

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

January 31, 1992  
LIC-92-046L

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

References: 1. Docket No. 50-285  
2. LER 91-027, Revision 0, from OPPD (W. G. Gates) to NRC  
(Document Control Desk) dated December 18, 1991 (LIC-91-282L)  
3. Letter from OPPD (W. G. Gates) to NRC (R. D. Martin) dated  
January 13, 1992 (LIC-92-005R)

Gentlemen:

Subject: Licensee Event Report 91-027, Revision 1 for the Fort Calhoun  
Station

Please find attached Licensee Event Report 91-027, Revision 1, dated  
January 31, 1992. This supplement provides the results of Omaha Public Power  
District's review of other non-routine Chemistry sample analysis reports  
performed during Cycle 13. The revisions are identified by a vertical line in  
the right margin. This report is being submitted pursuant to 10 CFR  
50.73(a)(2)(i)(B).

If you should have any questions, please contact me.

Sincerely,

*W. G. Gates*

W. G. Gates  
Division Manager  
Nuclear Operations

WGG/lah

Attachment

c: R. D. Martin, NRC Regional Administrator  
D. L. Wigginton, NRC Senior Project Manager  
S. D. Bloom, NRC Project Engineer  
R. P. Mullikin, NRC Senior Resident Inspector  
INPO Records Center

45-5124 030053

Employment with Equal Opportunity  
Male/Female

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## LICENSEE EVENT REPORT (LER)

ESTIMATED PAPERWORK BURDEN PER RESPONSE TO COMPLY WITH THIS REGULATORY COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS MANAGEMENT BRANCH, P-535, U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (D150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)  
Fort Calhoun Station Unit No. 1

DOCKET NUMBER (8)  
05000285

PAGE (8)  
1 OF 07

TITLE (4)  
Violation of Containment Integrity by Opening WD-1060 During Sampling

EVENT DATE (6)			LER NUMBER (6)		REPORT DATE (7)			OTHER FACILITIES INVOLVED (6)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES
11	18	91	91	027	01	01	13	92	N

OPERATING MODE (6)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (1) (Check one or more of the following) (11)																								
1	<table border="1"><tr><td>20.402(b)</td><td>20.405(c)</td><td>50.73(a)(2)(iv)</td><td>79.71(b)</td></tr><tr><td>20.405(a)(1)(i)</td><td>50.36(c)(1)</td><td>50.73(a)(2)(v)</td><td>79.71(c)</td></tr><tr><td>20.405(a)(1)(ii)</td><td>50.36(c)(2)</td><td>50.73(a)(2)(vi)</td><td>OTHER (Specify in Abstract Section and in Text, NRC Form 506A)</td></tr><tr><td>20.405(a)(1)(iii)</td><td><input checked="" type="checkbox"/> 50.73(a)(2)(i)</td><td>50.73(a)(2)(vii)(A)</td><td></td></tr><tr><td>20.405(a)(1)(iv)</td><td>50.73(a)(2)(ii)</td><td>50.73(a)(2)(vii)(B)</td><td></td></tr><tr><td>20.405(a)(1)(v)</td><td>50.73(a)(2)(iii)</td><td>50.73(a)(2)(viii)</td><td></td></tr></table>	20.402(b)	20.405(c)	50.73(a)(2)(iv)	79.71(b)	20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	79.71(c)	20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vi)	OTHER (Specify in Abstract Section and in Text, NRC Form 506A)	20.405(a)(1)(iii)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)	50.73(a)(2)(vii)(A)		20.405(a)(1)(iv)	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)(viii)	
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20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	79.71(c)																						
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20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(viii)																							

NAME  
Scott A. Lindquist, Shift Technical Advisor

TELEPHONE NUMBER  
AREA CODE  
402 533-1682

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (18)										
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) ☒ NO

EXPECTED SUBMISSION DATE (15)  
MONTH DAY YEAR

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

While operating at 100 percent power, reactor coolant drain tank (RCDT) pump discharge test valve WD-1060 was used to obtain 20 RCDT samples between October 16, 1991, and November 18, 1991, during the investigation of abnormal increases in tank level. WD-1060 is a 3/8 inch seal wired closed containment isolation valve (CIV) which taps off the RCDT pump discharge header between CIVs HCV-500A and HCV-500B. Opening of WD-1060 violated containment integrity as required by Technical Specification 2.6.(1). This report is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(B).

