

Omaha Public Power District

P.O. Box 399 Hwy. 75 - North of Ft. Calhoun Fort Calhoun, NE 68023-0399
402/636-2000

September 16, 1992
LIC-92-260L

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

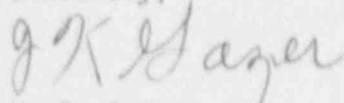
Reference: Docket No. 50-285

Gentlemen:

Subject: Licensee Event Report 92-027 for the Fort Calhoun Station

Please find attached Licensee Event Report 92-027 dated September 16, 1992.
This report is being submitted pursuant to 10 CFR 50.73(a)(2)(ii)(B). If you
should have any questions, please contact me.

Sincerely,



for W. G. Gates
Division Manager
Nuclear Operations

WGG/lah

Attachment

c: J. L. Milhoan, NRC Regional Administrator, Region IV
S. D. Bloom, 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: 50.0 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 5

PAGE (3)

TITLE (4)

Stop Valve Upstream of Relief Valve in Chemical and Volume Control System

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	8	1	7	9	2	9	2	0	2	7	0 0 0 9 1 6 9 2
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											0 5 0 0 0 0 0 0 0 0

OPERATING MODE (9)

1

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 55. (Check one or more of the following) (11)

POWER LEVEL (10)

1 0 0

20.402(b)

20.405(a)(1)(i)

20.405(a)(1)(ii)

20.405(a)(1)(iii)

20.405(a)(1)(iv)

20.405(a)(1)(v)

20.405(c)

50.39(c)(1)

50.39(c)(2)

50.73(a)(2)(i)

50.73(a)(2)(ii)

50.73(a)(2)(iii)

50.73(a)(2)(iv)

50.73(a)(2)(v)

50.73(a)(2)(vi)

50.73(a)(2)(vii)(A)

50.73(a)(2)(vii)(B)

50.73(a)(2)(viii)

73.71(b)

73.71(c)

OTHER (Specify in Abstract below and in Tel., NRC Form 380A)

LICENSEE CONTACT FOR THIS LER (12)

NAME

William J. Blessie, Shift Technical Advisor

TELEPHONE NUMBER

AREA CODE

4 0 2 5 3 3 1 - 1 6 8 9 1 6

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

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 fifteen single-space typewritten lines) (16)

A bypass line, associated with one of two charging flow paths from the Chemical and Volume Control System (CVCS) to the Reactor Coolant System (RCS) cold legs, includes a spring-loaded check valve (CH-202). The original purpose of the bypass line was to provide an alternate flow path for the charging pumps and limit upstream system pressure (providing a thermal relief function for the CVCS regenerative heat exchanger). On August 17, 1992, it was determined that a normally open stop valve (HCV-247) between the regenerative heat exchanger and CH-202 did not conform to applicable code requirements because HCV-247 cannot be locked open.

The safety significance of this event is minimal, because it would not adversely impact the operability of safety-related components required to shut down the reactor or mitigate the consequences of an accident.

The root cause of this event is attributed to an inadequate design review with respect to the thermal relief function of CH-202, on the part of the preparer and reviewers of a modification which originally installed HCV-247 in 1983.

As an interim action, a caution tag has been hung on the HCV-247 control switch to ensure that the valve is not inadvertently closed. A permanent resolution of this issue will be developed.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 80.0 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.

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		

TEXT (If more space is required, use additional NRC Form 895A's)(17)

The Fort Calhoun Station (FCS) Chemical and Volume Control System (CVCS) is designed to perform several functions including maintaining the reactor coolant chemistry and purity within specifications, maintaining the reactor coolant volume within programmed limits and providing a means of adding and removing boron to control reactor reactivity level changes. The CVCS includes a regenerative heat exchanger that partially cools the letdown reactor coolant from a cold leg of the Reactor Coolant System (RCS). After appropriate processing of the letdown coolant by the CVCS, the charging pumps return the coolant to the RCS by way of the shell side of the regenerative heat exchanger. After the heat exchanger, the charging piping splits into flow paths to two RCS cold legs (RCS Loops 1A and 2A) and to the pressurizer for auxiliary spray (Figure 1).

Prior to 1983, the flow paths to the two RCS cold legs each had a single isolation valve (HCV-238 for the Loop 1A flow path and HCV-239 for the Loop 2A flow path). The Loop 1A flow path included a bypass line, with a spring-loaded check valve (CH-202) and a stop valve (CH-345) in series, around isolation valve HCV-238. The primary purpose of the bypass line was to provide an alternate flow path for makeup in the event the valves in the normal flow paths were shut. The spring-loading of the check valve would ensure flow to the normal charging flow paths during normal operation. However, if a differential pressure in excess of the spring-loaded check valve set pressure were to develop, CH-202 would open to allow flow through the bypass line. Thus, in addition to providing an alternate flow path for the charging pumps, the bypass line and spring-loaded check valve would function to limit upstream system pressure. This capability of CH-202 was used as justification for not installing a conventional thermal relief valve on the regenerative heat exchanger.

