

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

April 7, 1994
LIC-94-0080

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 94-002 for the Fort Calhoun Station

Please find attached Licensee Event Report 94-002 dated April 7, 1994. 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
Vice President

WGG/jrg

Attachment

c: LeBoeuf, Lamb, Greene & MacRae
I. J. Callan, 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)

(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 (MNBB 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 5
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TITLE (4)
Inoperability of Boric Acid Pump Due to Inappropriate Feeder Breaker

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
03	08	94	94	-- 002 --	00	04	07	94	FACILITY NAME	DOCKET NUMBER
										05000
										05000

OPERATING MODE (9) 1	POWER LEVEL (10) 10C	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)								
		20.402(b)			20.405(c)			50.73(a)(2)(iv)		73.71(b)
		20.405(a)(1)(i)			50.36(c)(1)			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)			X 50.73(a)(2)(i)			50.73(a)(2)(viii)(A)		(Specify in Abstract below and in Text, NRC Form 366A)
		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 Calvin C. Taylor, Shift Technical Advisor	TELEPHONE NUMBER (include Area Code) (402) 533-6754
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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
B	ED	52	G080	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO	EXPECTED SUBMISSION DATE (13)	MONTH	DAY	YEAR

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

On March 8, 1994, it was discovered that an inappropriate model of feeder breaker was installed for boric acid pump CH-4B. The range of adjustment for the instantaneous trip setting of the installed breaker was lower than the recommended setting for the pump motor. As a result, CH-4B was declared inoperable due to the inability to ensure reliable starting of the CH-4B motor.

The root cause of this event was determined to be improperly specified hardware. The inappropriate model of breaker has been installed since at least October 1991, and may have been installed as part of the original plant configuration.

The breaker was replaced with an appropriate model of breaker, and the breaker for the other boric acid pump (CH-4A) was verified to be appropriate. Subsequently, an initial review of the safety-related Motor Control Centers was conducted to confirm breaker sizing adequacy. This review determined that the existing breakers are adequately sized and properly set. Engineering Assistance Request 94-044 has been initiated to further evaluate Motor Control Center starter units and document the results.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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Fort Calhoun Station Unit No. 1	05000285	94	-- 002 --	00	2 OF 5

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

BACKGROUND

The Fort Calhoun Station (FCS) Chemical and Volume Control System (CVCS) includes two boric acid pumps (CH-4A and CH-4B) and two Boric Acid Storage Tanks (BASTs). The boric acid pumps can supply concentrated boric acid solution from the BASTs to the Volume Control Tank (VCT) or to the charging pump suction header.

Under certain emergency conditions, the charging pumps are used to inject concentrated boric acid into the Reactor Coolant System (RCS). The concentrated boric acid can be supplied to the charging pump suction header by one or both boric acid pumps. If the boric acid pumps are not operable, boric acid flows by gravity from the BASTs to the charging pump suction header. The elevation of the BASTs is sufficiently above the charging pump suction so as to provide adequate suction head to the charging pumps.

Technical Specification (TS) 2.2 addresses operability requirements for the CVCS. TS 2.2(3)b indicates that both boric acid pumps may be out of service for up to 24 hours during power operation. If one pump is not restored to operable status within 24 hours, the reactor is to be placed in Hot Shutdown.

EVENT DESCRIPTION

On March 1, 1994, a Maintenance Work Request (MWR) was initiated to troubleshoot MCC-4A2-C04, the pump motor feeder breaker for boric acid pump CH-4B, because the breaker tripped during an attempt to start pump CH-4B. After the breaker tripped, it was reset and the pump was started successfully on the second attempt. However, a MWR was initiated to investigate because it was believed that this was not the first occasion of this breaker tripping.

On March 8, 1994, a review of the FCS equipment information database (CHAMPS) indicated that the installed molded case circuit breaker was a General Electric (GE) model THEF136M1050 magnetic-only breaker. The CH-4B motor is a 460 volt, 30 horsepower (HP) motor, and review of GE information on selection of a breaker for such an application indicated that the correct model of breaker for this application would have been a model THEF136M2050. Both of these models are 50 ampere, magnetic-only breakers, having the same frame size, but the range of adjustment for the breakers' instantaneous trip setting is different. The trip setting range for a THEF136M1050 breaker is 156-360 amps while the range for a THEF136M2050 breaker is 250-570 amps. The recommended trip setting for a 460 volt, 30 HP motor is 506 amps. A THEF136M1050 breaker could not, therefore, be adjusted to obtain the recommended trip setting for the CH-4B motor.