The root cause of this event was the lack of formality in establishing the RCDT sampling program for the RCDT increased leakage investigation. Contributing causes include: no approved procedure for non-routine sampling, lack of understanding/training related to opening seal wired valves, and no labeling of seal wires.

Although containment integrity was violated, this event did not endanger the health and safety of the public because WD-1060 was closed after the sample was obtained; during the very short period for sampling, the Shift Chemist maintained control of WD-1060; the General Design Criterion was met by CIV HCV-500B; HCV-500A/B have been successfully quarterly stroke tested; and, the 1990 Refueling Outage Local Leak Rate Test results show that there is no leakage through these valves.

Corrective actions include: development of a method to ensure adequate review and approval for troubleshooting and non-routine sampling activities, revision of chemistry procedures, review of station standing orders, appropriate training, and development of a label for locked closed valves.

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-500), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND JURISDICTION, WASHINGTON, DC 20503.

FACILITY NAME (1)  Fort Calhoun Station Unit No. 1	DOCKET NUMBER (2)  0   5   0   0   0   2   8   5   9   1   —	LER NUMBER (3)			PAGE (4)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		9   1   —	0   2   7   —	0   1	0   2	OF 0   7

TEXT: If more space is required, use additional NRC Form 308A's (17)

At Fort Calhoun Station (FCS) Unit No. 1, the reactor coolant drain tank (RCDT) is the collection point for pressurizer quench tank drains, reactor coolant loop drains, control element drive mechanism leakage, safety injection system leakage, reactor coolant pump seal leakage and various other sources. This water contains fission product gases and radioactive isotopes from the reactor coolant system.

The RCDT and containment waste drain system are classified as a closed system for purposes of containment isolation per Updated Safety Analysis Report (USAR) Section 5.9, and as such, requires at least two containment isolation valves outside containment for systems which normally operate at pressures less than maximum containment atmospheric pressure. Containment isolation valves, HCV-500A and HCV-500B, meet this criteria and are normally open valves which fail closed and which close upon receipt of a Containment Isolation Actuation Signal (CIAS).

10 CFR 50 Appendix A, General Design Criterion 57 - Closed System Isolation Valves, states that for closed systems "each line that penetrates primary reactor containment and is neither part of the reactor coolant pressure boundary nor connected directly to the containment atmosphere shall have at least one containment isolation valve which shall be either automatic, or locked closed, or capable of remote manual operation. This valve shall be outside containment and located as close to the containment as practical. A simple check valve may not be used as the automatic isolation valve". HCV-500B meets this criterion.

RCDT pump discharge test valve WD-1060 is a 3/8 inch seal wired closed containment isolation valve which taps off the RCDT pump discharge header between HCV-500A and HCV-500B (See Figure 1). WD-1060 is seal wired closed because opening of the valve with HCV-500B open, violates containment integrity as required in Technical Specification 2.6.

In early October, 1991, Operations personnel noted increased leakage to the RCDT and an investigation was initiated to determine the source of the leakage. It was decided that if the chemical and activity concentrations of the RCDT were determined, then the possible leakage sources to the RCDT could be identified. Operations personnel discussed possible sampling methods and decided a containment entry would be required to sample the RCDT.

On October 7, 1991, under a Priority 1 Maintenance Work Order (MWO 917161), an Operator and an Instrument and Control Technician entered containment and obtained an RCDT sample by disconnecting a fitting on RCDT pump discharge pressure transmitter root valve WD-873. The Radwaste System Engineer was not aware of this activity until his review of the maintenance work order following completion of the work. The System Engineer was not involved in the discussion prior to generation of this maintenance work order where it was decided that a containment entry was required in order to not violate containment integrity.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THE INFORMATION COLLECTION REQUEST: 30.3 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-500), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20540, 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)  015000028591-027-0103 OF 07	LER NUMBER (3)			PAGE (6)	
		YEAR	SEQUENTIAL NUMBER	PREVIOUS NUMBER		

