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April 17, 1997

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Subject: Catawba Nuclear Station
Docket No. 50-414
LER 414/97-003

Gentlemen:

Attached is Licensee Event Report 414/97-003 concerning **Component Cooling System Unavailability.**

This event is considered to be of no significance with respect to the health and safety of the public.

Cordially,

W.R. McCollum, Jr.

Attachment

cc: Mr. L. A. Reyes
Administrator, Region II
U.S. Nuclear Regulatory Commission
101 Marietta St., NW, Suite 2900
Atianta, GA 30323

INPO Records Center
700 Galleria Place
Atlanta, GA 30339-5957

Mr. T. S. Tam
U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D.C. 20555

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NRC Resident Inspector
Catawba Nuclear Station

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NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMD NO. 3150-0104
EXPIRES: 04/30/98
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.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Catawba Nuclear Station	05000414	1 of 5

TITLE (4)
Component Cooling System Unavailability

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(S)
												N/A	
02	17	97	97	-	003	-	00		04	19	97		

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (Check one or more of the following) (11)					
POWER LEVEL (10)	100	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 (Specify in		
		20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	Abstract below and		
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	in Text, NRC Form		
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	366A)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER	
	AREA CODE	
D. P. Kimball, Safety Review Group Manager	(803)	831-3743

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	
F	CC	52	G182	Y							

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

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

Unit Status: Unit 2- mode 1, power operation, 100% power.

Event Description: On 03/20/97 Engineering determined that between 01/25/97 and 02/17/97, the 2A1 KC pump would not have restarted by automatic sequencer action during an event requiring it to be load shed from the essential bus. After losing power, the 2A1 KC breaker would not have reclosed when power was restored.

Root Cause: There was a failure of the breaker charging springs motor coils when the breaker was closed on 01/25/97. The breaker and pump remained in operation until 02/16/97 when A train KC was secured for testing. The charging motor failure was age related. In 1995, these safety related breakers were incorporated into a new periodic refurbishment program that includes an inspection of the breaker closing springs motor, but the 2A1 KC pump breaker had not yet been refurbished.

Corrective Action: Train A of the Unit 2 KC system was declared inoperable and the appropriate Technical Specification action was entered. The failed breaker was replaced with an operable breaker.

BACKGROUND:

The Catawba Component Cooling System (KC) [EIIS:CC] acts as a closed loop treated water system to dissipate waste heat from motor [EIIS:MO] coolers [EIIS:CLR] and intersystem heat [EIIS:S] exchangers [EIIS:HX] serving various systems supporting plant startup, normal, and shutdown activities. The KC System also provides cooling to engineered safeguard loads after a Design Basis Event (DBE). The KC system is cooled by the Nuclear Service Water System (RN) [EIIS:BI], and the KC essential header is flow balanced to prevent pump runout and ensure adequate flow to essential header components.

The KC system has two redundant trains with two pumps [EIIS:P] per train that receive power from the 4160 volt (v) essential switchgear. If a blackout occurs on either or both 4160v essential switchgears, the train-related sequencer will shed all loads on the affected switchgear. The sequencer will then ensure power is available to that switchgear and will restore the necessary loads on that switchgear. This action cycles the breaker for an operating KC pump motor from closed to open to closed.

The operation of the metal clad circuit breakers is such that the closing springs charge any time the breaker is cycled closed. The closing operation uses energy stored in the closing springs. Once the breaker is closed, internal limit switches immediately begin the recharge operation. When the springs are fully charged sufficient stored energy remains to allow the breaker to be tripped open (springs remain charged), closed (springs discharged), and tripped open again. This would expend all stored energy.

PT/2/A/4400/03A, Component Cooling Train 2A Performance Test, is a routine quarterly technical specification surveillance test. During the test the A train KC pumps are started from the control room to ensure their operability.

Technical Specification 3.7.3, Component Cooling Water System, Action requires "With only one component cooling water loop operable, restore at least two loops to operable status within 72 hours or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours."

