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**DUKE POWER**

November 20, 1990

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

Subject: Catawba Nuclear Station  
Docket No. 50-413  
LER 413/90-30

Gentlemen:

Attached is Licensee Event Report 50-413-90-30, concerning TECHNICAL SPECIFICATION 3.0.3 ENTERED DUE TO TWO OPERABLE TRAINS OF THE CONTROL ROOM AREA VENTILATION SYSTEM DUE TO EQUIPMENT FAILURE AND DEFICIENT PREVENTIVE MAINTENANCE PROGRAM.

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

Very truly yours,

*J W Hampton* ✓  
J. W. Hampton  
Station Manager

ken\LER-NRC.JWH

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Catawba Nuclear Station, Unit 1	DOCKET NUMBER (2) 0 5   0 0   0 4   1 3	PAGE (3) 1 OF 0 6
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TITLE (4)  
Technical Specification 3.0.3 Entered Due to Two Inoperable Trains of the Control Room Area Ventilation System Due to Equipment Failure and Deficient Preventive Maintenance Program

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)																	
1	0	2	3	9	0	9	0	0	0	3	0	0	0	1	1	2	0	9	0	0	CNS, Unit 2	0	5	0	0	0	4	1	4

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)									
POWER LEVEL (10) 1 0 0	20.402(b)	20.405(e)	50.73(a)(2)(ix)	73.71(b)						
	20.406(a)(1)(i)	50.36(e)(1)	50.73(a)(2)(ix)	73.71(e)						
	20.406(a)(1)(ii)	50.36(e)(2)	X 50.73(a)(2)(ix)	OTHER (Specify in Abstract below and in Text, NRC Form 306A)						
	20.406(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)							
	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)(x)							

LICENSEE CONTACT FOR THIS LER (12)										
NAME C. L. Hartzell, Compliance Manager							TELEPHONE NUMBER			
							AREA CODE			
							8 0 3	8 3 1 - 3 6 6 5		

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)										
CAUSE	SYSTEM	COMPONENT	MANUFAC TURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFAC TURER	REPORTABLE TO NPRDS	
X	UICV		I 2   0   6	N						

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input type="checkbox"/> YES (if yes, complete EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO							

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

On October 23, 1990, at 2330 hours, with Unit 1 at 100% power in Mode 1, Power Operation, and Unit 2 at 98% power in Mode 1, "A" Train of the Control Room Area Ventilation (VC) and Chilled Water (YC) Systems was secured to manually align return air damper 1CR-D-9, which failed closed due to a hydromotor actuator malfunction. Efforts to start the VC/YC "B" Train were not successful due to the "B" Train YC Chiller tripping during start attempts. This rendered both trains of VC/YC inoperable; therefore, at 2345 hours, Units 1 and 2 entered Technical Specification (T/S) 3.0.3. Dampers were manually positioned and blocked open to restore operability of the VC/YC "A" Train. VC/YC "A" Train restart was achieved at 0055 hours on October 24, 1990, and T/S 3.0.3 was exited. A high priority work request was written to repair the "B" Train YC chiller. The chiller was repaired and capable of performing its intended function on October 25, 1990. This incident is attributed to equipment failure/malfunction and management deficiency due to a failed hydromotor and an out of calibration oil pressure switch, respectively. A Design Study is being conducted to identify a suitable hydromotor replacement and the Preventive Maintenance Program will be enhanced to include these particular VC/YC chiller oil pressure switches.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

BACKGROUND

The Control Room Area Ventilation [EIIS:UC] (VC) and Chilled Water [EIIS:UE] (YC) Systems combine to form one system which is designed to maintain a suitable environment in the following plant areas at all times: Control Room (C/R), Cable [EIIS:CON] Room, Battery [EIIS:BTRY] Rooms, Switchgear Rooms, Motor [EIIS:MO] Control Center (MCC) Rooms, and the Electrical Penetration [EIIS:PEN] Rooms at elevation 594+0. The VC/YC System is shared between both Units. There are two 100% redundant trains of VC/YC equipment. Each is capable of being powered by Unit 1 or Unit 2 Essential Auxiliary Power, but under normal conditions both trains are aligned to Unit 1. Two Diesel Generators [EIIS:GEN] (D/Gs) are provided per Unit to energize the Essential Auxiliary Power buses during emergency conditions.

Technical Specification (T/S) 3.7.6 specifies that two independent trains of VC/YC shall be operable during all operational modes. If one train becomes inoperable while either Unit is in Mode 4, Hot Shutdown, or above, restore the inoperable system to operable status within seven days or be in at least Hot Standby within the next six hours and in Cold Shutdown within the following 30 hours.