In 1983, as part of modification MR-FC-79-165, "Long Term Core Cooling," redundant isolation valves HCV-247 and HCV-248 were installed in series with and upstream of the existing charging header isolation valves (HCV-238 and HCV-239 respectively) to ensure that the normal charging flow paths would remain isolated in the event that simultaneous hot and cold leg injection were to be required for Long Term Core Cooling (LTCC) following a Loss of Coolant Accident (LOCA). Valve HCV-247 was installed upstream of the bypass line around HCV-238.

ABB-Combustion Engineering (ABB-CE) issued CE TechNote No. 92-03, "Compliance of CVCS Configuration with ASME Code," on March 26, 1992. This TechNote provided information regarding the applicability of ASME code requirements to a generic CVCS configuration in CE plants wherein a locked open stop valve (CH-345 at FCS) is located downstream of a spring-loaded check valve (CH-202 at FCS).

Review of the applicable piping sign codes for FCS in response to the TechNote determined that intervening stop valves are not allowed between the piping being protected and its protective devices or between the protective devices and the point of discharge unless specified conditions are met. When such a stop valve is provided, it shall be so arranged that it can be locked or sealed open. Based on this provision, it was determined that having a locked-open stop valve (CH-345) downstream of the spring-loaded check valve (CH-202) is acceptable.

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 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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TEXT (If more space is required, use additional NRC Form 360A's)(17)

Although not specifically addressed in the TechNote, consideration was also given to the acceptability of valve HCV-247, which is located between the regenerative heat exchanger and CH-202. It was determined that locking HCV-247 open is the only accepted control that meets the applicable code requirement to prevent inadvertent closure of the valve. However, HCV-247 cannot be locked open because its control switch is not of the key-lock type. HCV-247 is a normally open, solenoid-operated valve that fails open.

On August 17, 1992 at 1120, with the Fort Calhoun Station operating in Mode 1 (Power Operation) at 100% power, it was determined that the presence of HCV-247 upstream of CH-202 did not conform to applicable code requirements, and constituted a reportable condition outside the plant design basis. A one-hour notification was made to the NRC at 1213 pursuant to 10 CFR 50.72(b)(1)(ii)(B). This report is being submitted pursuant to 10 CFR 50.73(a)(2)(ii)(B).

The safety significance of this event is minimal, because it does not adversely impact the operability of safety-related components required to shut down the reactor or mitigate the consequences of an accident. Due to the off-normal CVCS alignments necessary to create an undesirable situation, this event does not create a significant concern regarding equipment integrity.

If CH-202 was unable to provide thermal relief for the shell side of the regenerative heat exchanger, a pressure rise in the heat exchanger and adjacent charging piping could occur (the charging pumps are each protected by suction and discharge relief valves). This situation could only be created if HCV-247 was closed, the other charging flow path and pressurizer auxiliary spray flow path were isolated and hot letdown water on the tube side was available to the regenerative heat exchanger. Isolation of the charging flow path would be an off-normal CVCS alignment.

As previously noted, HCV-247 was installed in 1983 under modification MR-FC-79-165. The original conceptual sketches for the desired LTCC modifications showed a new redundant isolation valve immediately adjacent to HCV-238, with the CH-202 bypass line bypassing both valves. The MR-FC-79-165 Preliminary Design, Final Design and Construction design change packages were reviewed and none contained a discussion of the relationship between the proposed new valve (HCV-247) and the spring-loaded check valve (CH-202). It was determined that a description of CH-202's thermal relief function was available during the design phase of MR-FC-79-165, in the CVCS System Description document. The objective in installing HCV-247 and HCV-248 was to provide redundant isolation capability for the two normal charging flow paths during LTCC operations, and that objective was achieved.

The root cause of this event is attributed to an inadequate design review with respect to the thermal relief function of CH-202, on the part of the preparer and reviewers of modification MR-FC-79-165 which originally installed HCV-247. The design review process has been improved since installation of this modification in 1983.

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 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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		YEAR	SEQUENTIAL NUMBER	PREVIOUS NUMBER			

TEXT If more space is required, use additional NRC Form 385A(s) (17)

The spring-loaded check valve application is unique to this portion of the CVCS and is not used elsewhere. For this reason, it is concluded that this event does not have generic implications.

As an interim action, a caution tag has been hung on the HCV-247 control switch indicating that HCV-247 is to remain open at all times unless simultaneous hot and cold leg injection is required, or surveillance test stroking of the valve is to be performed.

The following corrective actions will be completed:

- 1) A permanent resolution of this issue will be developed and scheduled by January 31, 1993 in accordance with OPPD procedures for modification control.
- 2) Plant procedures will be reviewed and revised as necessary to provide guidance on proper operation of HCV-247. Appropriate revisions, except for Emergency Operating Procedures (EOPs) and Abnormal Operating Procedures (AOPs), will be completed by November 30, 1992. EOPs and AOPs will be reviewed and revised as necessary by December 31, 1992.

LER 91-003 reported a previous event involving a situation in which CVCS Containment Penetration M-3 was determined to be outside its design basis with respect to 10 CFR 50 Appendix J testing.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 60.0 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.

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TEXT (If more space is required, use additional NRC Form 895A's)(17)

FIGURE 1