TEXT (If more space is required, use additional NRC Form 355A(s) (17))

Leakage into the RCDT continued and System Engineering became more involved in troubleshooting activities at the request of Operations and Plant Management. The Radwaste System Engineer decided that additional samples were required to identify the inleakage. Because of the difficulty in obtaining the first sample, the System Engineer looked for a sample point outside containment. The System Engineer identified WD-1060 as a possible sample point and questioned an Auxiliary Building Equipment Operator on the possibility of obtaining an RCDT sample through WD-1060. The Operator indicated that the RCDT could be sampled through WD-1060 but failed to communicate the administrative controls regarding repositioning of seal wired valves.

At that time, the System Engineer was not aware that WD-1060 is a containment isolation valve. Standing Order O-44, "Administrative Control for Locking of Components", controls the operation of seal wired valves. The standing order requires that operation of these valves be logged in the Locked Component Deviation Log with the approval of the Shift Supervisor or be performed in accordance with a Plant Review Committee (PRC) approved procedure.

The System Engineer decided WD-1060 was a viable sample point and discussed the need for sampling with the responsible Chemistry supervisor. The Chemistry supervisor was satisfied that the sample could be performed and indicated that the System Engineer should work directly with the Shift Chemist. Standing Order O-1, "Conduct of Operations", allows qualified Chemistry personnel to reposition valves to aid in routine primary, secondary and auxiliary system sampling. The plan was to obtain a sample from WD-1060 immediately after the Auxiliary Building Operator pumped down the RCDT during his normal shift duties. This eventually became routine on night shift. A procedure was not used to perform the sample. A PRC approved procedure is not required to obtain chemistry samples. The samples were obtained without the removal or destruction of the seal wire. To obtain a sample, WD-1060 was opened one-half turn and approximately 500 milliliters of RCDT liquid was drained to a floor drain, then a 500 milliliter sample was taken and WD-1060 closed. HCV-500A and HCV-500B were open during the sampling and both RCDT pumps were off. This process took approximately forty-five (45) seconds to complete. All samples were taken in a similar fashion.

Samples were taken on October 16, 29, 31, and daily from November 2 through November 18, 1991. On November 18, 1991, the PRC became aware of where the samples were being taken during a System Engineering briefing on the status of the RCDT inleakage investigation. The PRC identified the violation of containment integrity and discontinued further sampling. This report is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(B).

If WD-1060 is left open and HCV-500B fails to close on receipt of a CIAS, the potential exists for the release of radioactive liquid and gases to the Auxiliary Building. However, WD-1060 was open for only short periods of time during sampling and was closed after sampling was completed. USAR Section 5.9.5 allows credit to be taken for manually operated containment isolation valves when operation of these valves is under administrative control. However, to meet the definition of containment integrity per the Technical Specifications would also have required other actions to be taken prior to opening WD-1060. Although there were no formal administrative controls in place, WD-1060 was in the control of the Shift Chemist throughout the sampling.



LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 95.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-500), 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   0   0   0   0   2   8   5   9   1   —   0   2   7   —   0   1   0   4   OF   0   7	LIR NUMBER (3) <table border="1"><thead><tr><th>YEAR</th><th>SEQUENTIAL NUMBER</th><th>REVISION NUMBER</th></tr></thead><tbody><tr><td></td><td></td><td></td></tr></tbody></table>	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER				PAGE (5)  0   4   OF   0   7
YEAR	SEQUENTIAL NUMBER	REVISION NUMBER							

TEXT (If more space is required, use additional NRC Form 566A's)(17)

Although containment integrity was violated, this event did not endanger the health and safety of the public because WD-1060 was closed after the samples were obtained; the Shift Chemist maintained control of WD-1060 throughout the very short sampling period; the General Design Criterion was met by HCV-500B; HCV-500A and HCV-500B have been successfully stroke tested quarterly and are therefore considered as operable valves; and, the 1990 Refueling Outage Local Leak Rate Test results show that there is no leakage through these valves and would adequately isolate containment following a CIAS signal.

The root cause of this event was a lack of formality in setting up the RCDT sample. WD-1060 was established as a sample point without a formal review by all departments involved. In addition, the lack of knowledge of the sampling effort by various personnel inhibited their ability to identify the containment integrity problem.

