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May 23, 1989

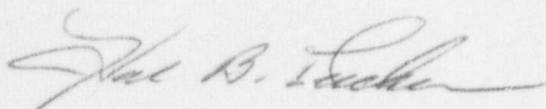
Document Control Desk  
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Washington, D. C. 20555

Subject: Catawba Nuclear Station, Unit 2  
Docket No. 50-414  
LER 414/87-13, Revision 1

Gentlemen:

Pursuant to 10 CFR 50.73 Section (a) (1) and (d), attached is Revision 1 to Licensee Event Report 414/87-13 concerning an Auxiliary Feedwater Auto-Start on Loss of both Main Feedwater Pumps due to an equipment failure. This event was considered to be of no significance with respect to the health and safety of the public.

Very truly yours,



Hal B. Tucker

JGT/28/R/lcs

Attachment

xc: Mr. S. D. Ebnetter  
Regional Administrator, Region II  
U. S. Nuclear Regulatory Commission  
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Atlanta, Georgia 30339

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Mr. W. T. Orders  
NRC Resident Inspector  
Catawba Nuclear Station

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**LICENSEE EVENT REPORT (LER)**

FACILITY NAME (1) Catawba Nuclear Station, Unit 2										DOCKET NUMBER (2) 0 5 0 0 0 4 1 4 1 OF 0 4										PAGE (3) 1		
TITLE (4) Auxiliary Feedwater Auto-Start On Loss of Both Main Feedwater Pumps Due to Equipment Failure																						
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 NAMES					DOCKET NUMBER(S)								
									N/A					0 5 0 0 0								
0 3 2 5 8 7 8 7									0 1 3 0 1 0 5 2 3 8 9									0 5 0 0 0				
OPERATING MODE (9) 3			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5 (Check one or more of the following) (11)																			
POWER LEVEL (10) 0 0 0			20.402(b)			20.406(e)			X			50.73(a)(2)(iv)			73.71(b)							
			20.406(a)(1)(i)			50.36(a)(1)						50.73(a)(2)(v)			73.71(a)							
			20.406(a)(1)(ii)			50.36(a)(2)						50.73(a)(2)(vii)			X OTHER (Specify in Abstract below and in Text, NRC Form 360A)							
			20.406(a)(1)(iii)			50.73(a)(2)(i)						50.73(a)(2)(viii)(A)			50.72(b)(2)(iii)							
			20.406(a)(1)(iv)			50.73(a)(2)(ii)						50.73(a)(2)(viii)(B)										
			20.406(a)(1)(v)			50.73(a)(2)(iii)						50.73(a)(2)(ix)										
LICENSEE CONTACT FOR THIS LER (12)																						
NAME Julio G. Torres, Associate Engineer										TELEPHONE NUMBER 7 10 4 3 17 13 1-18 0 12 19												
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													
X	S/D	1 1 X C M	4 3 0	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)

On March 25, 1987, at 1013:50 hours, with Unit 2 in Mode 3, Hot Standby, the Motor Driven Auxiliary Feedwater (CA) Pumps automatically started due to loss of both Main Feedwater (CF) Pumps. CF Pump 2A was isolated for maintenance. CF Pump 2B tripped on low suction pressure when all Condensate Booster Pumps (CBPs) tripped due to a condensate transient. The cause of the condensate transient was determined to be the unexpected closure of the Condensate Polishing Demineralizer Bypass Control Valve, reducing condensate flow and causing high polisher header differential pressure.

During the review of LER 414/87-21 in which the Condensate Polisher Bypass valves again closed under high Differential Pressure (D/P) conditions, it was discovered that a calibration error of the Barton 273A D/P transmitters allowed the transmitter to send a low D/P signal to the polisher bypass valves when actual D/P was overranged high. A change in the calibration procedure was required to correct the situation. Therefore, a defective procedure contributed to this event. The initial cause for the high D/P has not been determined.

Control Room personnel reopened the polisher bypass valve, restarted CF Pump 2B, and secured the Motor Driven CA pumps. The valve controller was replaced following the incident. Adequate core heat removal capability was available at all times. The health and safety of the public were unaffected by this incident.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED ONS NO 3150-0104  
EXPIRES 8/31/95

FACILITY NAME (1)  Catawba Nuclear Station, Unit 2	DOCKET NUMBER (2)  05000411487	LER NUMBER (3)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		87	013	01	02	OF	04

TEXT (If more space is required, use additional NRC Form 306A (1/77))

BACKGROUND

The Condensate System (EIIS:SD) (CM) takes condensed steam from the Main Condenser (EIIS:COND) Hotwell, cleans it, heats it to improve cycle efficiency, and delivers it to the Feedwater System (EIIS:SJ) (CF). This system contains three 50% capacity Condensate Booster Pumps (EIIS:P) (CBPs) which aid the Condensate Hotwell Pumps (EIIS:P) in providing the total suction header requirements of the CF Pumps. This system also contains five Condensate Polishing Demineralizers (EIIS:DM) to remove dissolved and suspended solids from condensate flow. Condensate Polisher Bypass Control Valves (EIIS:V) 2CM42 and 2CM186 open when the influent to effluent header differential pressure (D/P) is high, to bypass condensate flow around the polishers. These valves are controlled by valve controller (EIIS:XL) 2CMSS6170.

The CF System receives the condensate from the CM System and supplies it as feedwater to the four Steam Generators (EIIS:SG) (S/Gs) at the temperature, pressure, and flow required to maintain proper S/G water levels commensurate with Reactor (EIIS:RCT) power output and Turbine (EIIS:TRB) steam requirements. This system contains two Main Feedwater Pumps (EIIS:P) to supply the feedwater to the S/Gs. These pumps will trip on loss of condensate suction pressure.

