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December 17, 1990

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 369/90-31

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a)(1) and (d), attached is Licensee Event Report 369/90-31 concerning both trains of the Control Room Ventilation being inoperable because of a natural cause. This report is being submitted in accordance with 10 CFR 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,

Tony L. McConnell

T.L. McConnell

DVE/ADJ/cbl

Attachment

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1): McGuire Nuclear Station, Unit 1
DOCKET NUMBER (2): 0 5 0 0 0 0 3 6 9
PAGE (3): 1 OF 6

TITLE (4): Both Trains Of The Control Room Ventilation System Were Inoperable Because Of A Natural Cause

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		
1	1	1990	90	031	00	12	12	1990	McGuire, Unit 2		
									DOCKET NUMBER(S): 0 5 0 0 0 0 3 7 0		
									0 5 0 0 0 0		

OPERATING MODE (9): 5
 POWER LEVEL (10): 0 0 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 50.73. Check one or more of the following: (11)

<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.406(e)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)
<input type="checkbox"/> 20.406(a)(1)(iii)	<input type="checkbox"/> 50.36(a)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)
<input type="checkbox"/> 20.406(a)(1)(iv)	<input type="checkbox"/> 50.36(a)(2)	<input type="checkbox"/> 50.73(a)(2)(vi)	OTHER (Specify in Addendum, Drawings and in Text, NRC Form 308A)
<input type="checkbox"/> 20.406(a)(1)(v)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(vii)(A)	
<input type="checkbox"/> 20.406(a)(1)(vi)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(vii)(B)	
<input type="checkbox"/> 20.406(a)(1)(vii)	<input type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12):

NAME: Alan Sipe, Chairman, McGuire Safety Review Group
 TELEPHONE NUMBER: 704 875-4183

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRRDS

SUPPLEMENTAL REPORT EXPECTED (14): YES (If yes, complete EXPECTED SUBMISSION DATE) NO

EXPECTED SUBMISSION DATE (15): MONTH: DAY: YEAR:

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

On November 16, 1990, at 1150, Operations (OPS) personnel declared Train B of the Control Room Ventilation (VC) system inoperable. The VC system had failed to start following an Engineered Safety Features (ESF) Actuation Test on Unit 2. Train A of the VC system was already inoperable because of required system alignments needed for the ESF test. This placed Unit 1 in Technical Specification (TS) 3.0.3 because the unit was in Mode 1 (Power Operation). Unit 2 was in Mode 5 (Cold Shutdown). Instrument and Electrical (IAE) personnel discovered a differential pressure switch was not sensing the pressure required to indicate flow and provide a start permissive for the VC system Train B. IAE personnel replaced the pressure switch and noted that the hi side impulse line for this pressure switch was clogged. Maintenance personnel replaced a section of the impulse line including the instrument isolation valve. OPS personnel aligned Train A of the VC system to make it operable and exited TS 3.0.3 on November 16, 1990, at 1340. This event is assigned a cause of Natural Cause due to the quality of the water used by the cooling water system. A raw water task force is presently studying ways of improving the water quality in cooling water systems which use Lake Norman as a source of water.

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

EVALUATION:

Background

The Control Area Ventilation (VC) [EIIS:VI] and Chilled Water (YC) [EIIS:KM] systems are designed to maintain the environment in the Control Room [EIIS:NA], Control Room Area, and Switchgear [EIIS:SWGR] Room, within acceptable limits for safe occupancy of the Control Room during plant operations and following post accident shutdown. Based on these criteria, the system is designed as an Engineered Safety Features (ESF) system with absolute and carbon filtration in the outside air intakes and with equipment redundancies for use as conditions require.

Two 100 percent redundant air handling systems are provided for the Control Room, Switchgear Rooms, and the Control Room Area (equipment rooms, cable [EIIS:CBL] room, battery [EIIS:BY] room, etc.). The air handling units [EIIS:AHU] are provided with chilled water from the YC system. The Nuclear Service Water (RN) [EIIS:BI] system provides the cooling water for the chiller condenser [EIIS:COND] on the YC system. Two Control Room pressurization fans [EIIS:FAN] and filter [EIIS:FLT] trains are provided for pressurization of the Control Room, to prevent entry of dust, dirt, smoke, radioactivity, etc., originating outside the Control Room. Air filtration is provided by prefilters on all air handling units. Instruments are provided for temperature control and indication, and to indicate radioactivity levels. Smoke alarms [EIIS:ALM] are also provided.