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

On March 8, 1994 at 1025, with the plant in Mode 1 at approximately 100% power, CH-4B was removed from service for inspection of breaker MCC-4A2-C04, under the scope of Maintenance Work Order (MWO) 940662. The inspection confirmed that the installed breaker was actually a THEF136M1050 breaker. As a result, CH-4B was considered to be inoperable, due to the inability to ensure reliable starting of the CH-4B motor. Actions were then initiated to replace the breaker with an appropriate model. The breaker was replaced, and CH-4B was declared operable on March 8, 1994 at 1841.

CH-4B is considered to have been effectively inoperable from the time that a model THEF136M1050 breaker was first installed (possibly since initial plant construction), because that model of breaker could not be adjusted to obtain the instantaneous trip setting recommended for the CH-4B motor. As a result, the actual breaker trip setting was lower than recommended, which was conservative with respect to protection of the pump motor cable, but not appropriate for ensuring reliable starting of CH-4B.

Investigation of the maintenance history of the redundant pump (CH-4A) identified at least one occasion during which CH-4A was inoperable for greater than 24 hours while the plant was in Mode 1 (i.e., from 0828 on August 19, 1993 to 0845 on August 20, 1993). Because CH-4B is now considered to have been inoperable at that time, it has been concluded that equipment was inoperable for a period of time longer than allowed by TS 2.2(3)b. As a result, this event has been determined to be reportable pursuant to 10 CFR 50.73(a)(2)(i)(B).

CONCLUSIONS

The root cause of this event has been determined to be improperly specified hardware. It could not be conclusively determined when the improper breaker was first installed. It is known that a model THEF136M1050 breaker was installed in MCC-4A2-C04 in October 1991. Data gathered from a walkdown conducted sometime between 1973 and 1979 indicates (via reference to breaker trip ranges) that a model THEF136M1050 was also in place at that time. A model THEF136M1050 breaker may have been installed as part of the original plant configuration, based on a finding that original shop drawings for the motor control centers do not contain a full part number, but instead simply specify a THEF 50 breaker.

This breaker has had a history of spurious tripping in the past with the most recent being June 1992. Therefore, lack of attention to detail on the part of those involved with past maintenance activities is considered to have contributed to the failure to have previously identified the improperly sized breaker. Fort Calhoun Station personnel have received various communications stressing the need for attention-to-detail since 1992 when the last breaker replacement occurred. The misapplied breaker was discovered by a system engineer using a questioning attitude. Therefore, no additional corrective actions were recommended for this contributing cause.

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TEXT (If more space is required, use additional copies of NRC Form 368A) (17)

Complete configuration control documentation did not exist prior to 1992 for the molded case circuit breakers in the motor control centers. The documentation which existed at that time consisted of motor control center data sheets which contained partial model numbers for the breakers. In 1992, a walkdown was conducted and configuration controls were established to address documentation of future changes. The lack of complete configuration information prior to 1992 is considered to be a contributing cause since the application error was not easily detectable.

SAFETY ASSESSMENT

For the safety assessment, CH-4B was conservatively assumed to have been inoperable since initial plant start-up. Nevertheless, the improperly sized breaker would not have prevented the Chemical and Volume Control System from performing its intended safety function during either normal or accident conditions, since gravity feed can supply boric acid to the charging pump suction header if boric acid pumps are inoperable. Therefore, although the ability to reliably start CH-4B was affected, the ability of the plant to respond to a design basis accident was not compromised. Additionally, although the breaker size for CH-4B was improper, the pump was available and used with the exception of the times that the nuisance trips occurred.

CORRECTIVE ACTIONS

The following corrective actions have been or will be completed:

1. The model THEF136M1050 breaker (MCC-4A2-C04) was replaced on March 8, 1994 with a General Electric model TEC36050 breaker (currently available replacement for THEF136M2050).
2. The breaker associated with pump CH-4A (i.e., breaker MCC-3C2-D02) was inspected and found to be a properly set model THEF136M2050 breaker. This action was completed on March 10, 1994.
3. An initial review of all Motor Control Center (MCC) starter/motors fed from the safety-related MCCs was conducted to confirm breaker sizing adequacy. This review compared the breaker size/setting and motor horsepower rating to the recommended sizes and ratings published in the General Electric Application Guide provided with the MCCs. This review determined that the existing breakers are adequately sized and properly set. This was completed on March 29, 1994.

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TEXT (If more space is required, use additional copies of NRC Form 306A) (17)

- Engineering Assistance Request EAR 94-044 has been initiated to further evaluate MCC starter units/breakers and document the results. This will ensure that molded case circuit breakers are properly sized for the loads which they supply. This detailed review will be based on specific motor data (e.g., kVA, applicable codes and service factors) for the MCC starters/breakers. This will be completed by June 1, 1994.

PREVIOUS SIMILAR EVENTS

LERs 92-010 and 91-007 discuss events involving discovery of lack of proper breaker/fuse coordination on the 125V DC system and lack of proper coordination of 480V AC breakers.