EVENT DESCRIPTION:

01/25/97 0300 The 2A KC Train was placed in service.

02/16/97 2102 The operation the of KC pumps was swapped from Train A to Train B to prepare for conducting A Train testing per PT/2/A/4400/03A.

02/17/97 1032 While performing PT/2/A/4400/03A, the 2A1 KC pump failed to start and was declared inoperable.

~1500 I&E determined that the closing springs for the 2A1 KC pump motor breaker were not fully charged.

~1700 The failed breaker was replaced with a spare breaker.

1850 A functional verification was completed on the new breaker for 2A1 KC pump motor. The breaker operated satisfactorily.

All 4160v safety related switchgear breakers for Units 1 and 2 were inspected to ensure the closing springs were fully charged.

2155 The 2A KC Train was declared operable.

03/20/97 Engineering determined that between 01/25/97 and 02/17/97, the 2A1 KC pump would not have restarted by automatic sequencer action during an event requiring it to be load shed from the essential bus. After losing power, the 2A1 KC pump breaker would not have reclosed when power was restored.

CONCLUSIONS:

The root cause of this event was a failure of the breaker springs charging motor during breaker closure on 01/25/97. When the breaker was opened for train realignment on 2/16/97, the closing springs did not contain sufficient energy to reclose during testing, rendering the breaker inoperable. An investigation found the failure of the coils in the charging springs motor was age related.

Prior to 1995, these safety related breakers were refurbished on an as-need basis. In 1995, these safety related breakers were incorporated into a new periodic refurbishment program that includes inspection of the breaker spring charging motor. The failed breaker had not yet been refurbished under the enhanced program. All 4160v safety related breakers are scheduled to be refurbished by the end of Unit 2 EOC9 refueling outage under this program. This includes both units.

Failure of the breaker is NPRDS reportable.

A review of the Operating Experience Database (OEDB) for the past 24 months revealed no reportable events involving breaker failure. Therefore, this is not a recurring event.

CORRECTIVE ACTIONS:

SUBSEQUENT:

1) The failed breaker was replaced with a spare breaker that had been refurbished, tested, and declared operable.

2) PT/2/A/4400/03A was successfully performed.

3) All 4160v safety related switchgear breakers for Units 1 and 2 were inspected to ensure their closing springs were fully charged. The inspection found all other springs fully charged.

PLANNED:

None

SAFETY ANALYSIS:

The 2A1 KC pump would not have operated during DBEs which required 4160v essential bus load shed and subsequent reloading from 0300 on 01/25/97 until 1850 on 02/17/97 when the breaker was replaced. During this time RN temperatures were well below the 91.5 degrees F maximum design temperature. This would have resulted in a much lower required KC flow rate through the essential header components due to maximum RN flow to the KC Hx during a DBE.

A flow and heat transfer analysis was performed to ensure that adequate KC flows and heat transfer would have been provided during a DBE with only the 2A2 KC pump available. It was determined that with one pump operating the adjusted (reduced) KC flow to all essential headers components was above the minimum test acceptance criteria except for KC flow to the ND Hx. Therefore, the heat removal function of KC for these components (except the ND Hx) is adequate with only the 2A2 KC pump operating during a DBE.

Since KC flow to the ND Hx was below the minimum test acceptance criteria, a heat transfer analysis was performed to determine if the reduced KC flow rate was acceptable. The highest temperature for RN, used to cool KC, during the time frame was 50.9 degrees F. The analysis determined that heat transfer with one pump operating would have met the requirements of a DBE.

Under accident conditions non-essential headers will be isolated. With this condition, system resistance will not allow pump runout with only one pump in operation. When accident conditions do not exist and all headers may be aligned, there are administrative controls to prevent runout of the pumps.

The KC system and the systems and components it serves, would have been able to perform their safety functions during the time when 2A1 KC pump closing springs were not fully charged.

The health and safety of the public were not affected by this event.