

Omaha Public Power District

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

May 24, 1993
LIC-93-0062

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 93-005 for the Fort Calhoun Station

Please find attached Licensee Event Report 93-005 dated May 24, 1993. This report is being submitted pursuant to 10 CFR 50.73(a)(2)(v). If you should have any questions, please contact me.

Sincerely,

W. G. Gates

W. G. Gates
Vice President

WGG/jrg

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

280021

JEH

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS
INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD
COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION
AND RECORDS MANAGEMENT BRANCH (MNBR 7714), U.S. NUCLEAR
REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, 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)

05000285

PAGE (3)

1 OF 7

TITLE (4)

Seismic Design of Safety Injection & Refueling Water Tank Filter Piping

EVENT DATE (5)			LER NUMBER (6)			REPORT NUMBER (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
04	22	93	93	-- 005 --	00	05	24	93	FACILITY NAME	DOCKET NUMBER
										05000
OPERATING MODE (9)		1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
POWER LEVEL (10)		77	20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)	
			20.405(a)(1)(i)		50.36(c)(1)		X 50.73(a)(2)(v)		73.71(c)	
			20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER	
			20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		(Specify in Abstract below and in Text, NRC Form 368A)	
			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

Matthew H. Pohl, Shift Technical Advisor

TELEPHONE NUMBER (include Area Code)

(402) 533-6820

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)

YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

In March 1983, Modification MR-FC-83-046 was initiated to, in part, provide an alternate method for recirculating the Safety Injection and Refueling Water Tank (SIRWT). Over a period of several years, the modification was partially installed and several changes were pursued in response to identified concerns. During the 1992 Refueling Outage, an Incident Report was initiated to address concerns that sections of the piping associated with MR-FC-83-046 had potentially been placed in operation prior to the 1992 Refueling Outage without proper operability acceptance of the modification. On June 3, 1992, following resolution of identified concerns, the piping was Accepted for Operability. Following an engineering evaluation, it was determined that previous use of SIRWT recirculation piping associated with MR-FC-83-046 was reportable.

A Root Cause Analysis found that inadequate standards, policies and administrative controls led to over-reliance on personnel knowledge for the accomplishment of modifications.

Improved administrative controls have been implemented since initiation of MR-FC-83-046. In addition, the current process for releasing equipment for testing prior to Acceptance for Operability will be reviewed.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

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

BACKGROUND

The Fort Calhoun Station (FCS) Safety Injection and Refueling Water Tank (SIRWT) is a carbon steel plate-lined concrete tank with a design capacity of 314,000 gallons. During plant operation, Technical Specification 2.3 requires the SIRWT to contain a minimum of 283,000 gallons of usable water at the refueling boron concentration. During emergency safety injection, the safety injection pumps and containment spray pumps take their suction from the SIRWT. The SIRWT provides more than 20 minutes of safety injection time with all pumps operating at design flow rates. Pump suction is automatically switched to the containment sump upon receipt of a Recirculation Actuation Signal (RAS).

The Fuel Transfer Canal Drain Pumps, AC-13A and AC-13B (or AC-13A/B), communicate with the SIRWT through piping and valves which are used during periodic recirculation and sampling of the SIRWT (see Figure 1). The pumps can also take suction off the SIRWT to supply make-up water to the Spent Fuel Pool, or take suction off the fuel transfer canal and discharge the water to the SIRWT.

EVENT DESCRIPTION

In March 1983, Modification MR-FC-83-046 was initiated to install piping and a filter through which water from the SIRWT, Fuel Transfer Canal, or Spent Fuel Pool could be circulated using the Fuel Transfer Canal Drain Pumps. The modification also proposed installing a new valve (WD-1161) into existing Waste Disposal System piping. With the proposed new valve installed and closed, Waste Disposal System piping could be used to provide an alternate flow path for SIRWT recirculation. The Plant Review Committee (PRC) approved the Construction Package in September 1985.

In November 1985, during a refueling outage, a field change to the modification was approved for partial installation of the modification, and WD-1161 was installed. An Independent Design Verification (IDV) found the partially installed configuration to be acceptable only if WD-1161 remained open. The System Acceptance Committee (SAC) found the WD-1161 installation to be acceptable for start-up only, with the stipulation that it not be closed when recirculating the SIRWT (effectively disallowing use of the alternate SIRWT recirculation flow path).

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In November 1986, construction work on the modification was restarted. In December 1986, a field change to MR-FC-83-046 was approved which altered the proposed piping configuration at the discharge of AC-13A/B. However, the stress analysis calculation for this field change was not re-evaluated to verify the acceptability of the revised piping configuration. The Safety Evaluation for the change indicated that the design basis of the modification had not changed. The PRC approved this field change and the change was installed. Pumps AC-13A/B were returned to service on December 19, 1986. Additional work remained before the SIRWT filter could be put in operation.

During the third quarter of 1988, Calculation FC0973 was performed on the revised piping configuration and found piping/pump discharge nozzle stresses to be unacceptable. Early in 1990, an alternate piping design model was found to be acceptable after completion of a revision to the piping stress analysis calculation. Field Design Change Request (FDCR) 89-849 was initiated to modify the piping design.

During preparation of FDCR 89-849, additional concerns were identified with the original design package. Therefore, it was proposed to abandon further plans to place the SIRWT filter in operation. However, the proposal would allow the alternate SIRWT recirculation flow path utilizing WD-1161 to be utilized. This proposal was approved by the PRC in May 1991, and an IDV was performed and completed on the FDCR and the modification in September 1991. A concern was then brought forward regarding recirculation of the SIRWT using non-seismic Waste Disposal System piping. A request was made to upgrade the piping to Seismic Class 1. The FDCR was modified to reflect the request, and in January 1992, the revised FDCR was approved by the PRC. This FDCR also included added requirements for radiography and hydrostatic testing of the welds completed under the original modification.