Technical Specification 3.0.3 is required to be entered when the Unit is operating in a condition prohibited by Technical Specifications. This condition exists when a Limiting Condition for Operation is not met except as provided in the associated Action Requirements. It requires that within one hour action shall be initiated to place the Unit in a Mode in which the specification does not apply by placing it, as applicable, in:

- a) At least Hot Standby in the next 6 hours,
- b) At least Hot Shutdown within the following 6 hours, and
- c) At least Cold Shutdown within the subsequent 24 hours.

The Catawba Nuclear Station T/S 3.0.3 interpretation states that the purpose of the one hour is to allow for preparation of an orderly shutdown before initiating a change in plant operation. It further states that if the equipment problem can be resolved within three (3) hours, no load reduction is necessary as this still leaves sufficient time to shutdown in a controlled and orderly manner and well within the specified maximum cooldown rate and within the cooldown capabilities of the facility assuming only the minimum required equipment is operable. The Compliance Duty Engineer (or alternate) is to be appraised of the situation such that he will understand why T/S 3.0.3 was entered and power was not reduced, so the NRC Resident Inspectors can be appraised of the situation. This discussion with the Compliance Duty Engineer is in addition to the normal discussions with the Station Manager/Duty Station Manager.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

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TEXT (If more space is required, use additional NRC Form 386A's) (17)

The term, "action shall be initiated", means as a minimum that the shutdown procedure is reviewed and prepared for use, the dispatcher is contacted to make him aware of the situation, and any other power increase is stopped.

Operations Management Procedure (OMP) 2-29 provides proper damper alignment should a damper require to be manually blocked open or closed. In this event damper 1CR-D-9 was manually blocked in the open position. For this case, OMP 2-29 states:

If 1CR-D-4 or 1CR-D-10 or 1CR-D-9 is blocked open, at least one of 1CR-D-4 or 1CR-D-10 or 1CR-D-9 must be operable to not affect "B" Train.

Dampers in the VC/YC system utilize hydromotors to modulate their appropriate positions. This equipment has experienced numerous failures and action has been initiated to replace hydromotors with totally electric actuators.

EVENT DESCRIPTION

On October 23, 1990, at 2330 hours, with Unit 1 at 100% power in Mode 1, Power Operation, and Unit 2 at 98% power in Mode 1 the "A" Train of Control Room area Ventilation (VC) and Chilled Water (YC) Systems was secured after return air damper 1CR-D-9 failed closed due to a hydromotor actuator malfunction. Due to the close proximity of this damper to the Control Room, the failure was immediately evident to personnel because of the loud noise created when the louvers slammed closed. At 2345 hours, attempts to place the "B" Train of the VC/YC system in service failed due to the chiller unit tripping on initial starts. Since both trains of VC/YC were inoperable, Units 1 and 2 entered Technical Specification (T/S) 3.0.3.

The Duty Maintenance Supervisor was notified to contact the HVAC vendor to reposition the damper as necessary to allow a restart on "A" Train VC/YC. A high priority work request, 542740PS, was initiated to block open 1CR-D-9 and to investigate and repair the malfunctioning damper.

Compliance was notified at 0000 hours on October 24, 1990 that T/S 3.0.3 had been entered for Units 1 and 2. Due to the relatively simple task of blocking open damper 1CR-D-9, the Operations Shift Supervisor anticipated an expeditious return of "A" Train VC/YC to service before the seven hour T/S interpretation expiration time would elapse. A reduction in power levels was not expected, nevertheless, preparations were initiated for an orderly power reduction.

At 0015 hours the Duty Manager and the NRC Resident Inspector were notified.

At 0055 hours, Damper 1CR-D-9 was manually blocked open allowing "A" Train VC/YC restart. At that time, T/S 3.0.3 was exited. Since both Units were in Mode 1, Power Operation, and only one train of VC/YC was operable, T/S 3.7.6 was entered placing Units 1 and 2 in a seven day action statement.

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

Subsequently, at 0100 hours, a high priority work request, 474850PS, was written to investigate and repair "B" Train YC chiller. The chiller oil pressure switch was found out of calibration and corrected. The chiller was returned to service on October 25, 1990, at which time both Units exited T/S 3.7.6.

