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DUKE POWER

August 9, 1989

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 369/89-06-01

Gentlemen:

Pursuant to 10CFR 50.73 Sections (a)(1) and (d), attached is Licensee Event Report 369/89-06-01 concerning non safety related components installed between safety related solenoids and valve operator on a Containment Isolation valve. This report is being revised and submitted in accordance with 10CFR 50.73(a)(2)(i). This event is considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

T.L. McConnell

T.L. McConnell

ARS/bcb

Attachment

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MC-815-04
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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) McGuire Nuclear Station, Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 6 9 1	PAGE (3) 1 OF 0 4
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TITLE (4)
Non Safety Related Components Were Installed Between Safety Related Solenoids And Valve Operators On A Containment Isolation Valve Because Of A Design Deficiency.

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					
0	3	0	8	9	8	9	0	0	0	5	0	0	0	0
0	3	0	8	9	8	9	0	0	0	5	0	0	0	0

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) 1 0 0	20.402(b)	20.406(c)	50.73(a)(2)(iv)	73.71(b)						
	20.406(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)						
	20.406(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text, NRC Form 35A)						
	20.406(a)(1)(iii)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)	50.73(a)(2)(vii)(A)							
	20.406(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(vii)(B)							
20.406(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(ix)								

LICENSEE CONTACT FOR THIS LER (12)

NAME Alan Sipe, Chairman, McGuire Safety Review Group	TELEPHONE NUMBER 7 0 4 8 7 5 - 4 1 8 3
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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

SUPPLEMENTAL REPORT EXPECTED (14) <input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	EXPECTED SUBMISSION DATE (15) <input checked="" type="checkbox"/> NO
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single space typewritten lines) (16)

On March 30, 1989, Instrumentation and Electrical personnel, inspected the air supply configuration to safety related valve 1NV-459A, Chemical and Volume Control (NV) System Letdown Orifice Containment Isolation. It was discovered that the nonsafety related valve positioner was placed between the safety related solenoid and the valve actuator. Valve 1NV-459A was being inspected to determine the cause of the valve leaking by the seat. On April 10, 1989, IAE personnel completed Work Request No. 137545 which included retubing the nonsafety related positioner for valve 1NV-459A so that the positioner would not be between the safety related solenoids and the valve actuator. Unit 1 was in Mode 5, Cold Shutdown, at the time this event was discovered. This event is assigned a cause of a Design Deficiency because the valve positioner was installed as described by incorrect Instrument Detail drawings prepared by Design Engineering personnel during the initial construction of Unit 1.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

EVALUATION:

Background

The Chemical and Volume Control (NV) system [EIIS:CB] has the following functions:
1) to maintain the required inventory in the Reactor Coolant (NC) System [EIIS:AB];
2) to maintain seal water injection flow to the NC pumps [EIIS:P]; 3) to control NC system chemistry; and 4) to fill and drain the NC system.

Two parallel letdown orifices [EIIS:OR] are provided to reduce the pressure in the letdown piping and control the flow of reactor coolant from the NC system. One orifice is designed for normal operating flow (75 GPM) with the other serving as a standby. The standby orifice is designed to pass 45 GPM, and is used as an alternate flow path. The 45 GPM and the 75 GPM orifices are placed in or out of service by remote operation of the respective letdown orifice isolation valves [EIIS:ISV], 1NV-457A and 1NV-458A. A third parallel letdown path is available (without an orifice) in which valve 1NV-459A serves as a throttle and isolation valve.

Valves 1NV-457A, 1NV-458A, and 1NV-459A are Fisher air operated globe valves model 667-DBQ and close on a Phase A Containment Isolation signal. These valves also automatically close on a low Pressurizer [EIIS:PZR] level signal or by closing valves 1NV-1A or 1NV-2A, Letdown Isolation To Regenerative Heat Exchanger [EIIS:HX]

There are two solenoid [EIIS:SO] valves in the air supply line to the actuator for valve 1NV-459A. One solenoid valve receives an actuation signal from train A of the Solid State Protection system [EIIS:JF] and the other solenoid valve receives an actuation signal from Train B. On initiation of a Containment Isolation signal, the solenoid valves will be deenergized and this action will isolate the air supply to the actuator for valve 1NV-459A, and vent the air pressure in the air supply line which will allow valve 1NV-459A to fail to the closed position. Technical Specification 3.6.3 requires that valve 1NV-459A be capable of closing within 15 seconds of a Containment Isolation signal.

Instrument Detail drawings are prepared by Design Engineering personnel and show the configuration of the component parts, tubing, and connections for instrumentation and control components. Construction personnel used these drawings to determine the configuration of components while installing the instrumentation or control component.

