



Duke Energy Corporation
McGuire Nuclear Station
12700 Hagers Ferry Road
Huntersville, NC 28078-9340
(704) 875-4800 OFFICE
(704) 875-4809 FAX

H. B. Barron
Vice President

January 14, 2000

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

Subject: McGuire Nuclear Station, Unit 1
Docket No. 50-369
Licensee Event Report 369/99-02, Revision 1
Problem Investigation Process No. M-99-5583

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a) (1) and (d), attached is Licensee Event Report 369/99-02, Revision 1, concerning an instance where the McGuire Unit 1 Annulus Ventilation System was inoperable for a period of time longer than allowed by plant Technical Specifications. This report is being submitted in accordance with 10 CFR 50.73 (a) (2) (i) (B). Note that an abstract of this event was previously submitted on December 17, 1999. This event is considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

H. B. Barron, Jr.

Attachment

cc: L. A. Reyes
U.S. Nuclear Regulatory Commission
Region II
Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, GA 30323

INPO Records Center
700 Galleria Parkway
Atlanta, GA 30339
(Sent Electronically)

F. Rinaldi
U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D.C. 20555

S. Shaeffer
NRC Resident Inspector
McGuire Nuclear Station

IE22

LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-8 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.

FACILITY NAME (1) McGuire Nuclear Station, Unit 1		DOCKET NUMBER (2) 05000369	PAGE (3) 1 of 9
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TITLE (4) **Annulus Ventilation Inoperable In Excess Of TS Allowed Time**

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)
11	30	99	99	- 02	- 1	01	14	00	N/A	05000 05000

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)	91%	20.402(b)	20.405(a)(1)(i)	20.405(a)(1)(ii)	20.405(a)(1)(iii)	20.405(a)(1)(iv)	20.405(a)(1)(v)	20.405(c)	50.36(c)(1)	50.36(c)(2)	X	50.73(a)(2)(i)	50.73(a)(2)(ii)	50.73(a)(2)(iii)	50.73(a)(2)(iv)	50.73(a)(2)(v)	50.73(a)(2)(vi)	50.73(a)(2)(vii)(A)	50.73(a)(2)(vii)(B)	50.73(a)(2)(x)	73.71(b)	73.71(c)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)

LICENSEE CONTACT FOR THIS LER (12)		TELEPHONE NUMBER	
NAME	Julius W. Bryant	AREA CODE	(704)
			875-4162

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*
A2b	VD	PT	I204	EPIX Reportable					

SUPPLEMENTAL REPORT EXPECTED (14)	YES (if yes, complete EXPECTED SUBMISSION DATE)	X	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e. approximately fifteen single-space typewritten lines) (18)

Unit Status: Unit 1 was in Mode 1 (Power Operation) at 91 percent power.

Event Description: On 11/30/99, an Annulus Ventilation (VE) System pressure gage was discovered to be indicating low. Personnel prioritizing the work for repair of the gage believed that the failure was an indication problem only which did not impact operability of the VE system. Consequently, work on the gage did not begin until 12/9/99. Subsequently, maintenance personnel determined the gage problem was caused by a failed transmitter power supply. This failed power supply prevented the 1A VE Train from performing its safety function. Therefore, the 1A Train of VE was inoperable from 11/30/99 until the affected VE instrument loop was repaired and restored to service on 12/10/99. On 12/7/99, the 1B Train of VE was also inoperable, but functional, for approximately 15 hours due to the inoperable 1A VE Train concurrent with scheduled maintenance on the 1B Emergency Diesel Generator. The above inoperable VE periods exceeded the required action times specified in Technical Specifications 3.6.10 and 3.0.3.

Event Cause: Inadequate communications resulted in a failure to identify impact of the gage failure on VE System operability in a timely manner.

Corrective Action: Revise and reemphasize plant processes to ensure emerging work items receive adequate review for Technical Specification implications. This event will be discussed with the licensed operators as part of Operator Training.

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

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
McGuire Nuclear Station, Unit 1	05000 369	99	02	1	2 OF 9

BACKGROUND:

The Annulus Ventilation (VE) System operates to maintain a negative pressure zone in the annular space between the steel primary containment and the concrete reactor building. This negative pressure prevents the unfiltered leakage of radioisotopes through the reactor building and into the environment following a loss of coolant accident (LOCA). The VE system also provides long-term fission product removal capability.

