------------------------|----------|----------|
| FACILITY NAME (1)<br><br>Fort Calhoun Station Unit No. 1 | DOCKET NUMBER (2)<br><br>0   5   0   0   0   2   8   5 | LER NUMBER (6) |                                |                          | PAGE (3) |          |
|  |  | YEAR<br>9   1  | SEQUENTIAL NUMBER<br>0   0   2 | REVISION NUMBER<br>0   0 | 0   4    | OF 0   5 |

\* more space is required, use additional NRC Form 388A's (17)

Discussion with the chemists indicated that the only time an excessive amount of gas was observed during primary sampling was when a sample was drawn from the pressurizer surge line. The most probable explanation for this phenomenon is that the reactor coolant water contained in the sample tubing between the sample valves and the containment isolation valve became depressurized, causing noncondensable gases to be released from solution. The gas then accumulated in the highest section of piping which is located downstream of the sample point for the pressurizer surge line. When a sample was drawn from the pressurizer surge line, the gas contained in this elevated portion of piping was carried along with the sample flow. The most likely cause for the sample coolant depressurization was a known packing leak on the sampling containment isolation valve HCV-2504A located inside containment.

Although it could not be positively determined, the most probable primary cause of this event was the difficulty the chemist experienced in controlling sample system pressure due to the excessive amount of gas present when the pressurizer surge line was sampled. This apparently resulted from the packing leak on HCV-2504A.

The following corrective actions have been taken:

- (1) The packing leak on containment isolation valve HCV-2504A was repaired.
- (2) Chemistry has monitored the primary sampling system to identify any noticeable decrease in noncondensable gases during sampling following the packing leak repair on HCV-2504A. The amount of noncondensable gases has been substantially reduced.
- (3) The chemistry sampling procedure was evaluated and minor changes were made to prevent recurrence of this event.

This event has been evaluated as having minimal safety significance. The gas that was exhausted into the ventilation duct via the sample hood had a high enough activity to cause radiation monitor RM-062 to alarm (VIAS setpoint is 10,900 cpm), and consequently initiate a VIAS. However, the maximum activity on RM-062 cannot be positively determined; the multipoint strip chart recorders (RR-49, 49A) for the process radiation monitors were not able to record the peak activity for RM-062 since the actual release was of too short a duration.

Therefore, an estimate of the instantaneous site boundary concentrations was performed (assuming a thirty second release duration based on the Control Room alarm log) to ensure the release did not exceed the requirements of 10 CFR 20.106. The assumptions used in the dose calculations were very conservative in order to provide the most limiting radiological conditions that would have occurred as a result of this event. Results of this analysis show the requirements of 10 CFR 20.106 were not exceeded. The estimated maximum MPC fraction at the site boundary for the most limiting isotope was calculated to be 0.1768, and the total activity released was 0.0549 Ci.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20565, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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|--|--|----------------|-------------------|-----------------|----------|----------|
| FACILITY NAME (1)<br><br>Fort Calhoun Station Unit No. 1 | DOCKET NUMBER (2)<br><br>0   5   0   0   0   2   8   5   9   1   — | LER NUMBER (8) |                   |                 | PAGE (3) |          |
|  |  | YEAR           | SEQUENTIAL NUMBER | REVISION NUMBER |          |          |
|  |  | 0   0   2      | —                 | 0   0           | 0   5    | OF 0   5 |

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

LERs 87-20 and 39-04 were written to address other valid VIAS actuations. Other inadvertent actuations of VIAS were reported in LERs 87-05, 87-06, 87-08, 87-09, 87-12, 87-24, 88-15 88-26, 88-38, and 90-02. None of these previous LERs resulted from the same cause as this event.