Description of Event

On March 30, 1989, in accordance with Work Request No. 137545 Instrumentation and Electrical (IAE) personnel inspected the air supply configuration for valve 1NV-459A. It was discovered that the nonsafety related valve positioner was installed between the safety related solenoids and the valve actuator. In this configuration it could not be assured that valve 1NV-459A would fail closed as required from a Containment Isolation signal. On April 3, 1989 IAE personnel initiated a Problem Investigation Report to document the incorrect air supply configuration.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

On April 10, 1989, IAE personnel completed Work Request No. 137545 which included the installation of a Fisher model 3582 valve positioner and the retubing of the air supply lines so that the nonsafety related valve positioner would not be between the solenoids and the valve actuator. WR 137545 was done in conjunction with McGuire Exempt Variation Notice (MEVN) 1795 initiated by Project Services personnel.

Conclusion

This event is assigned a cause of Design Deficiency because the valve positioner for valve INV-459A was installed in the wrong configuration as described by the incorrect Instrument Detail drawing during initial construction of Unit 1. The functional mechanical design of the air control system was deficient because the solenoid valves must be able to fail the air supply to valve INV-459A to ensure the valve closes when required. With the solenoid valves positioned prior to the valve positioner in the control system, the solenoid valves will fail the air supply to the positioner but the positioner may not close the valve as required. With the solenoid valves between the positioner and the actuator, the solenoid valves will fail the air supply to the actuator directly and the valve will close as required. The solenoid valves are qualified for the environmental and seismic conditions necessary to be classified as Quality Assurance (QA) Condition 1 (Nuclear Safety Related); the valve positioner is not qualified as QA Condition 1.

The Instrument Detail drawings for valve INV-459A were drafted by Design Engineering personnel and released for use by Construction personnel on April 27, 1978. The Design Engineering person that developed the Instrument Detail drawings for valve INV-459A stated that he might have believed that the valve positioner was qualified as QA Condition 1. However, he stated that he could not remember specifically doing the design work for valve INV-459A.

Also discovered during the investigation of this event was a discrepancy between the as built conditions and Instrument Detail drawing MC-1499-N.63 Rev 3B. In 1986, a Design Engineering person no longer employed by Duke Power Company referenced Manufacturers drawing MCM-1205-06-0249, which showed the valve positioner to be a Fisher Model 3590, which is a combination valve positioner and electronic to pneumatic (E/P) converter. The Design Engineer erroneously thought that was the correct as built conditions, and changed Instrument Detail drawing MC-1499-N.63 and Instrument and Control list MCINVEP4590 for valve INV-459A. This change was made during the design work for Nuclear Station Modification (NSM) MG-1-1159, which was performed to add throttling capability for valve INV-459A from the Auxiliary Shutdown Panel. Project Services personnel initiated MEVN 1795 which included revising the drawings associated with valve INV-459A to the correct as built conditions. MEVN 1795 was completed by Design Engineering personnel on June 27, 1989.

On August 8, 1988, the NRC issued Generic Letter 88-14 concerning the reliability of air supplies to safety related components. As a result of this letter, IAE personnel inspecting valve INV-459A paid particular attention to the air supply configuration for valve INV-459A and discovered the event. The corresponding valve for Unit 2, valve 2NV-459A, does not have the same type components and is installed with the valve positioner in the correct configuration.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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McGuire Nuclear Station, Unit 1	0500036989	006	0	104	OF	04

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

A review of McGuire LERs over the past 12 months revealed one other event, LER 369/88-28 of a Technical Specification violation caused by a design functional deficiency. LER 369/88-28 documented misplaced solenoid valves on the Main Steam bypass valves. Therefore this event is considered recurring.

As a result of LER 369/88-28, Design Engineering personnel initiated a study of all air operated valves at McGuire that have QA condition 1 solenoid valves in the air control system. The review did not discover the problem with valve 1NV-459A because the review for valve 1NV-459A consisted of a review of the Instrument Detail drawing. The Instrument Detail drawing had been changed erroneously by Design Engineering personnel.

LER 369/89-07 concerned misplaced solenoid valves because of a Material Deficiency in Design selection. This problem is considered recurring.

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

There were no personnel injuries radiation overexposures, or releases of radioactive material as a result of this event.

CORRECTIVE ACTIONS:

Immediate: None

Subsequent: WR No. 137545 was completed on April 10, 1989 by IAE personnel to retube the air supplies to valve 1NV-459A to the correct safety related configuration.

Planned: None

SAFETY ANALYSIS:

Valve 1NV-459A is required to close on initiation of a Containment Isolation signal and also on a low Pressurizer level signal. During an event that would require a Containment Isolation, if valve 1NV-459A failed to close as required, Control Room [EIIIS:NA] Operations personnel would have indications in the Control Room that valve 1NV-459A had not closed. Emergency procedures direct Control Room Operators to verify that Containment Isolation valves are closed. OPS personnel would then take action to close upstream valves 1NV-1A and 1NV-2A, Letdown Isolation to Regenerative Heat Exchanger; and with valve 1NV-7B, Letdown Outside Containment Isolation, would restore containment integrity and mitigate the consequences of valve 1NV-459A failing to close as required.

This event did not affect the health and safety of the public.