

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)
Catawba Nuclear Station, Unit 2

DOCKET NUMBER (2)
0 5 0 0 0 4 1 4

PAGE (3)
1 OF 0 5

TITLE (4)
Containment Air Return Fan Start Possibly Due to Inadequate Policy Involving the Control of Sliding Links

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)													
0	3	0	8	9	0	0	7	0	0	0	4	2	4	8	9	None	0	5	0	0	0		

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 8: (Check one or more of the following) (11)

OPERATING MODE (9) 5	20.402(b)	20.406(a)	80.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10) 0 0 0	20.406(a)(1)(i)	80.36(a)(1)	80.73(a)(2)(v)	73.71(c)
	20.406(a)(1)(ii)	80.36(a)(2)	80.73(a)(2)(vii)	<input checked="" type="checkbox"/> OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.406(a)(1)(iii)	80.73(a)(2)(i)	80.73(a)(2)(viii)(A)	Courtesy LER
	20.406(a)(1)(iv)	80.73(a)(2)(ii)	80.73(a)(2)(viii)(B)	
	20.406(a)(1)(v)	80.73(a)(2)(iii)	80.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME: R.M. Glover, Compliance Engineer

TELEPHONE NUMBER: 8 0 3 8 3 1 - 3 2 3 6

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15)
0 8 0 1 8 9

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

On March 16, 1989, at 0433 hours, Unit 2 Containment Air Return Fan 2A, CARF-2A, started in response to a Containment Pressure Control System (CPCS) permissive for high Containment pressure. At the time of the incident, Containment pressure was increasing due to Operations personnel preparing for the Containment Integrated Leak Rate Test (ILRT). However, the high-high Containment pressure (S_p) setpoint, which is also needed to start the fan, should not have been actuated. Three days prior to the incident, a calibration was performed on a timer in the CARF-2A control circuitry. It is believed that, during this calibration, the timer was not properly isolated by use of sliding links which subsequently caused an S_p signal to be unknowingly sealed-in in the CARF-2A circuitry. This incident has been attributed to a possible inadequate policy involving control of sliding links. Sliding links were not previously required to be secured in the OPEN position. If the isolation sliding link unknowingly reclosed during the calibration, the circuit seal-in would have occurred. Unit 2 was in Mode 5, Cold Shutdown, when the seal-in and the fan start occurred. An improved method of proper isolation using sliding links will be evaluated.

This report is provided as a Courtesy LER.

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TEXT (If more space is required, use additional NRC Form 364A's) (17)

BACKGROUND

The purpose of the Containment Air Return [EIIS:BK] Subsystem of the Containment Air Return and Hydrogen Skimmer [EIIS:BB] (VX) System is to assure rapid return of air from upper to lower Containment [EIIS:NH] after an initial large break LOCA blowdown. The subsystem consists of two redundant independent and separately located 100% capacity fans [EIIS:FAN] per Unit. The fans are designed to start 9 minutes after the high-high pressure (Sp) setpoint (3 psig) is reached.

The Containment Air Return Fan Damper [EIIS:DMP] 2A, 2ARF-D-2, is designed to open after a 10 second delay upon an Sp Signal. When this damper is open, a flow path is provided for the air return fan from upper to lower Containment.

Technical Specification 3.6.5.6 requires that two independent VX Trains be operable in Modes 1, Power Operation, 2, Startup, 3, Hot Standby, and 4, Hot Shutdown. With one train inoperable greater than 72 hours, the plant must be in at least Hot Standby within the next 6 hours, and in Cold Shutdown within the following 30 hours. With both trains inoperable, Technical Specification 3.0.3 requires that action shall be initiated within 1 hour, to place the Unit in a mode in which the Technical Specification does not apply. The Unit is to reach Mode 3 within the next 6 hours, Mode 4 within the following 6 hours, and Mode 5, Cold Shutdown, within the subsequent 24 hours.

EVENT DESCRIPTION

On February 28, 1989, while Unit 2 was in Mode 1, PT/2/A/4450/05A, Containment Air Return Fan 2A and Hydrogen Skimmer Fan 2A Performance Test, was completed. On March 10, 1989, the Train A Containment Pressure Control System (CPCS) Arrog Channel Operational Test was performed per Work Request 5985 SWR. At 2201 hours, on March 11, 1989, Unit 2 entered Mode 5 in preparation for a Refueling Outage. Timer [EIIS:RLY] calibration on 2VXTD1(CB), under Work Request 10034 SWR, was completed on March 13, 1989.

On March 15, 1989, Operations personnel began preparation for the Containment Integrated Leak Rate Test (ILRT). While pressure was increasing in Containment on March 16, 1989, at 0433:34 hours, CARF-2A started in response to a CPCS permissive due to Containment pressure reaching the setpoint of 0.35 psig. At 0619:51 hours, a Control Room Operator (CRO) observed CARF-2A running and secured the fan by placing the VX Fan Switch, VX1 [EIIS:XIS], to the OFF position and then back to AUTO.

