



Omaha Public Power District
444 South 16th Street Mall
Omaha, Nebraska 68102-2247

May 26, 2000
LIC-00-0051

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

Reference: Docket No. 50-285

SUBJECT: Licensee Event Report 2000-002 Revision 0 for the Fort Calhoun Station

Please find attached Licensee Event Report 2000-002, Revision 0, dated May 26, 2000. This report is being submitted pursuant to 10 CFR 50.73(a)(2)(i)(B). If you have any questions, please contact me.

Sincerely,

S. K. Gambhir
Division Manager
Nuclear Operations

EPM/epm

Attachment

c: E. W. Merschoff, NRC Regional Administrator, Region IV
L. R. Wharton, NRC Project Manager
W. C. Walker, NRC Senior Resident Inspector
INPO Records Center
Winston and Strawn

LICENSEE EVENT REPORT (LER)

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

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), 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. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

FACILITY NAME (1) Fort Calhoun Nuclear Station Unit Number 1	DOCKET NUMBER (2) 05000285	PAGE (3) 1 OF 4
--	--------------------------------------	---------------------------

TITLE (4)
Inoperability of Auxiliary Feedwater Pump Due to Speed Oscillations During Testing

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 NAME	DOCKET NUMBER
04	28	2000	2000	-- 002	-- 00	05	26	2000		05000
										05000

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
	20.2201(b)		20.2203(a)(2)(v)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)			
POWER LEVEL (10) 100	20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)			
	20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71			
	20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)		OTHER			
	20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)					Specify in Abstract below or in NRC Form 366A
	20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)					

LICENSEE CONTACT FOR THIS LER (12)	
NAME Russell M. Cusick System Engineer	TELEPHONE NUMBER (Include Area Code) 402-533-6531

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)									
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR
X	YES (If yes, complete EXPECTED SUBMISSION DATE).		NO			08	15	2000

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

During the performance of quarterly surveillance testing of the steam turbine driven auxiliary feedwater (AFW) pump (FW-10) on April 26, 2000, per surveillance test procedure SE-ST-AFW-3006, "Auxiliary Feedwater Pump FW-10, Steam Isolation Valve, and Check Valve Tests," FW-10's speed was found to be oscillating. Preliminary evaluation of FW-10 speed oscillation determined that FW-10 may not have been capable of delivering continuous rated flow to the steam generators and was most likely inoperable for greater than the technical specification allowed outage time.

The speed oscillations of FW-10 were determined to be caused by the needle valve on the derivative relay associated with FW-10 speed control circuit being set at 0.75 minutes instead of 0.15 minutes as required by the calibration procedure. Subsequent evaluation of the improper setting of the derivative relay needle valve revealed that the needle valve may have been improperly positioned as early as March 30, 2000.

The derivative relay needle valve setting was returned to 0.15 minutes. FW-10 operability was confirmed by successfully completing the monthly and quarterly surveillance tests. These actions were completed on April 27, 2000.

An analysis is being conducted to determine the performance capability of FW-10 with a derivative relay needle valve setting of 0.75 minutes and the impact of this on the plant.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Fort Calhoun Nuclear Station Unit Number 1	05000285	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 4
		2000	-- 002	-- 00	

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

BACKGROUND

Fort Calhoun Station (FCS) Technical Specification (TS) section 2.5 reads, in part, as follows:

"The reactor coolant shall not be heated above 300 degrees Fahrenheit (F) unless the following conditions are met:

(1) The motor driven auxiliary feedwater pump is operable. The reactor shall not be made critical unless the steam driven auxiliary feedwater pump is operable. During modes 1 and 2, one auxiliary feedwater pump may be inoperable for up to 24 hours, provided that the redundant component shall be tested to demonstrate operability."

Auxiliary feedwater (AFW) pump FW-10 is one of two safety related AFW pumps at FCS. FW-10 was manufactured by Coffin Turbo Pump, Inc. and is a steam turbine driven pump designed to be independent of alternating current (AC) power requirements. FW-6 is the other safety related AFW pump. It is driven by an electric motor supplied from one of the station's 4160 volt AC vital buses.

The speed (and resultant discharge pressure) of FW-10 is controlled by a pneumatic-hydraulic speed control circuit which maintains the AFW pump discharge pressure at a fixed differential greater than its steam inlet pressure. This control system is fed from the non-safety related instrument air (IA) system.

In 1990, a commercial grade, non-safety related, diesel driven AFW pump (FW-54) was added to the feedwater system. This pump's normal injection path is through the main feedwater system, which is independent of the AFW system. Its water supply is the condensate storage tank. FW-54 can be cross-connected to the AFW system injection header. FW-54 is now used as the normal source of water to the steam generators (SG) during low power operation of the plant, i.e., during plant startups and shutdowns. Prior to the installation of FW-54, FW-6 was used during low power operation of the plant.

EVENT DESCRIPTION

FW-10 was declared inoperable at 1009 Central Daylight Time (CDT) on April 26, 2000, as directed by surveillance test procedure SE-ST-AFW-3006, "Auxiliary Feedwater Pump FW-10, Steam Isolation Valve, and Check Valve Tests," as FW-10 was considered to be unable to perform its design function during portions of the surveillance test. With FW-10 declared inoperable, a 24-hour limiting condition for operation (LCO) was entered per TS 2.5. At 1100 CDT, during the performance of procedure step 7.42, the pump speed began oscillating approximately 450 rpm. The system engineer observing the test performance requested termination of the surveillance test and the return of the system to the pre-test configuration until troubleshooting activities could identify the cause of the oscillations.

