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Gary R. Peterson
Vice President
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December 10, 2001

U. S. Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555-0001

SUBJECT: Duke Energy Corporation
Catawba Nuclear Station Units 1 & 2
Docket Nos. 50-413, 50-414
Licensee Event Report 413/01-003 Revision 0
Control Room Ventilation System Inoperability due
to Accuracy of Flow Measurements Resulting in Non-
Compliance with Technical Specifications

Attached please find Licensee Event Report 413/01-003
Revision 0, entitled "Control Room Ventilation System
Inoperability due to Accuracy of Flow Measurements Resulting
in Non Compliance with Technical Specifications."

This Licensee Event Report does not contain any regulatory
commitments. This event is considered to be of no
significance with respect to the health and safety of the
public. Questions regarding this Licensee Event Report
should be directed to R. D. Hart at (803) 831-3622.

Sincerely,

G. R. Peterson

Attachment

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xc:

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LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NE0B-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose 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.

1. FACILITY NAME Catawba Nuclear Station, Unit 1	2. DOCKET NUMBER 050- 00413	3. PAGE 1 OF 7
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4. TITLE
Control Room Ventilation System Inoperability due to Accuracy of Flow Measurements Resulting in Non-Compliance with Technical Specifications

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
10	11	2001	2001	- 003 -	00	12	10	2001	Catawba Unit 2	050-00414
									FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE	10. POWER LEVEL	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)					
1	100	20.2201(b)	20.2203(a)(3)(ii)	50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)		
		20.2201(d)	20.2203(a)(4)	50.73(a)(2)(iii)	50.73(a)(2)(x)		
		20.2203(a)(1)	50.36(c)(1)(i)(A)	50.73(a)(2)(iv)(A)	73.71(a)(4)		
		20.2203(a)(2)(i)	50.36(c)(1)(ii)(A)	50.73(a)(2)(v)(A)	73.71(a)(5)		
		20.2203(a)(2)(ii)	X 50.36(c)(2)	50.73(a)(2)(v)(B)	OTHER		
		20.2203(a)(2)(iii)	50.46(a)(3)(ii)	50.73(a)(2)(v)(C)	Specify in Abstract below or in NRC Form 366A		
		20.2203(a)(2)(iv)	50.73(a)(2)(i)(A)	50.73(a)(2)(v)(D)			
		20.2203(a)(2)(v)	X 50.73(a)(2)(i)(B)	50.73(a)(2)(vii)			
		20.2203(a)(2)(vi)	50.73(a)(2)(i)(C)	50.73(a)(2)(viii)(A)			
		20.2203(a)(3)(i)	50.73(a)(2)(ii)(A)	50.73(a)(2)(viii)(B)			

12. LICENSEE CONTACT FOR THIS LER

NAME R. D. Hart, Regulatory Compliance	TELEPHONE NUMBER (Include Area Code) 803-831-3622
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

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

16. ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On October 11, 2001, Engineering review of recent past performance tests for the control room area ventilation system (CRAVS) determined that on at least two separate occasions A train of CRAVS did not meet the Technical Specification (TS) requirement for system flow. The tests were conducted on 2/25/00 and 4/13/00. This is not in compliance with TS requirements and resulted in A train of CRAVS being inoperable longer than allowed by TS. During the time frame that A train of CRAVS was not in compliance with TS, B train of CRAVS was taken out of service on 33 separate occasions. This resulted in both trains of CRAVS being inoperable at the same time which is also not in compliance with TS. The most probable cause was that during the startup testing of the system the results from the air flow monitor devices (AFMDs) for both trains were not validated to ensure the accuracy of the installed flow instrumentation. Pitot traverse ports were installed in the CRAVS to ensure accurate airflow readings and the CRAVS was tested, balanced and declared operable. The airflow values reviewed did not adversely affect the dose analysis for the control room, the CRAVS filter efficiencies, or the ability to pressurize the control room.

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NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

BACKGROUND

Catawba Nuclear Station Units 1 and 2 are Westinghouse Pressurized Water Reactors [EIIS: RCT]. The Control Room Area Ventilation System (CRAVS) [EIIS: VI] is designed to maintain the environment in the control room [EIIS: NA] and control room area within acceptable limits for the operation of unit controls, for maintenance and testing of the controls as required, and for uninterrupted safe occupancy of the control room during post-accident conditions. This function is accomplished by pressurizing the control room to greater than or equal to 0.125 inch water gauge with respect to all surrounding areas, by filtering the outside air used for pressurization, by filtering a portion of the return air from the control room to clean up the control room environment, and by maintaining the control room temperature less than 90 degrees Fahrenheit. The system is comprised of two redundant trains so that it will be able to perform its required function in the event that a single failure disables one train. Each train consists of a prefilter, a high efficiency particulate air (HEPA) filter, an activated carbon adsorber section for removal of gaseous activity (principally iodines), and a fan. Ductwork, dampers, and instrumentation also form part of the system. The CRAVS can be operated either manually or automatically. Key operated selector switches located in the control room initiate operation of all equipment in a train. The selected train is in continuous operation. Upon receipt of an accident-initiating signal, the selected CRAVS train continues to operate and the pressurizing filter train and fan of the non-selected train is started. This assures control room pressurization, assuming an active failure of one of the pressurizing filter trains.