Contributing causes include: no approved procedure for the non-routine sampling, lack of understanding/training related to opening seal wired closed valves, and no labeling of seal wires on valves.

Corrective actions that will be taken to prevent recurrence include:

- 1) Establish management expectations for the need and implementation of formalized plans for significant non-routine activities/programs. This will be completed by February 1, 1992.
- 2) Establish management expectations for the proper coordination and implementation of troubleshooting or other minor activities (not requiring a formalized plan or procedure) that may affect plant operations. This will be completed by February 1, 1992.
- 3) Develop a method to ensure adequate review and approval for sampling that involves operation of plant components when specific approved procedures are not applicable. This will be completed by January 20, 1992.
- 4) Revise chemistry procedures CMP 2.1, "Grab Sampling" and CMP 2.4, "Primary Sampling System - Normal Operation", to ensure that Standing Order 0-44 requirements for operation of locked valves are properly implemented for locked valves that are manipulated. This will be completed by January 26, 1992.
- 5) Coordinate a review of the station standing orders used by appropriate Nuclear Operations Division and Production Engineering Division departments at FCS. This review will identify those standing orders that may impact the operations of that department and ensure that they are included in the department's formal training program. This will be completed and training provided by September 1, 1992.
- 6) Provide training on this event and Standing Order 0-44 to Operations, Engineering and Chemistry department personnel that may operate station valves or direct their operation. This will be completed by February 1, 1992.

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.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (4)			PAGE (3)	
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Fort Calhoun Station Unit No. 1	0500028591	—	027	—	01	05 OF 07

TEXT (If more space is required, use additional NRC Form 888A's)(17)

- 7) Develop a label for locked valves (including fire protection) to identify the purpose of the locking device. This will be completed by February 1, 1992. The labels will be installed by the end of the 1992 Refueling Outage.
- 8) Review the use of seal wire on locked valves (particularly "T" handle valves) to determine if a more suitable locking method/device is available. This will be completed by February 1, 1992.
- 9) Inclusion of lessons learned from this event in affected department initial and continuing training by August 1, 1992.
- 10) Provide overview training on "self-checking" to Chemistry department personnel by February 1, 1992. Develop lesson plans and provide formal "self-checking" training to Chemistry department personnel by August 1, 1992.

OPPD completed a review of other non-routine Chemistry sample analysis reports performed during Cycle 13. Since the beginning of 1990, approximately 1,117 non-routine samples were taken. Based on this review, it was determined that containment integrity was violated during sampling which occurred via a capped test line between containment isolation valves HCV-506A and HCV-506B, on October 23, November 14 and December 6, 7 and 10, 1990. These samples were taken as a part of the effort to locate the Reactor Coolant System leakage, which ultimately was determined to be through the cracked Control Element Drive Mechanism (CEDM) assembly.

HCV-506A and HCV-506B are the containment sump pump (WD-3A and WD-3B) discharge header isolation valves (See Figure 2). During this sampling which only took approximately one minute to complete, the cap was not removed, only loosened to allow approximately one liter of liquid to be drained, and then the cap was retightened. Review of the Emergency Response Facility (ERF) computer alarm printouts indicated that HCV-506A and HCV-506B were open during all five sampling events.

Although containment integrity was violated during sampling in these five instances, the health and safety of the public was not endangered because postulated worst case dose calculations indicate that doses would be within the required limits. As stated in Reference 3, the final worst case dose calculations show that the subject condition was bounded by the existing Loss of Coolant Accident (LOCA) analysis for FCS.

As a result of this review, on December 17, 1991, OI-CO-5, "Containment Integrity", Checklist B was performed to verify that readily accessible Containment penetration caps located outside Containment were in place. All caps checked were found intact. This was later reverified during a Quality Assurance Audit on Containment integrity.