The VE system consists of two 100 percent trains. Each train consists of a fan, moisture eliminator, pre-heater, pre-filter, high efficiency particulate air (HEPA) filters, carbon adsorber, dampers, and controls. The VE fans automatically start, and dampers align, upon actuation of a Containment Isolation Phase B signal. Upon actuation of the system, pressure transmitters 1VEPT5100 and 1VEPT5110 provide signals to align exhaust and recirculation dampers on the 1A and 1B VE Trains respectively. These dampers place the applicable train in the exhaust mode when annulus pressure reaches -1.2 inches water gage increasing and to recirculation mode when annulus pressure reaches -4.2 inches water gage decreasing. These setpoints represent the pressure range within which the VE system operates while performing its design function following a LOCA. The inability to position a VE Train's dampers as needed to maintain annulus pressure within this range renders the affected Train of VE inoperable. Note that 1VEPT5100 and 1VEPT5110 also provide signals to the 1A and 1B Annulus pressure gages in the Control Room (1VEP5100 and 1VEP5110 respectively). Correct operation of 1VEP5100 and 1VEP5110 are not required for VE system operability.

EVALUATION:

Description of Event

On 11/30/99, McGuire Unit 1 was in Mode 1 (Power Operation) at 91 percent power. At approximately 0100 hours on that date, an Operations Control Room Operator (RO) reviewing the Control Boards observed that the 1A Train Annulus pressure gage (1VEP5100) was indicating -2.8 inches water gage (gage range is +5 to -5 inches water gage). For the existing plant conditions, this gage should have read approximately 0 inches water gage. The RO checked the 1B Train Annulus pressure gage (1VEP5110) and found it indicated approximately 0 inches as expected. Consequently, the RO concluded that the 1A Train Annulus pressure indication was incorrect due to a failure of 1VEP5100.

Upon identifying the indication problem with 1VEP5100, the RO informed the Control Room Senior Reactor Operator (CRSRO). The CRSRO recognized

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND 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.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
McGuire Nuclear Station, Unit 1	05000 369	99	02	1	3 OF 9

that problems with the instrument loop containing 1VEP5100 could affect operability of the 1A Train of VE. However, he believed that the failure was an indication problem isolated to 1VEP5100 which did not affect the ability of the subject instrument loop to perform its TS related function. Therefore, based upon the information available to him at the time, the CRSRO did not declare the 1A VE Train inoperable. However, he did direct the RO to generate a work request (WR) to perform further investigation of the 1VEP5100 indication failure and its potential effect on VE operability. However, this WR contained no text which indicated that additional investigation into the impact on VE operability was needed. In addition, there was no communication between the RO or CRSRO and the on-duty Shift Work Manager (SWM) related to the need for additional evaluation to confirm the 1VEP5100 problem did not represent a VE operability concern.

Upon initiation of the WR for 1VEP5100, it was reviewed by the on-duty SWM. The SWM is a licensed Senior Reactor Operator responsible for prioritizing the implementation of WRs. Since the RO and CRSRO had not communicated to the SWM, either verbally or via text in the WR, the need for additional evaluation of VE operability, the SWM assigned a priority to the WR that would allow up to four weeks to perform work on 1VEP5100. Supporting this decision was the SWM's belief that any problem with the power supply for the instrument loop containing 1VEP5100 would have caused that gage to fail low instead of indicating -2.8 inches water gage. Upon completion of his work shift on 11/30/99, the SWM who prioritized the WR for 1VEP5100 did not mention the issue with the gage during the turnover briefing with the oncoming SWM. In addition, the subject WR had been administratively processed into a Work Order (WO). WOs do not appear on a list of emerging work items that are reviewed by the offgoing and oncoming SWMs during shift turnover.

A preliminary investigation by maintenance personnel on 11/30/99 determined that the repair of 1VEP5100 would require further planning and scheduling of resources. Consequently, repair of the gage was scheduled for 12/10/99. On 12/9/99, while performing a pre-implementation review of the WO for 1VEP5100, another SWM recognized that the subject gage was associated with a TS related instrument loop (this SWM was not involved with the prioritization of the 1VEP5100 problem on 11/30/99). After discussing this with another on shift Senior Reactor Operator, a decision was made to immediately investigate the problem with 1VEP5100. Consequently, the instrument loop containing 1VEP5100 and 1VEPT5100 and the 1A VE Train were declared inoperable at 0730 on 12/9/99 to facilitate troubleshooting. Maintenance personnel subsequently determined that the indication problem with 1VEP5100 identified on 11/30/99 was caused by a failed power supply in the

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND 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.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
McGuire Nuclear Station, Unit 1	05000 369	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 9
		99	02	1	

instrument loop containing 1VEP5100 and 1VEPT5100. Further evaluation determined that this power supply failure prevented pressure transmitter 1VEPT5100 from providing the signals necessary to position the 1A VE Train dampers as needed for that train to perform it's post-LOCA design function. Upon receipt of a Containment Isolation Phase B signal, the 1A VE Train fan would start as expected and the VE dampers would align to the exhaust mode. Air would be drawn from the Annulus area, filtered, and exhausted to the Unit Vent. When Unit 1 Annulus pressure decreased to -4.2 inches water gage, the 1A VE Train dampers would realign to the recirculation mode during which Annulus pressure would slowly increase towards the -1.2 inches water gage required to realign the 1A VE Train dampers to the exhaust mode. However, upon reaching an Annulus pressure of -1.2 inches water gage, the 1A Train of VE would not have shifted to the exhaust mode since the failed power supply prevented the 1A Annulus pressure transmitter (1VEPT5100) from sending a pressure signal any higher than -2.8 inches water gage. This condition rendered the 1A VE Train inoperable.

