



Gary R. Peterson
Vice President

Duke Power
Catawba Nuclear Station
4800 Concord Road
York, SC 29745
(803) 831-4251 OFFICE
(803) 831-3426 FAX

June 26, 2000

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

Subject: Duke Energy Corporation
Catawba Nuclear Station, Unit 1
Docket Nos. 50-413
Licensee Event Report 413/00-004, Revision 0

Attached please find Licensee Event Report 413/00-004, Revision 0, entitled "Operation Prohibited by Technical Specification 3.7.12 Due to Inadequate Control of the Auxiliary Building Filtered Ventilation Exhaust System Pressure Boundary."

Regulatory commitments are stated in the planned corrective action section of this report.

This event is considered to be of no significance with respect to the health and safety of the public. If there are any questions regarding this report, please contact M. S. Purser at 803-831-4015.

Sincerely,

Gary R. Peterson

Attachment

JE22

U. S. Nuclear Regulatory Commission

June 26, 2000

Page 2

xc: L. A. Reyes, Regional Administrator, Region II
U. S. Nuclear Regulatory Commission
Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, GA 30303

C. P. Patel, NRR Senior Project Manager (CNS)
U. S. Nuclear Regulatory Commission
Mail Stop O-8 H12
Washington, DC 20555-0001

D. J. Roberts, Senior Resident Inspector (CNS)
U. S. Nuclear Regulatory Commission
Catawba Nuclear Station

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.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Catawba Nuclear Station, Unit 1	DOCKET NUMBER (2) 05000413	PAGE (3) 1 of 8
---	--------------------------------------	---------------------------

TITLE (4)
Operation Prohibited by Technical Specification 3.7.12 Due to Inadequate Control of the Auxiliary Building Filtered Ventilation Exhaust System Pressure Boundary

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)
05	25	2000	2000	- 004	- 00	06	26	2000		
									FACILITY NAME	DOCKET NUMBER(S)
									FACILITY NAME	DOCKET NUMBER(S)

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	20.2201(b)			20.2203(a)(2)(v)			X 50.73(a)(2)(i)			50.73(a)(2)(viii)	
	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)			X 50.36(c)(2)			50.73(a)(2)(vii)					

LICENSEE CONTACT FOR THIS LER (12)

NAME Martha S. Purser, Regulatory Compliance	TELEPHONE NUMBER (803) 831-4015
--	---

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
N/A									

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

ABSTRACT (Limit to 1400 spaces, i.e. approximately fifteen single-space typewritten lines) (16)
 On May 25, 2000 with Unit 1 operating in Mode 1, Power Operation, at 100 percent power, while working on their qualifications, Operations' personnel discovered Unit 1 operating in a condition prohibited by Technical Specification (TS) 3.7.12 due to inadequate control of the Auxiliary Building Filtered Ventilation Exhaust System (ABFVES) pressure boundary. This determination was made subsequent to finding Doors AX 221 and the AX 221B to the 1A Centrifugal Charging Pump (CCP) Room in the open position. With both AX 221 and AX 221B open, the ABFVES was not able to maintain negative pressure in the 1A CCP Room relative to all adjacent areas as required by TS 3.7.12. The root cause of this event was inadequate work practices by unknown personnel. A contributing cause was the design and configuration of AX 221 and AX 221B that created a condition whereby the doors could get caught on each other and prevent auto closure. Immediate action was taken to close AX 221 and AX 221B to restore the ABFVES pressure boundary. AX 221B was subsequently removed to preclude recurrence and the configuration of doors to the other ECCS pump rooms on both units was reviewed to ensure similar conditions did not exist.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Catawba Nuclear Station, Unit 1	05000413	2000	004	00	2 of 8

Background

Catawba Nuclear Station, Unit 1 is a four loop Westinghouse pressurized water reactor [EIIS:RCT]. Unit 1 was operating in Mode 1, Power Operation, at 100 percent power at the time of this event.

The Auxiliary Building Filtered Ventilation Exhaust System (ABFVES) [EIIS:VF] normally filters air exhausted from all potentially contaminated areas of the Auxiliary Building [EIIS:NF]. This includes the Emergency Core Cooling System (ECCS) pump rooms and other parts of the Auxiliary Building. The ABFVES in conjunction with other systems provides ventilation for these areas of the Auxiliary Building. Upon receipt of an Engineered Safety Features Actuation Signal (ESFAS), the ABFVES exhausts air from the ECCS Pump Rooms while the other areas of the Auxiliary Building are isolated.

Technical Specification 3.7.12, Auxiliary Building Filtered Ventilation Exhaust System, requires two operable trains in Modes 1 through 4. Surveillance Requirement 3.7.12.4 verifies that one train of ABFVES can maintain the ECCS Pump Rooms at negative pressure relative to adjacent areas.