There have been no previous LERs submitted concerning occurrences of loss of containment integrity due to opening of seal wired closed valves at FCS. LER-88-011 was submitted concerning potential loss of containment integrity due to a missing cap from a test tee.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

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

FACILITY NAME (1)

DOCKET NUMBER (2)

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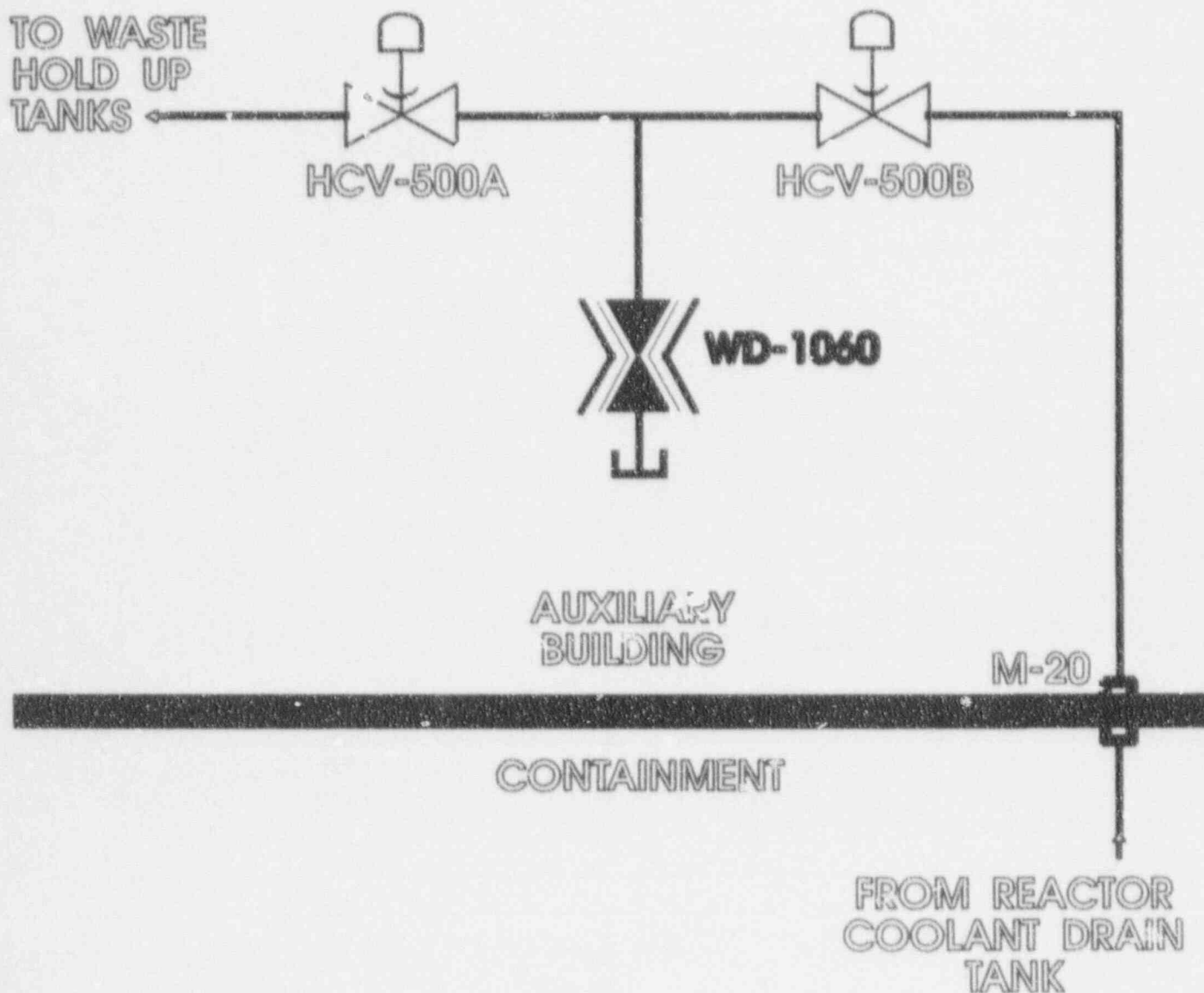
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Fort Calhoun Station Unit No. 1

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TEXT (If more space is required, use additional NRC Form 388A/g)(17)

FIGURE 1

**VALVE CONFIGURATION**

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

FIGURE 2

# **VALVE CONFIGURATION**