Technical Specification (TS) 3/4.7.6 includes requirements that in Mode 1 (Power Operation), Mode 2 (Startup), Mode 3 (Hot Standby), and Mode 4 (Hot Shutdown), with one train of the VC/YC system inoperable, the inoperable train must be restored to operable status within seven days or be in at least Hot Standby within the next six hours, and in Cold Shutdown within the next thirty hours. With both trains of VC/YC system inoperable, with the unit in Mode 1, the specified action is to comply with TS 3.0.3. TS 3.0.3 requires that within 1 hour action must be initiated to place the unit in a Mode in which the TS does not apply. TS 3.7.6 applies to Unit 1 and Unit 2 because the VC/YC system is shared. TS 3.7.6 also includes requirements that in Mode 5 (Cold Shutdown), and Mode 6 (Refueling), with both trains of the VC/YC system inoperable, core alterations or positive reactivity changes must be suspended.

Description of Event

On November 15, 1990, Operations (OPS) personnel were aligning plant equipment in preparation for assisting Performance (PRF) personnel in performing procedure PT/2/A/4200/09A, ESF Actuation Periodic Test. This procedure demonstrates the ability of plant equipment to respond to ESF actuation signals. To perform the Train A portion of the ESF test, OPS personnel were required to have the power supply [EIIS:JX] and water supply for the VC/YC system aligned to Unit 2. Each train of the VC/YC system can be aligned to either Unit 1 or Unit 2.

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TEXT (if more space is required) Use NRC Form 366A (17)

RN s; .em Train A was in service but was technically inoperable because of various outage related work requests (WRs) which had been performed. The work had been completed, but the paperwork had not been signed off to allow OPS personnel to declare the RN system Train A operable per TS.

OPS personnel declared the VC/YC system Train A inoperable on November 15, 1990, at 2130, and aligned the power and water supplies for the VC/YC system to Unit 2. Train A was aligned in standby, and Train B was in service as specified in the ESF test procedure.

OPS and PKF personnel performed the Train A portion of the ESF test on the morning of November 16, 1990. At the conclusion of this test, OPS personnel were realigning the plant equipment to normal. The ESF test had started the VC/YC system Train A and secured Train B as was expected. Train B would not restart when OPS personnel attempted to swap the operating VC/YC system train.

OPS personnel declared Train B of the VC/YC system inoperable on November 16, 1990, at 1150. Since Train A was already inoperable, this placed Unit 1 in TS 3.0.3 because both of the VC/YC system trains were now inoperable and Unit 1 was in Mode 1.

OPS personnel entered procedure AP/0/A/5500/39, Control Room Hi Temperature, in response to the loss of Control Room ventilation on November 16, 1990, at 1206.

OPS personnel issued an emergency WR, number 143480, to investigate and repair the cause of the Train B VC/YC system not starting. Instrument and Electrical (IAE) personnel discovered the differential pressure switch [EIIS:PDS], ORNPS-6150, which indicates RN system flow through the Train B YC system condenser, not sensing flow. Pressure switch ORNPS-6150 provides a start permissive for the VC/YC system Train B.

OPS personnel failed valve [EIIS:V] 1RN-460, Train B VC/YC Chiller Nuclear Service Water Supply, to the fully open position and started the Train B RN pump [EIIS:P] to ensure adequate RN flow to the Train B YC system condenser at 1209. OPS personnel then started the Train B VC/YC system after being informed by IAE personnel that pressure switch ORNPS-6150 was indicating flow to the chiller condenser. After the VC/YC unit started, OPS personnel secured performance of the Control Room Hi Temperature procedure at 1231.

The power supply and RN supply to the Train A of the VC/YC system were aligned to Unit 1 at 1325, by OPS personnel. Train A was then started and declared operable by OPS personnel. This enabled the unit to exit TS 3.0.3 on November 16, 1990, at 1340.

IAE personnel replaced pressure switch ORNPS-6150 and OPS personnel restored valve 1RN-460 to normal operation. While IAE personnel were replacing the pressure switch they discovered that the hi pressure side impulse line to the instrument was blocked. Attempts to remove this blockage were unsuccessful.

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McGuire Nuclear Station, Unit	0500036990	031	0		4 OF 6	

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

OPS and IAE personnel decided to install a jumper across the contacts for pressure switch ORNPS-6150 to bypass the start interlock function of this pressure switch. This temporary modification (temp mod) was documented in the Temporary Modification Log Book as number 6104 and also documented on WR 143480. Sufficient RN system flow through the chiller condenser had been verified by OPS personnel. OPS personnel declared Train B of the VC/YC system operable on November 17, 1990, at 1400, after starting the unit to ensure it would operate properly.

Maintenance (MNT) personnel replaced the section of impulse line, including the isolation valve, that contained the blockage on November 28, 1990.

