

July 28, 2005

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

Subject: McGuire Nuclear Station, Unit 2
Docket No. 50-370
Licensee Event Report 370/2005-06, Revision 0
Problem Investigation Process (PIP) M-05-01794

Pursuant to 10 CFR 50.73, Sections (a)(1) and (d), attached is Licensee Event Report (LER) 370/2005-06, Revision 0, concerning failure of Containment Floor and Equipment (CFAE) sump discharge outside containment isolation valve 2WL-65B to fully close on McGuire Unit 2.

This report is being submitted in accordance with 10 CFR 50.73 (a) (2) (i) (B), as an operation prohibited by Technical Specifications. In addition, there were several periods when CFAE sump discharge inside containment isolation valve, 2WL-64A, and 2WL-65B were simultaneously inoperable. Therefore, this event is also being reported as a condition which could have prevented fulfillment of a safety function in accordance with the requirements of 10CFR50.73(a)(2)(v)(C).

This event is determined to be of no significance to the health and safety of the public. There are no regulatory commitments contained in the LER.


G. R. Peterson

Attachment



U. S. Nuclear Regulatory Commission
July 28, 2005
Page 2 of 2

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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 and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet e-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently

1. FACILITY NAME McGuire Nuclear Station, Unit 2	2. DOCKET NUMBER 05000 370	3. PAGE 1 OF 5
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4. TITLE
Failure of Containment Floor and Equipment (CFAE) sump discharge outside containment isolation valve to fully close.

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
06	09	2005	2005	- 006 -	00	07	28	2005	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE 1	10. POWER LEVEL 100	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)								
		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)	50.36(c)(2)	50.73(a)(2)(v)(B)						
		20.2203(a)(2)(iii)	50.46(a)(3)(ii)	X 50.73(a)(2)(v)(C)						OTHER 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 Reza Djali, Regulatory Compliance	TELEPHONE NUMBER (Include Area Code) 704-875-4228
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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
B	WD	ISV	G257	YES					

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

16. ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)
Unit Status: At the time of the event, Unit 1 was in Mode 1 (Power Operation) at 100 percent power and Unit 2 was in Mode 1 at 100 percent power.

Event Description: On June 9, 2005, 2WL-65B Containment Floor and Equipment (CFAE) sump discharge outside containment isolation valve (CIV), was determined to be inoperable. 2WL-65B had failed penetration Local Leak Rate Testing (LLRT) during Refueling outage in April 2005. In addition, there were several periods when 2WL-64A (CFAE sump discharge inside CIV) and 2WL-65B were simultaneously inoperable. This event is reportable as a condition prohibited by Technical Specifications and a condition which could have prevented fulfillment of a safety function. This event was not significant with respect to the health and safety of the public.

Event Cause: The Apparent Cause of this event is attributed to 2WL-65B's unique design and lack of understanding as to how manual operation of a diaphragm valve equipped with a Rotork Actuator can adversely affect the component.

Corrective Action: 2WL-65B's actuator limit switch was readjusted and a successful penetration LLRT was performed. Transportability Analysis determined that 2WL-65B's failure mode is transportable to 15 other valves; 7 on Unit 1 and 8 on Unit 2. A review of valve stroke timing records for these valves confirmed that the valves were operable. Additional corrective actions have been planned to improve operator knowledge and reliability of valves' performance.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE	
McGuire Nuclear Station, Unit 2	05000370	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2	OF 5
		2005	- 005	- 00		

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

BACKGROUND

Applicable Energy Industry Identification (EIIS) system and component codes are enclosed within brackets. McGuire unique system and component identifiers are contained within parentheses.

Containment Floor and Equipment (CFAE) sump discharge containment isolation valve [WD] (WL):

The Unit 2 CFAE sump discharge containment isolation valve, 2WL-65B, is part of the Liquid Waste System [WD] (WL). 2WL-65B is located on the discharge side of the CFAE sump pumps outside containment. 2WL-65B is normally closed and is remotely opened to allow pump out of the CFAE sump to the Liquid Waste system [WD] (WL) for processing. CFAE sump discharge inside containment isolation valve, 2WL-64A, is normally open. Both valves are interlocked with the CFAE Sump pumps and Incore Instrumentation Sump pumps such that the pumps can not be started unless the valves are opened, and the pumps will trip if any of these valves should close. The safety function performed by these valves is to close upon receipt of Phase A containment isolation signal (Engineered Safety Feature). The penetration flow path for 2WL-64A and 2WL-65B contains a loop seal that satisfies containment integrity requirements during core alterations. 2WL-64A and 2WL-65B are Grinnell Diaphragm valves (model 05B-153) with a Rotork electrical actuator (model 11NA1-57).