The Auxiliary Feedwater System (EIIS:BA) (CA) assures sufficient feedwater supply to the S/Gs in the event of loss of the CM/CF Systems, to remove stored and residual core energy in the primary coolant. The Motor Driven CA Pumps are designed to start automatically in the event of trip of both CF Pumps.

DESCRIPTION OF INCIDENT:

On March 25, 1987, Unit 2 was in Mode 3, Hot Standby, after having been shutdown to repair excessive Reactor Coolant (EIIS:AB) (NC) leakage (see LER 414/87-10). At 1012:46:895 hours, the Control Room received the CBP low suction header pressure alarm. At 1013:15:829 hours, the CBP emergency low suction header pressure alarm was received. At 1013:16:861 hours, the CF Pump low suction header pressure alarm was received. Upon investigating the reason for the alarms, a Nuclear Control Operator (NCO) discovered that valve 2CM186 was fully closed and that indicator 2CMP6170, Condensate Polishing Demineralizer D/P, was pegged high. At 1013:17 hours, with CBP 2A running, CBP 2B automatically started due to low condensate flow. At 1013:31 hours, CBPs 2A and 2B tripped on low suction header pressure. At 1013:49:509 hours, CF Pump 2B tripped on emergency low suction pressure. CF Pump 2A was isolated for maintenance. At 1013:50 hours, Motor Driven CA Pumps 2A and 2B automatically started due to loss of both CF Pumps.

The NCO manually reopened valve 2CM186 and then placed its controller in AUTO. The valve functioned properly. At 1019:51 hours, Control Room personnel started CBP 2C. At 1020:09 hours, CF Pump 2B was restarted. At 1136:15 hours, Motor Driven CA Pump 2A was secured and at 1136:16 hours, Motor Driven CA Pump 2B was also secured.



## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104  
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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Catawba Nuclear Station, Unit 2	0500041487	-01	03	-01	03	OF 04

TEXT (If more space is required, use additional NRC Form 3086's (17)

During the performance of a Secondary Side Transient test on February 20, 1988, Performance personnel determined that the 2CMPT6170, Condensate Polisher DP Transmitter, failed to zero output when overranged high. A subsequent investigation revealed that improper set up of the overrange stop bar allowed this situation to occur. A procedure deficiency for the Barton 273A transmitter was then noted because the procedure did not reference the setup of the overrange stop bar.

## CONCLUSION:

Valve 2CM186 closed causing reduced condensate flow and high polisher header D/P, resulting in a condensate transient. The condensate transient resulted in the loss of the CBPs which resulted in the loss of CF Pump 2B due to low suction pressure. With CF Pump 2A isolated for maintenance, the Motor Driven CA Pumps automatically started due to loss of both CF Pumps. Control Room personnel manually opened valve 2CM186 and then placed its controller in AUTO. The valve functioned properly. Control Room personnel restarted CF Pump 2B and secured the Motor Driven CA Pumps.

A review of work in progress at the time of the event did not reveal any activities with the polishers that could have caused valve 2CM186 to close and result in the condensate transient. Discussion with Duke Power Station personnel indicated that there have been several problems with the valve controller (2CMSS6170) for 2CM42 and 2CM186. Some of the problems encountered have been condensate transients when going from MANUAL to AUTO, and the controller drifting out of calibration. Therefore, it is suspected that valve 2CM186 closed due to a malfunction of its controller. The controller was subsequently replaced.

During the review on LER 414/87-21 in which the Condensate Polisher Bypass valves again closed under high D/P conditions, it was discovered that a calibration error of the Barton 273A D/P transmitters allowed the transmitter to send a low D/P signal to the polisher bypass valves when actual D/P was overranged high. A change for the calibration procedure was required to correct the situation. Therefore, a defective procedure contributed to this event.

During review of the alarm typer, the Closed/Not Closed computer point (D1889) for valve 2CM186 was discovered to not function when the valve was closed and opened. Work Request 7794 IAE was initiated to investigate and repair this problem.

An NPRDS search revealed no demand signal failures of Moore Products Model 528SM-2 valve controllers. This failure is NPRDS reportable.

There have been five previous incidents of Instrumentation and Electrical (IAE) procedural deficiencies which resulted in a Reactor trip. None of these incidents involved the calibration of Barton 273A transmitters. Therefore, the corrective actions for these incidents could not have prevented this incident. This is not a recurring event.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3150-0104

EXPIRES 8/31 96

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
		01	3	01	04	OF 04

TEXT IF MORE SPACE IS REQUIRED, USE ADDITIONAL (NRC Form 255a) (17)

## CORRECTIVE ACTION:

## SUBSEQUENT

- (1) Control Room Operator reopened the polisher bypass valve, started CBP 2C, restarted CF Pump 2B and secured the Motor Driven CA Pumps.
- (2) Valve controller 2CMSS6170 was replaced.
- (3) IAE personnel determined that the overrange stop bar was not set up properly on 2CMPT6170 and corrected the calibration error.
- (4) The generic procedure for Barton 273A transmitters has been revised to include instructions for the over range stop bar adjustment. All Barton 273A transmitters at CNS have been identified and applicable calibration procedures have been or are being revised to instruct personnel to adjust the over range stop bar per the generic procedure whenever a Barton 273A transmitter is being calibrated.

## SAFETY ANALYSIS:

During this incident, S/G levels remained within acceptable limits. Since the unit was in Hot Standby at the time of the incident, the transient caused by the loss of the Condensate/Feedwater System was minimal. The Motor Driven CA Pumps were in operation throughout the incident, providing feedflow to the S/Gs. Therefore, adequate core heat removal capability was available at all times.

The health and safety of the public were unaffected by this incident.