Technical Specification (TS) 3.7.10 "Control Room Area Ventilation System (CRAVS)" requires two CRAVS trains to be operable in Modes 1,2,3,4,5,6, and during movement of irradiated fuel assemblies and during core alterations. With one CRAVS train inoperable the required action A.1 is "...to restore it to operable status within 7 days." Condition C applies when the required action and associated completion time of Condition A is not met in Mode 1,2,3, or 4 and it requires the unit to be in Mode 3 within 6 hours and in Mode 5 within 36 hours. With two CRAVS trains inoperable in Modes 1,2,3 or 4 the required action F.1 is "...to enter TS 3.0.3 immediately". TS surveillance requirement (SR) 3.7.10.2 requires the following "Perform required CRAVS testing in accordance with the Ventilation

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Filter Testing Program (VFTP)". TS section 5.5.11 describes the requirements of the VFTP. It specifies flow rates at which the CRAVS shall be tested. The requirement for the CRAVS is 6000 cfm with a tolerance of +/- 10%. TS SR 3.7.10.4 requires the following "Verify one CRAVS train can maintain a positive pressure of >= 0.125 inches water gauge, relative to the adjacent areas during the pressurization mode of operation at a makeup flow rate of <= 4000 cfm" once per 18 months on a STAGGERED TEST BASIS.

On October 11, 2001, Plant Engineering review of past performance tests for the CRAVS determined that on at least two separate occasions A train of CRAVS did not meet the TS requirement of 6000 cfm with a tolerance of +/- 10% for system flow. The tests were conducted on 2/25/00 and 4/13/00. This is not in compliance with TS requirements and resulted in A train of CRAVS being inoperable longer than allowed by TS. During the time frame that A train of CRAVS was not in compliance with TS, B train of CRAVS was taken out of service on 33 separate occasions. This resulted in both trains of CRAVS being inoperable at the same time which is also not in compliance with TS.

This event is being reported under 10CFR50.73(a)(2)(i)(B) (any operation or condition prohibited by the plant's Technical Specifications (TS)), and 10CFR50.36(c)(2)(i) (Limiting Condition for Operation (LCO) not met).

At the time this condition was identified, Unit 1 was operating in Mode 1, "Power Operation" and Unit 2 was operating in Mode 5, "Cold Shutdown" immediately prior to this event. No structures, systems, or components were out of service at the time of this event that contributed to the event.

EVENT DESCRIPTION

(Dates and times are approximate)

Catawba Nuclear Station (CNS) was performing CRAVS testing to quantify Control Room unfiltered inleakage to support potential changes in TS. CNS hired a vendor to perform tracer gas testing to determine unfiltered inleakage into the Control Room and to measure CRAVS flow rates. PT/O/A/4450/008, "Control Room Area Ventilation System Performance Test," is used to perform the 18-month TS surveillance requirements and document CRAVS flow rates.

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Tracer gas testing was performed for both trains of CRAVS. The preliminary results of this testing indicated that the airflow monitoring devices (AFMDs) were reading high on both trains of CRAVS due to their location in the ducts. New pitot traverse test ports were installed on both trains of CRAVS at the inlet to the pressurizing filter fan, discharge to the CRAVS air handling unit and recirculation from the Control Room to the pressurizing filter fan. PT/O/A/4450/008 was revised to allow use of pitot traverse to measure CRAVS flows. Airflow measurements were performed with the pitot traverses to validate the TS required airflow rates for the CRAVS. The testing with the pitot traverse ports indicated that both trains were reading lower than the testing with the AFMDs, so both trains of CRAVS were rebalanced as necessary. This was done for A train CRAVS from 9/9/01 - 9/10/01 and for B train CRAVS from 9/12/01 - 9/13/01. This testing and rebalancing ensured that the CRAVS airflow rates were within those required by TS and that both trains of CRAVS were operable.