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TEXT (if more space is required, use additional NRC Form 305A's) (17)

CONCLUSION

This incident has been attributed to a possible inadequate policy involving control of sliding links. The CARF-2A started on a CPCS signal. However, the other permissive needed to start the fan, an Sp Signal, was not actuated. It is speculated that an Sp Signal was sealed into the circuit during the timer calibration performed on March 13, 1989. Three days prior to the incident, a timer (2VXTD1(CB)) in the VX circuitry was calibrated under Work Request 10034 SWR. When an Sp signal is received 2VXTD1(CB) is energized. In approximately 9 minutes, it will time out, closing contacts 1 and 3, in the VX circuitry. Once these contacts are closed, the Sp Signal is sealed into the circuitry. This signal can be manually removed by placing the VX Fan switch to the OFF position. The switch is normally maintained in the AUTO position. During the calibration, IP/2/A/3173/05, Containment Air Return and Hydrogen Skimmer System (VX), was used. This calibration procedure specifies an isolation, by opening a sliding link, F-14 in 2EATC4, to ensure a seal-in will not occur. However, if the sliding link is not completely open, a seal-in could unknowingly occur during calibration. Six days prior to the incident, Work Request 5985 SWR was completed. Under this work request, a Train A CPCS Analog Channel Operational Test was performed. If a seal-in was present in the VX circuitry at this time, CARF-2A would have started during this calibration. A thorough review was completed on work and testing performed between the time of the CPCS calibration and the fan start and it is speculated that the seal-in occurred while calibrating the timer. All evidence points to the sliding link not being completely open or unknowingly closing while performing the timer calibration. Due to the incident, the method of proper isolation using sliding links is being evaluated. Sliding links were not previously required to be secured in the OPEN position. The results of this evaluation will be incorporated into Station Procedures as required. Also, the timer calibration procedure, IP/1,2/A/3173/05, will be revised to ensure a seal-in cannot occur during calibration. It should also be noted that the timer calibration is performed during outages and this CPCS calibration is performed monthly. Therefore, a seal-in would be detected within thirty days and prior to the end of an outage.

As stated in the background, 2ARF-D-2, Containment Air Return Fan 2A Damper, is designed to open after a 10 second time delay following Sp actuation. During this incident, an actual Sp was not received, therefore, the damper did not open. This resulted in dead head operation of CARF-2A. Evaluation of the effects of this dead head operation on the fan and damper will be completed prior to Unit restart following 2EOC2 Refueling Outage. Also, the potential effects of immediately energizing CARF-2A following a LOCA or Blackout condition will be evaluated prior to Unit restart following EOC2 Refueling Outage.

During the past 12 months, there has been one other Engineered Safety Features Actuation due to an inadequate policy (see LER 414/89-03). The corrective action for this incident, however, applied to independent verification for jumper installation during troubleshooting activities and therefore would not have prevented this incident. Therefore, this incident is not classified as a recurring event.

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TEXT (if more space is required, use additional NRC Form 206A's) (17)

There was a previous problem on the Unit 2 VX System discovered in early 1987 involving two wires [EIIS:CON] which were apparently swapped during the installation of a modification (see LER 414/88-033). PT/2/A/4450/05A was used as a post modification test. This test did not discover the swapped wires. However, the test did conservatively challenge the portion of the Air Return Fan control circuit affected by the modification. Also, after the incident, an inspection was performed on the wires to identify any other problems which might be present, and none were discovered. There is no reason to believe any other problems exist in the circuitry. It should also be noted that the previous incident and this incident are unrelated.

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CORRECTIVE ACTION

SUBSEQUENT

- 1) Control Room Operator secured CARF-2A.
- 2) Timer calibration was reperformed, using IP/2/A/3173/05, to ensure a problem did not exist with the method used during calibration.

PLANNED

- 1) An improved method of proper isolation using sliding links will be evaluated.
- 2) IP/1,2/A/3173/05 will be revised to ensure a seal-in cannot occur during calibration.
- 3) Effects of the dead head operation on the fan (CARF-2A) and damper (2ARF-D-2) will be evaluated.
- 4) Potential effects of immediately energizing CARF-2A following a LOCA or Blackout condition will be evaluated.
- 5) This report will be revised based on the results of Planned Corrective Action numbers 3 and 4.

SAFETY ANALYSIS

Unit 2 was in Mode 5 when both the Sp seal-in and the fan start occurred. The VX System was not required to be operable at that time. However, the following analysis is being provided to address the incident had it occurred during Mode 1 and the time delay had been bypassed when a LOCA occurred. If the 9 minute delay for start of the air return fans is defeated, cooler temperatures and lower than normal pressures would exist within Containment compared to a transient analyzed without air return flow. This would serve to mitigate most

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TEXT (If more space is required, use additional NRC Form 3054's) (17)

of the transients in the FSAR (peak pressure, peak temperature, divider barrier reverse differential pressure, and subcompartment wall differential pressure), but would exacerbate the ECCS backpressure (minimum pressure) analysis. The BASH (a post LOCA modeling program) code is not particularly sensitive to variations in Containment pressure; thus, no significant increase in peak clad temperature due to lower Containment pressure is expected. There also exists a good deal of margin between the current calculated peak clad temperature (1740 deg. F) and the design limit of 2200 deg. F.

Therefore, immediate actuation of air return flow does not unacceptably impact the analyses found in the FSAR and does not present a safety concern. The health and safety of the public were not affected by this incident.

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April 21, 1989

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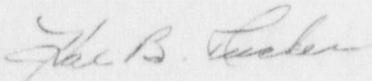
Subject: Catawba Nuclear Station, Unit 2
Docket No. 50-414
LER 414/89-07

Gentlemen:

Pursuant to 10 CFR 50.73 Section (a) (1) and (d), attached is Licensee Event Report 414/89-07 concerning a containment air return fan start due to a possibly inadequate policy involving the control of sliding links.

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/03/U2-7

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