McGuire TS 3.6.10 requires that two VE Trains be operable in Modes 1,2,3 and 4. TS 3.6.10, Condition A, states that with one VE Train inoperable, restore the VE Train to operable status within 7 days. Condition C of that TS states that when the required action and associated completion time of Condition A is not met, the unit shall be in Mode 3 within 6 hours and in Mode 5 within 36 hours. McGuire Nuclear Station failed to comply with these TS requirements since the failed 1VEPT5100 power supply rendered the 1A VE Train inoperable from discovery of the 1VEP5100 indication problem at approximately 0100 on 11/30/99 until 1VEPT5100 and the 1A VE Train were declared operable again at 1837 on 12/10/99 following replacement of the power supply and satisfactory completion of functional testing. This represented a TS prohibited operation.

Note that on 12/7/99 at 0308 hours, the 1B Emergency Diesel Generator (EDG) was declared inoperable for scheduled maintenance. The maintenance was performed and the EDG was tested and declared operable again at 1752 hours on 12/7/99. McGuire TS 3.8.1, Condition B, states that, with one EDG inoperable, the required features supported by the inoperable EDG are inoperable when their required redundant feature is inoperable. The 1B EDG supports the 1B Train of VE. The redundant feature for the 1B VE Train is the 1A VE Train. Therefore, with the 1B EDG inoperable as described above, the 1B Train of VE was also inoperable since the inoperable period for the 1B EDG was concurrent with the period of time the redundant 1A VE Train was inoperable as a result of the failed 1VEPT5100 power supply. Since TS 3.6.10 contains no required actions for a condition where both Trains of VE are

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND 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.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
McGuire Nuclear Station, Unit 1	05000 369	99	02	1	5 OF 9

inoperable, McGuire was required to implement the required actions of TS 3.0.3. Since it was not recognized that the 1A and 1B VE Trains were inoperable, the required actions of TS 3.0.3 were not implemented. This represented another TS prohibited operation. Note that, although the 1B Train of VE was technically inoperable, it remained functional and capable of maintaining post-LOCA Unit 1 Annulus pressure within the required range for the entire time that the 1A Train of VE was inoperable.

Conclusion

This event did not result in any uncontrolled releases of radioactive material, personnel injuries, or radiation overexposures. This event is Equipment Performance Information Exchange (EPIX) reportable.

A failed power supply rendered pressure transmitter 1VEPT5100 and the 1A VE Train inoperable from discovery of the 1VEP5100 indication problem at approximately 0100 on 11/30/99 until 1VEPT5100 and the 1A VE Train were declared operable again at 1837 on 12/10/99. During this time period, McGuire Nuclear Station failed to comply with requirements of Condition A of TS 3.6.10. This represented a TS prohibited operation.

Between the hours of 0308 and 1752 on 12/7/99, both trains of the Unit 1 VE system were inoperable during a period of time that the 1B EDG was inoperable due to scheduled maintenance. The 1A VE Train was inoperable due to the failed power supply for 1VEPT5100. As per TS 3.8.1, Condition B, the 1B Train of VE was also inoperable during this period since the inoperable period for the 1B EDG was concurrent with the period of time the redundant 1A VE Train was inoperable as a result of the failed 1VEPT5100 power supply. Since it was not recognized that the 1A and 1B VE Trains were inoperable, the required actions of TS 3.0.3 were not implemented. This represented another TS prohibited operation. Note that, although the 1B Train of VE was technically inoperable, it remained functional and capable of maintaining post-LOCA Unit 1 Annulus pressure within the required range for the entire time that the 1A Train of VE was inoperable.

The cause of this event was determined to be inadequate communications between operations personnel who initially identified the indication problem with 1VEP5100 (RO and CRSRO) and the SWM who initially prioritized the WR for 1VEP5100. Specifically, the RO and CRSRO failed to indicate to the SWM, either verbally or via text in the WR for 1VEP5100, that further investigation into the impact of the 1VEP5100 indication problem on VE System operability was warranted. If such communications had taken place, it is likely that the subject WR would

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND 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.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
McGuire Nuclear Station, Unit 1	05000 369	99	02	1	6 OF 9

have received an implementation priority that resulted in discovery and repair of the failed power supply for 1VEP5100 and 1VEPT5100 prior to exceeding the allowed action times for TS 3.6.10 and TS 3.0.3.