CONCLUSION

This incident is attributed to equipment failure/malfunction. Damper 1CR-D-9 failed due to a hydromotor malfunction which provides the operation for damper travel. A review of all ventilation systems which utilize hydromotors shows a history of failures. Catawba Nuclear Station has requested a Design Study, CNDS-0115/00, which will provide the following information:

- 1) A review of all ITT actuator applications at Catawba Nuclear Station to identify acceptable replacement actuators.
- 2) Development of specification documents for replacement pneumatic and electro-hydraulic actuators as required.
- 3) Selection of qualified replacement actuators and vendor(s).
- 4) A total cost estimate for Catawba Nuclear Station ITT actuator replacement including vendor developmental costs as required.
- 5) Development of milestone schedule for release of design documents and hardware procurement to support actuator replacement.
- 6) Development of a NSM scope document.

At this time, two vendors have been contacted to develop a totally electric type actuator for the hydromotor replacement. Currently, prototypes are being built. Upon a satisfactory replacement, Maintenance will initiate a Station Problem Report (SPR) to install the more reliable electric actuators starting with the Annulus Ventilation [EIIS:VD] (VE) System. Maintenance has estimated a suitable replacement may be available by January, 1991.

This incident is also attributed to a Management Deficiency, due to a less-than-adequate Preventive Maintenance (PM) Program. The failure of YC "B" Train chiller to start is attributed to an oil pressure switch, OYCP9102B, being out of calibration. These particular chiller pressure switches were not on the PM Program at the time of failure; however, Maintenance has prepared a Standing Work Request (SWR) to place these chiller pressure switches on the PM Program and requested development completion by February, 1991. Inclusion of these pressure switches to the PM Program will reduce the probability of a similar failure of this type in the future.

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TEXT (If more space is required, use additional NRC Form 358A's) (17)

A review of the Operating Experience Program data base for the past 24 months prior to this event revealed two T/S 3.0.3 Action Statements entered due to both trains of VC/YC being inoperable. These problems were documented in LERs 413/90-023 and 413/89-010. Since both trains of the VC/YC system were inoperable and T/S 3.0.3 Action Statement was entered, the problem is considered to be recurring. Corrective actions for LERs 413/89-023 and 413/89-010, would not have prevented this event.

As a result of numerous problems associated with the ventilation systems, including VC/YC, an engineering task force has been established at Catawba to review these systems and identify corrective actions required to improve their availability.

This event is not Nuclear Plant Reliability Data System (NPRDS) reportable.

CORRECTIVE ACTION

IMMEDIATE

- 1) A Train of VC/YC was secured.
- 2) Efforts to block open damper 1CR-D-9 were initiated.

SUBSEQUENT

- 1) Damper 1CR-D-9 was blocked open per 108913WR and VC/YC "A" Train restarted.
- 2) Damper 1CR-D-9 hydromotor was repaired on 542740PS work request.
- 3) VC/YC "B" Train chiller oil pressure switch was calibrated on 474850PS work request.

PLANNED

- 1) The present electro-hydraulic ITT actuators will be replaced with a more reliable actuator.
- 2) Oil pressure switches on the VC/YC system chillers will be included on the Preventive Maintenance Program.

SAFETY ANALYSIS

The Control Room Area Ventilation systems are engineered safety features. Each redundant train (100 percent capacity) of air handling units, water chillers, pumps [EIIS:P], pressurizing filter trains and fans, and outside air intake isolation valves [EIIS:V] are served from separate trains of the Emergency Class

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

1E Power System. This assures the integrity and availability of one train of the Control Room Area Ventilation System in the event of any single active failure.

The Control Room Area Ventilation System is designed to maintain temperature, cleanliness and pressurization in the areas served during normal plant operation, shut-down, post-accident conditions, and in all feasible weather conditions.

The principle contaminant contained in air leaking into the Control Room is assumed to be radioactive Iodine. Very low amounts of Iodine would be expected to reach the area around the Control Room since this requires passage through either Auxiliary or Turbine Building Ventilation systems [EIIIS:VF,VK] or passageways first.

In the event the Control Room atmosphere became unbreathable, self contained breathing apparatus (SCBA) provided in the Control Room area could be employed. Radiation monitors in the Control Room would alert Control Room personnel of high radiation levels.

During the brief time Units 1 and 2 entered Technical Specification (T/S) 3.0.3, Operations personnel were confident that returning the "A" Train of the Control Room Ventilation (VC) System to service could easily be achieved. Blocking open these dampers is a simple task and is addressed in Operating Management Procedure (OMP) 2-29. The needed manual damper alignment was well understood and was in progress. The probability of an incident occurring requiring VC/YC operation to pressurize the Control Room during the brief period of inoperability was extremely low, approximately 1.6E-10. At no time during this incident was Control Room safety or habitability affected.

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