Conclusion

This event is being assigned a cause of Natural Cause. The RN system receives water from either Lake Norman [E11S:BS] or from the Standby Nuclear Service Water pond, both of which are raw water sources. The hi pressure side impulse line for differential pressure switch ORNPS-6150 was blocked by a combination of rust and mud. This blockage prevented the pressure switch from sensing sufficient differential pressure to allow the start interlock for Train B of the VC/YC system to be energized. RN system flow was passing through the chiller condenser but the differential pressure switch was not sensing the flow due to the blockage in the impulse line. This blockage prevented the Train B VC/YC system from starting. IAE personnel replaced the differential pressure switch and MNT personnel replaced the section of the impulse line that contained the blockage. IAE personnel will revise the preventative maintenance WRs for safety related RN instruments to require the IAE technicians to disconnect and bleed the impulse lines to ensure the lines are not blocked. A raw water task force is currently studying ways to improve the quality of the water in the RN system. This task force began the study prior to this event mainly because of problems with mud buildup in heat exchangers using RN system water.

A review of the Operating Experience Program data base for the previous 24 months prior to this event revealed no LERs with TS 3.0.3 entries caused by Natural Causes; however, LER 369/89-18 described an event where the RN supply valve to the VC/YC chiller failed to open. The corrective action for this LER was specific to that event. Entry into TS 3.0.3 caused by the VC/YC system is recurring; thus, the problem is considered to be recurring.

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

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

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

CORRECTIVE ACTIONS:

- Immediate:
- 1) OPS personnel implemented procedure AP/0/A/5500/39, Control Room Hi Temperature.
 - 2) OPS personnel issued emergency WR number 143480 to repair the cause of Train B VC/YC not starting.
- Subsequent:
- 1) OPS personnel started Train B of the RN system and failed valve 1RN-460, Train B VC/YC Chiller RN Water Supply, to the open position to ensure RN flow to the chiller condenser.
 - 2) OPS personnel started Train B of the VC/YC system after being informed by IAE personnel that pressure switch ORNPS-6150 was indicating RN flow to the chiller condenser.
 - 3) OPS personnel started Train A of the VC/YC system after aligning it to Unit 1.
 - 4) IAE personnel replaced differential pressure switch ORNPS-6150 per WR 143480 and discovered the hi pressure impulse line blocked.
 - 5) IAE personnel placed a jumper across the start interlock contacts from pressure switch ORNPS-6150 to the Train B VC/YC system and documented this jumper as number 6104 in the Temporary Modification Logbook and on WR 143480.
 - 6) MNT personnel replaced the blocked portion of the instrument tubing on pressure switch ORNPS-6150.
- Planned:
- IAE personnel will revise the preventative maintenance WRs for Safety Related RN instruments to require the IAE technicians to disconnect and bleed the impulse lines to ensure the lines are not blocked.

SAFETY ANALYSIS:

The design requirements of the VC system are to supply filtered air at a controlled temperature and humidity to the Control Room and to pressurize the Control Room to prevent inleakage of unfiltered air. The VC system helps ensure that doses to Control Room personnel are As Low As Reasonably Achievable and in the event of a design basis accident, the VC system acts to limit Control Room operator dose to less than the General Design Criterion 19 limits, i.e., less than 5 Rem whole body or its equivalent. Since whole body doses are primarily due to exposure to noble gases which the filters do not remove, the VC system is not required to ensure acceptable whole body doses.

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McGuire Nuclear Station, Unit 1	0600036990	0	3	1	0	6

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

However, the VC system reduces thyroid and skin doses by pressurizing the Control Room with filtered air to minimize unfiltered in-leakage.

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

No credit is taken for the VA filtration, with regard to Control Room dose calculation, in mitigating the Emergency Core Cooling System leakage source. However, this system is automatically switched to the filtered exhaust mode of operation on an accident or Blackout signal or if radiation is detected by the exhaust monitor [EIIS:MON]. The VA system has four 50 percent capacity trains for Units 1 and 2 which respond to an accident on either unit thus providing essentially redundant protection. Operation of the VA system in the filtered exhaust mode by either train of the system would serve to reduce the calculated dose to Control Room personnel.

In the event the Control Room atmosphere became unbreathable, self contained breathing apparatus (SCBAs) 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 event when both trains of VC/YC were declared inoperable, OPS personnel implemented procedure AP/O/A/5500/39, Control Room Hi Temperature, which ensured Control Room temperature did not exceed 120 degrees-F as specified in TS 3/4.7.6.

Train A of the VC/YC system was technically inoperable but was fully capable of operating. OPS personnel immediately initiated corrective actions to restore both trains of the VC/YC system to an operable condition.

During the event, there were no accidents that would have required operation of the VC/YC system to maintain habitability of the Control Room.

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