AX 221 (inner door) and AX 221B (outer door) to 1A CCP Room (Room 230) were installed in close proximity to each other. The physical arrangement of these doors created a condition whereby they could catch on each other and remain in the open position. When these doors caught on each other and remained in the open position, the ABFVES was not able to maintain negative pressure in the 1A CCP Room (Room 230). This rendered both trains of ABFVES inoperable per Technical Specification 3.7.12. and Technical Specification 3.0.3 was subsequently entered.

This event is being reported pursuant to 10 CFR 50.36 (c) (2), Technical Specification Limiting Conditions for Operation not Met, and 10 CFR 50.73 (a) (2) (i) (B), Operation Prohibited by Technical Specification.

Event Description

05-25-2000 0832 The AX 221(inner door) and AX 221B (outer door) leading from the 1A CCP Room (Room 230) were

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Catawba Nuclear Station, Unit 1	05000413	2000	004	00	3 of 8

discovered in the open position.

Personnel were directed to close AX 221 (inner door) and AX 221B (outer door).

0921 A one-hour event notification report (NRC Report Number 37031) was made to Region II under 10 CFR 50.72 (b) (1) (ii) (B), Operation in a Condition Outside the Design Basis. This report was based on both trains of the Auxiliary Building Filtered Ventilation Exhaust System being inoperable because negative pressure could not be maintained in the 1A CCP Room (Room 230) with AX 221 (inner door) and AX 221B (outer door) in the open position.

05-26-2000 0014 The removal of the AX 221B (outer door) to the 1A CCP Room (Room 230) was completed under work order 98280161-01.

05-31-2000 Interviews of personnel who were known to have entered the Auxiliary Building between 1800 on May 24, 2000 and 0900 on May 25, 2000 were completed. Based on these interviews, the culpable individual could not be determined.

06-22-2000 1610 NRC Event Notification Report Number 37031 was retracted.

Causal Factors

The root cause of this event was inadequate work practices by unknown personnel during egress of 1A CCP Room (Room 230) when they failed to recognize the doors remained in the open position. A contributing cause of this event is the design and configuration of AX 221 (inner door) and AX 221B (outer door). AX 221 (inner door) leading out of 1A CCP Room (Room 230) opens outward into a small vestibule. This vestibule has another door, AX 221B (outer door), which opens inward. This configuration created a condition whereby the doors could catch on each other due to their close

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Catawba Nuclear Station, Unit 1	05000413	2000	004	00	4 of 8

proximity to each other and prevent auto closure. On May 25, 2000 at 0832 it was discovered that these doors had caught on each other and remained in the open position. With these doors in this arrangement, the ABFVES was unable to maintain a negative pressure in the 1A CCP Room (Room 230) due to the loss of the pressure boundary for the pump room.

The configuration of the doors installed at the ECCS pump rooms on both units was reviewed. Based on this review, it was determined that the configuration of the 1A CCP Room (Room 230) doors was unique. The physical configuration of the doors leading to other ECCS pump rooms allowed adequate clearance such that the doors could not catch on each other and remain open. In addition, all doors, including AX 221 and AX 221B, are clearly labeled to indicate that action (Contact Work Control Center) is necessary before securing the doors open.

Personnel who entered the Auxiliary Building between 1800 on May 24, 2000 and 0900 on May 25, 2000 were interviewed. The culpable individual of this event was not identified during these interviews. Operations' personnel who performed routine Auxiliary Building rounds in 1A CCP Pump Room (Room 230) and another Operations' individual who was in the general area between 2000 and 2100 on May 24, 2000 did not observe AX 221 (inner door) and AX 221B (outer door) in the open position. Based on interviews of other individuals who entered the Auxiliary Building, it could not be determined that any other entries had been made into the 1A CCP Room (Room 230) after approximately 2100.

A review of other Licensee Event Reports (LERs) for the past twenty-four months indicates one event of a similar nature with a similar root cause. LER 413/99-008 reported an event that involved operation prohibited by Technical Specification 3.5.2 due to an inoperable centrifugal charging pump and operation prohibited by Technical Specification 3.7.12 due to inadequate control of the ABFVES pressure boundary in which the need for compensatory measures was not implemented appropriately prior to propping doors open which affected the ABFVES. Since these LERs describe similar events with slightly different root causes, this event is considered to be recurring. Corrective actions taken subsequent to the previous event would not have prevented this event. To prevent recurrence of this event, AX 221B (outer door) was removed.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Catawba Nuclear Station, Unit 1	05000413	2000	004	00	5 of 8

This failure is not EPIX reportable.

Corrective Actions

Immediate

1. AX 221 (inner door) and AX 221B (outer door) leading to the 1A CCP Room (Room 230) were closed.

Subsequent

1. The configuration of the CCP room doors installed on both units was reviewed. This review determined that the configuration of the doors leading to the 1A CCP Room (Room 230) was unique to that set of doors.
2. To preclude recurrence, AX 221B (outer door) was removed under work order 98280161-01, per the modification process to control configuration.
3. The importance of self-checking to ensure doors close properly was covered in the Station Division Team Notes on May 31, 2000.
4. Based on the safety analysis of this event, it was determined that the plant did not operate outside the design basis, therefore, NRC Report Number 37031 was retracted on June 22, 2000.