The pitot traverse tests were compared with those from AFMDs. It was determined that both CRAVS train's AFMDs were reading high. Based on this information, engineering reviewed past test data for both trains of CRAVS and a correction factor based on pitot traverses was applied to the past data from airflow monitors to determine if in the past 3 years the TS air flow requirements had not been met. This review determined, on October 11, 2001, that on at least two occasions the TS requirements for total flow of 6000 cfm +/- 10% was not met. Train A of CRAVS was tested on 2/25/00 and the corrected flow rate was 5362 cfm, which did not meet the TS requirement of 5400 cfm. On 4/13/00 train A of CRAVS was tested and the corrected flow rate was 5333 cfm which did not meet the TS requirement of 5400 cfm. Therefore, A train of CRAVS did not meet the TS requirement for airflow from 2/25/00 until 9/10/01. This is longer than allowed by TS and therefore is a condition prohibited by TS.

A review of the Technical Specification Action Item Log (TSAIL) used by Operations to document when TS required equipment was taken out of service was conducted. This review determined that during the time frame that A Train of CRAVS did not meet the required TS flow, B Train of CRAVS was taken out of service for 33 times. In this condition, both trains of CRAVS were inoperable. This placed both Units into Condition F of TS 3.7.10. The Required Action for

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Condition F is to enter TS 3.0.3 immediately. This was not done for these occurrences since the condition of A Train of CRAVS not in compliance with TS was unknown. Operations took B Train of CRAVS out of service in accordance with approved procedures and following TS, as they understood the status of CRAVS at the time. For the 33 occurrences 2 were for less than 1 hour, 11 were for >/= 1 hour but < 7 hours, and 20 were for >/= 7 hours.

CAUSAL FACTORS

The most probable cause was that during the startup testing of the system the results from the AFMDs were not validated to ensure the accuracy of the installed flow instrumentation.

A review of startup test data indicates that this condition has most likely existed since startup of the units. The TS airflow rates have been obtained using the AFMDs. This has been an accepted industry practice for obtaining airflow measurements.

CORRECTIVE ACTIONS

Immediate:

1. Pitot traverse ports were installed in the CRAVS to ensure accurate airflow readings and the CRAVS was tested, balanced and declared operable.

Subsequent:

1. PT/O/A/4450/008 was revised to allow for the use of pitot traverses to measure CRAVS airflow.

Planned:

1. An evaluation of the testing methods of other ventilation systems that are tested as part of the Ventilation Filter Testing Program per TS 5.5.11 has been done and the preliminary results indicate that no other systems have similar issue as documented in this LER. This evaluation is currently undergoing review by engineering.

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The planned corrective actions as well as any future corrective actions will be addressed via the Catawba Corrective Action Program. There are no NRC commitment items contained in this LER.

SAFETY ANALYSIS

The CRAVS performs three (3) basic functions: (1) filtration of supply air, (2) pressurization, and (3) temperature control. Of these functions only filtration and pressurization are related to the dose analysis. The filtration function relates to the dose analysis based on filter efficiencies and the quantity of air directed through the filters from outside and through the recirculation loop. The pressurization function of the system is required to support assumptions with the quantity of unfiltered inleakage postulated to enter the control room.

The CRAVS is designed to maintain the control room at a positive pressure to minimize the amount of airborne contamination entering the control room. The CRAVS train A air flow being below TS requirements did not impact the systems ability to pressurize the control room and maintain a positive pressure. It had no effect on the ability to maintain temperature control in the control room. This situation did not prevent CRAVS from actuating on an initiating signal and providing pressurization flow as designed. The airflow values calculated for the past tests that were reviewed did not adversely affect the dose analysis for the control room or the CRAVS filter efficiencies. During the time periods when one train of CRAVS was inoperable for testing and/or maintenance, the other train of CRAVS was available and would have started and performed as it was designed with a lower flow rate.

The Probabilistic Risk Assessment (PRA) evaluated qualitatively, the significance of the CRAVS and determined the system to be of low importance. On this basis, the PRA does not include the CRAVS in the model and no significant impact on core damage frequency is expected.

In conclusion, the overall safety significance of this event was determined to be minimal and there was no actual impact on the health and safety of the public.

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ADDITIONAL INFORMATION

A review of LERs from the last three (3) years found one LER written for the CRAVS. This LER had a different root cause and is not considered similar in nature. Also no events have been reported within the last 3 years due to inaccurate airflow indications. Therefore, this event was determined to be non-recurring in nature.

Energy Industry Identification System (EIIS) codes are identified in the text as [EIIS: XX].

This event did not include a Safety System Functional Failure nor involve a personnel error. There were no releases of radioactive materials, radiation exposures or personnel injuries associated with this event.