A work order was initiated and released at approximately 1600 CDT to troubleshoot the speed control circuit. During troubleshooting, the derivative relay (YC-1039-1) needle valve setting was found to be set at 0.75 minutes instead of the proper setting of 0.15 minutes. A review of maintenance and surveillance activities for FW-10 showed the derivative relay (YC-1039-1) needle valve setting was set at 0.15 minutes and independently verified during the 1999 refueling outage. All FW-10 surveillance activities subsequent to the refueling outage were completed with satisfactory results until the pump oscillations were observed on April 26, 2000. Troubleshooting activities did not reveal any other problems with FW-10. YC-1039-1 needle valve was reset to the correct position (0.15 minutes).

Upon completion of the troubleshooting, FW-10 was run using the monthly surveillance test procedure OP-ST-AFW-0004, "Auxiliary Feedwater Pump FW-10 Operability Test." All indications were satisfactory and the test was recorded as complete at 2157 CDT, April 26, 2000. A partial performance of SE-ST-AFW-3006 was performed to confirm operability and to complete the quarterly surveillance test performance requirement. FW-10 was declared operable at 0246 CDT on April 27, 2000.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Fort Calhoun Nuclear Station Unit Number 1	05000285	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 OF 4
		2000	-- 002	-- 00	

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

The YC-1039-1 needle valve is covered by a cap that protects the needle valve. The last recorded time that the needle valve had been adjusted was during the 1999 refueling outage (November 1999). The set point was set and independently verified during the 1999 refueling outage. Following the refueling outage, the quarterly surveillance test (SE-ST-AFW-3006) had been successfully performed on two separate occasions.

Additional investigation continued on the cause of the FW-10 problem. On April 28, 2000, it was determined that the YC-1039-1 needle valve setting had most probably been moved sometime prior to the 24-hour period before the quarterly surveillance test. Since the pump was found in an inoperable condition, it was determined that the pump had been inoperable longer than the allowed outage time. This report is being made pursuant to 10 CFR 50.73(a)(2)(i)(B).

SAFETY SIGNIFICANCE

FW-10 provides a means of supplying the SGs with feedwater. Operation of the pump is automatically initiated on receipt of an auxiliary feedwater actuation signal (AFAS). The pump can also be manually started. FW-10 is designed to deliver flow to the SGs with the loss of all alternating current (AC) power, with unavailability of the main feedwater system, and/or with failure of the main steam piping downstream of the main steam isolation valves.

The plant is designed for shutdown and decay heat removal for a time in excess of 4 hours in the absence of all AC power. Four hours is the duration of time FCS has been analyzed to cope with a design basis station blackout. The steam turbine driven AFW pump requires no AC power for operation nor do any valves or instrumentation required to introduce water in the SG. Feedwater for the steam turbine driven pump is available from the emergency feedwater storage tank, which can be refilled with additional water if necessary. Decay heat would be removed through the main steam safety valves, which require no power. During a loss of AC power, the differential pressure regulator for FW-10 would eventually stop functioning due to the loss of instrument air, and the pump would then operate at a speed determined by the speed limiting governor.

FW-10 is considered a Maintenance Rule program key component as a significant input to the probabilistic risk assessment core damage frequency model. The importance of FW-10 is considered to be greatest when utilized for decay heat removal during station blackout. Other means of removing decay heat during accidents and transients include main feedwater, FW-6, FW-54, and using feed and bleed of the reactor coolant system. Like FW-10, FW-54 does not require AC power to operate during accidents and transients.

The Omaha Public Power District (OPPD) is performing an analysis of the speed control circuit and pump capability with different YC-1039-1 needle valve settings. Results are not expected until the first part of June 2000. Following the completion of this analysis its impact on the operation of the station will be determined. At this time there is no indication that this condition would have any significant impact on the public.

CONCLUSION

The speed oscillations of FW-10 during the performance of quarterly surveillance testing per SE-ST-AFW-3006 were caused by the YC-1039-1 needle valve setting at 0.75 minutes instead of the calibration procedure setting of 0.15 minutes. Subsequent evaluation of the improper setting of YC-1039-1 revealed that the needle valve may have been improperly adjusted as early as March 30, 2000, when FW-10 response during the performance of monthly surveillance test OP-ST-AFW-0004, "Auxiliary Feedwater Pump FW-10 Operability Test," was observed by a technician to be slower than normal in transitioning from the pump speed limiting governor to the pump speed control circuit. During a test of FW-10 performed on March 29, 2000, the system engineer and a technician observed that the pump was operating normally at that time. No documentation could be found that authorized or affected the adjustment of YC-1039-1 setting subsequent to the 1999 refueling outage. The set point was set and independently verified during the 1999 RFO.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Fort Calhoun Nuclear Station Unit Number 1	05000285	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 4
		2000	-- 002	-- 00	

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

CORRECTIVE ACTIONS

YC-1039-1 needle valve setting was returned to 0.15 minutes. FW-10 operability was confirmed by successfully completing the monthly and quarterly surveillance tests. These actions were completed on April 27, 2000.

An analysis is being conducted to determine the performance capability of FW-10 with its speed control circuit operating with a derivative relay needle valve setting of 0.75 minutes and the impact of this on the plant. This analysis will be completed to support a revision to this LER to be submitted to the NRC by August 15, 2000.

SAFETY SYSTEM FUNCTIONAL FAILURE

This event did not result in a safety system functional failure in accordance with NEI 99-02, revision 0.

PREVIOUS SIMILAR EVENTS

There have not been any previous instances of FW-10's YC-1039-1 needle valve being incorrectly set.