The 1992 Refueling Outage began on February 1, 1992. On April 29, 1992, Incident Report (IR) 920408 was initiated to address concerns that sections of the piping associated with MR-FC-83-046 had potentially been placed in operation prior to the 1992 Refueling Outage without proper operability acceptance of the modification. On June 3, 1992, following resolution of the seismic, piping stress, and non-destructive examination issues, the piping for recirculating the SIRWT using AC-13A/B was Accepted for Operability. The modification, as revised by the FDCR, received Final Acceptance on March 4, 1993.

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In April 1993, during the process of closing IR 920408, it was determined that the potential reportability of issues addressed by the IR had not been resolved. An engineering evaluation was performed, and on April 22, 1993 at 1103, with FCS operating in Mode 1 at 77% power, it was determined that the incident was reportable in that the SIRWT recirculation piping associated with MR-FC-83-046 had been used (between December 1986 and the 1992 Refueling Outage) in an unacceptable configuration. The NRC was notified on April 22, 1993 at 1411, pursuant to 10 CFR 50.72(b)(2)(iii)(A), (B) and (D). This report is being submitted pursuant to 10 CFR 50.73(a)(2)(v).

SAFETY ASSESSMENT

The safety significance of this event is considered to have been minimal. The piping in question was normally isolated from the SIRWT by locked closed valves. Approximately once a month, portions of the modified piping were placed in service for recirculating the SIRWT.

In the worst case scenario, AC-13B, with a design flow rate of 250 gpm, would be recirculating the SIRWT when a hypothetical earthquake causes a complete pipe break. As previously noted, the SIRWT is required to contain a minimum of 283,000 gallons of usable water. Assuming AC-13B were to continue to run for 20 minutes (the approximate amount of time for the SIRWT to be emptied by Safety Injection/Containment Spray flow in the event of a Design Basis Loss of Coolant Accident), a total of approximately 5,000 gallons of SIRWT water would be lost through the pipe break. This would result in an earlier RAS and less total coolant delivered to Containment. The Design Basis Loss of Coolant Accident Analysis assumes 250,000 gallons is delivered to containment, therefore the loss of 5,000 gallons is acceptable. A Small Break Loss of Coolant Accident would result in greater water loss through the pipe break, however, less coolant would be needed to mitigate the accident.

Pump AC-13A is load shed upon receipt of a Safety Injection Actuation Signal (SIAS). Consequently, postulating a similar scenario with AC-13A in service instead of AC-13B, would result in a lower flow rate through the pipe break (due to the load shedding of AC-13A) and therefore, less inventory being lost.

CONCLUSIONS

A Root Cause Analysis found that inadequate standards, policies and administrative controls led to over reliance on personnel knowledge for the accomplishment of modifications. This resulted in a lack of adequate technical reviews and poor communications.

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It was determined that improved administrative controls have been implemented since initiation of MR-FC-83-046. Improvements that have been made include issuance of Production Engineering Division (PED) procedures PED-QP-02, "Configuration Change Control"; PED-QP-03 "Calculation Preparation, Review and Approval"; PED-QP-11, "Multidiscipline Independent Design Verification (IDV) and Fire Protection Review"; PED-QP-19, "Evaluation of Potentially Reportable Conditions"; PED-QP-27, "Repair/Replacement Program"; PED-GEI-3, "Preparation of Design Change Packages"; and revisions to FCS Standing Order G-21, "Modification Control". Specifically, procedure PED-GEI-3 provides detailed instructions for the format and content of a modification package, and Standing Order G-21 addresses initiation, review and approval of modification requests, construction work control, field design changes, and modification testing and acceptance.

Additional review was determined to be warranted regarding returning equipment to service following a modification. The specific issue involves the need to ensure that if a portion of a modification is placed in service for testing prior to being declared operable, its use must be restricted until that portion of the modification is Accepted for Operability. It was also determined that the delay in completing the reportability determination following initiation of IR 920408 needed to be addressed.

A review was performed to identify other modifications for which construction has started, but which have not been Accepted for Operability. Three modifications, all associated with the Steam Generator Blowdown Processing System (SGBPS), were identified which predate the modification format established by PED-GEI-3. Action has been taken (as discussed in LER 92-031 Revision 01) to ensure that the SGBPS remains isolated.

CORRECTIVE ACTIONS

The concerns associated with the piping for recirculating the SIRWT using AC-13A/B were resolved (i.e., seismic supports were added to a section of Waste Disposal System piping, piping configuration was modified to eliminate unacceptable stresses, and some welds were reworked based on the results of non-destructive examinations), and the modification was Accepted for Operability on June 4, 1992.

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As previously discussed, new procedures and procedure changes that were implemented after the initiation of MR-FC-83-046 have improved the administrative controls for modifications. However, the following additional corrective actions will be completed:

1. The current process for releasing equipment for testing following a modification will be reviewed by September 1, 1993, to determine if additional controls are needed to address restricting the use of the equipment prior to Acceptance for Operability.
2. An Incident Report has been initiated to address the programmatic deficiency that allowed the reportability determination for IR 920408 to remain unresolved for almost a year. Appropriate action to address this issue will be completed by July 31, 1993. Interim measures have been implemented (i.e., periodic PRC review of IRs with open reportability issues) to track open reportability determinations.

PREVIOUS SIMILAR EVENTS

LER 92-027 reported a previous event involving a deficiency associated with a 1983 piping modification which installed a valve that did not conform to applicable code requirements.

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Figure 1
Piping Associated with Modification MR-FC-83-046