CORRECTIVE ACTION:

Immediate

1. 1VEPT5100 and the 1A Train of VE were declared inoperable at 0730 on 12/9/99 when it was determined that the observed indication problem with 1VEP5100 could have TS implications (TS Action Item LOG entry M1-99-03629). After repair of the failed power supply for 1VEPT5100 and the completion of post-maintenance functional testing, 1VEPT5100 and the 1A Train of VE were again declared operable at 1837 hours on 12/10/99.

Subsequent

1. Operations management communicated the following expectations to Operations shift personnel:
 - Operations personnel who write a work request shall notify a Senior Reactor Operator that a problem exists. If the problem is in the Control Room, this notification will be made to the CRSRO. If the problem is associated with equipment outside the Control Room, this notification shall be made to the Work Control Center Senior Reactor Operator (WCCSRO).
 - A CRSRO or a WCCSRO who is notified of a problem will evaluate the problem thoroughly to determine if operability concerns exist. A review shall also be performed by the SWM.

Planned

1. Operations Management Procedure 5-8, Shift Senior Reactor Operator Turnovers, will be revised to incorporate processes for ensuring adequate Senior Reactor Operator review of all emerging work items identified during a work shift for TS related operability concerns and appropriate disposition of those work items. This revision will include measures for ensuring any operability concerns with emerging work items are communicated to the appropriate shift management personnel (e.g. SWM and/or Operations Shift Manager).

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-8 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.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
		99	02	1	
McGuire Nuclear Station, Unit 1	05000 369				7 OF 9

- This event will be discussed with the licensed operators as part of Operator Training. This discussion will include emphasis that indication problems, or other seemingly minor problems within an instrument loop, could be symptoms of other component failures which might have TS implications.

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-8 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.

FACILITY NAME (1) McGuire Nuclear Station, Unit 1	DOCKET NUMBER (2) 05000 369	LER NUMBER (6)			PAGE (3) 8 OF 9
		YEAR 99	SEQUENTIAL NUMBER 02	REVISION NUMBER 1	

SAFETY ANALYSIS:

Based on this analysis, this event is not considered to be significant. At no time were the safety or health of the public or plant personnel affected as a result of the event.

The VE System operates to maintain a negative pressure zone in the annular space between the steel primary containment and the concrete reactor building. This negative pressure prevents the unfiltered leakage of radioisotopes through the reactor building and into the environment following a LOCA. The VE system also provides long-term fission product removal capability.

The system consists of two 100 percent trains. Each train consists of a fan, moisture eliminator, pre-heater, pre-filter, HEPA filters, carbon adsorber, dampers, and controls. The VE fans automatically start, and dampers align, upon actuation of a Containment Isolation Phase B signal. Upon actuation of the system, pressure transmitters 1VEPT5100 and 1VEPT5110 provide signals to align exhaust and recirculation dampers on the 1A and 1B VE Trains, respectively. These dampers place the applicable train in the exhaust mode when annulus pressure reaches -1.2 inches water gage increasing and to recirculation mode when annulus pressure reaches -4.2 inches water gage decreasing. These setpoints represent the pressure range within which the VE system operates while performing its design function following a LOCA. The inability to position a VE Train's dampers as needed to maintain annulus pressure within this range renders the affected Train of VE inoperable.

Between approximately 0100 on 11/30/99 and 1837 on 12/10/99, a failed power supply for the 1A Annulus pressure transmitter 1VEPT5100 prevented that transmitter from providing the signals necessary to position the 1A VE Train dampers as needed for that train to perform its design function. In addition, between the hours of 0308 and 1752 on 12/7/99, the 1B VE Train was inoperable due to scheduled maintenance on the 1B EDG concurrent with the 1A VE Train inoperable period.

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

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FACILITY NAME (1) McGuire Nuclear Station, Unit 1	DOCKET NUMBER (2) 05000 369	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	9 OF 9
		99	02	1	

Note that, during the entire event described in this report, the 100% capacity 1B Train of VE remained functional and capable of performing the VE system safety functions as described below:

1. Maintaining Unit 1 Annulus pressure within the required range for preventing the unfiltered leakage of radioisotopes through the reactor building and into the environment following a LOCA

AND

2. Providing Unit 1 long-term fission product removal capability following a LOCA.

Finally, a review by Duke Energy Severe Accident Analysis personnel determined that unavailability of the VE System does not have an impact on Core Damage Frequency (CDF) or Large Early Release Frequency (LERF). In addition, the VE System is not used in the prevention of core damage accidents. Therefore, this issue has no impact on CDF. At McGuire Nuclear Station, the major contributions to LERF are containment by-pass sequences due to interfacing system LOCAs. The Annulus Ventilation System does not mitigate these types of accident sequences. Therefore, this issue does not impact LERF.