Planned

1. The configuration of other Technical Specification-related doors will be reviewed to ensure there is no physical interference that would prevent doors from auto-closure.

Safety Analysis

Introduction

The plant configuration and circumstances leading up to the event of leaving the CCP 1A Room doors open have been reviewed by Catawba Engineering. This review concluded that the health and safety of the public

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Catawba Nuclear Station, Unit 1	05000413	2000	004	00	6 of 8

were not affected by this event. This conclusion was reached based on the following factors:

- Current external leakage from systems that may contain post accident ECCS sump fluids are well within the amounts assumed within the Dose Analysis.
- The pump room boundaries that were not negative with respect to adjacent areas are sealed and do not allow for a credible air flow path between the two areas.
- Assuming that such a flow path did exist between these areas, the Unit 1 Auxiliary Building Filtered Exhaust Units would still have filtered all leakage.

Background

After a Loss of Coolant Accident (LOCA), the ECCS systems suction will swap from the Refueling Water Storage Tank to the containment sump for long-term recirculation cooling. It is postulated that mechanical joints in the ECCS pump/piping systems may leak this highly radioactive fluid. According to the Catawba Updated Final Safety Analysis Report (UFSAR) this leakage is assumed to primarily consist of minor leakage from the pump seals. The post accident function of the ABFVES is to ensure that this leakage from within the ECCS Pump Rooms is filtered prior to its release from the Auxiliary Building. The ABFVES accomplishes this by drawing sufficient air from the ECCS pump rooms to ensure they are at a negative pressure with respect to adjacent non-ECCS Pump Room Areas. This air is drawn through a filter unit consisting of pre-filter, high efficiency particulate filter (HEPA), carbon bed, and post HEPA prior to discharge to the Unit Vent.

ECCS Pump Rooms in this context include the CCP Rooms, Safety Injection Pump Rooms, Residual Heat Removal Pump Rooms and Containment Spray Pump Rooms. There are eight pump rooms total for each unit and all are located on either the 522 or 543 elevation of the Auxiliary Building.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Catawba Nuclear Station, Unit 1	05000413	2000	004	00	7 of 8

ECCS Leakage

The Catawba Dose Analysis conservatively assumes that a one-gallon per minute (gpm) leak exists within the ECCS Pump Rooms for the duration of the analysis. This leakage is assumed to be filtered. The analysis also assumes a constant leakage of 0.3 gpm outside the ECCS Pump Rooms that is unfiltered. Catawba monitors leakage from both of these areas on an ongoing basis. On May 25, 2000, the total of all leakage from Unit 1 components in both the ECCS and non-ECCS pump room areas was significantly less than the 0.3 gpm assumed to be unfiltered. As a result even if the post accident sump leakage was not drawn through the filter, the results of the dose analysis would remain bounding.

Centrifugal Charging Pump Room 1A Boundary

The pump room is located on the 543 elevation. Above the pump room is the 560 elevation general area. Testing confirmed that even with the doors open the pump room was negative with respect to this area. On the 543 elevation the pump room is bounded on two sides by the 543 elevation general area. Testing confirmed that even with the doors open the pump room was negative with respect to this area. The pump room is bounded on another side by the 543 mechanical penetration room. Testing demonstrated that the pump room was very slightly positive with respect to this area. All penetrations in the wall between these two areas are sealed with fire stops. As a result there are no significant credible leakage paths between these two areas especially with the very low positive differential pressure that existed between these two rooms. The other side of the room is bounded by 1B CCP Room, which is within the ECCS Ventilation Boundary. Below the 1A CCP Room is either the 522 elevation pipe chase or ground upon which the plant rests. Testing demonstrated that the pump room was very slightly positive with respect to the 522 elevation pipe chase. The only pipes through this floor are embedded in the concrete of the pump room floor. As a result there is no credible leakage path between the pump room and these areas.

Centrifugal Charging Pump Room 1A Air Flow Path

Even though the 543 penetration room and the 522 pipe chase are not within

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Catawba Nuclear Station, Unit 1	05000413	2000	004	00	8 of 8

the ECCS Ventilation Boundary, air is drawn from these areas through the filters when the Auxiliary Building Filtered Ventilation Exhaust System is in the ECCS alignment. As a result, even if radioactive airborne byproducts of post accident containment sump leakage did leak across the wall to the 543 penetration room or through the floor to the 522 pipe chase, this leakage still would have been filtered prior to its release to the environment.

It should be noted that neither of these two areas is considered to be accessible under post accident conditions and no post accident operator actions are required in either of these areas.

Conclusion

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