McGuire Technical Specification (TS) 3.6.3 - Containment Isolation Valves:

TS 3.6.3 specifies that each containment isolation valve shall be operable in Modes 1, 2, 3, and 4. TS Surveillance Requirement (SR) 3.6.3.5 and associated test acceptance criteria indicate that a containment isolation valve is operable when it is capable of closing within limits. 2WL-65B is required to close in less than or equal to 15 seconds upon receipt of an isolation signal. As per TS 3.6.3, Condition A, if one containment isolation valve is inoperable, the affected penetration flow path shall be appropriately isolated within 4 hours and verified to be isolated once per 31 days and prior to entering Mode 4 from Mode 5 if not performed within the previous 92 days for isolation devices inside containment. If the required action and associated completion time of Condition A are not met, then TS 3.6.3, Condition F, states that the respective Unit must be in Mode 3 within 6 hours and in Mode 5 within 36 hours. As per TS 3.6.3, Condition B, if both containment isolation valves are inoperable, the affected penetration flow path shall be appropriately isolated within 1 hour. If the required action and associated completion time of Condition B are not met, then TS 3.6.3, Condition F, states that the respective Unit must be in Mode 3 within 6 hours and in Mode 5 within 36 hours.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
McGuire Nuclear Station, Unit 2	05000370	2005	- 005	- 00	3 OF 5

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

McGuire TS 3.8.1 AC Source-Operating

TS 3.8.1 specifies that two diesel generators (DGs), capable of supplying the onsite Essential Auxiliary Power Systems, shall be operable in Modes 1, 2, 3, and 4. With one DG inoperable, required action B.2 specifies that the required feature(s) supported by the inoperable DG shall be declared inoperable when its required redundant feature(s) is inoperable. The completion time for required action B.2 is within 4 hours from discovering that one DG is inoperable concurrent with inoperability of redundant required feature(s).

EVENT DESCRIPTION

Note: All events are shown in the approximate sequence in which they occurred.

- On September 29, 2003, 2WL-65B was manually cycled to allow pump out of the CFAE sump while power to its actuator was not available due to scheduled maintenance during a Unit 2 refueling outage (2EOC15). Subsequent to power restoration, 2WL-65B was cycled electrically to ensure proper operation.
- On April 1, 2005 while in Mode 6 during refueling outage 2EOC16, mechanical penetration M-374, containing both 2WL-64A and 2WL-65B, failed its Local Leak Rate Test (LLRT).
- On April 4, 2005 while in Mode 5, subsequent investigation identified that 2WL-65B had failed its LLRT. The valve's actuator was adjusted and a successful LLRT was performed.
- On June 9, 2005, Engineering investigation concluded that 2WL-65B was inoperable from the time the valve was manually cycled until when the valve was restored to operable status on April 4, 2005. This conclusion was based, in part, on an observed step change in valve stroke that corresponded to the time 2WL-65B was manually cycled.

Since 2WL-65B was inoperable for a period longer than allowed by TS, this condition represents an operation prohibited by Technical Specifications and is reportable per the requirements of 10 CFR 50.73 (a)(2)(i)(B). Although a loss of safety function did not actually occur, this condition is also reportable per 10 CFR 50.73 (a)(2)(v)(C) as a condition that reasonably could have prevented fulfillment of a safety function. This is because 2WL-65B's normally open redundant feature, 2WL-64A, was inoperable per TS 3.8.1 since it would not have automatically closed assuming a loss of offsite power. Loss of offsite power is assumed to occur concurrent with 2WL-65B's inoperability and inoperability of the 2A D/G due to planned maintenance.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE	
McGuire Nuclear Station, Unit 2	05000370	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4	OF 5
		2005	- 005	- 00		

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

CAUSAL FACTORS

The Apparent Cause of this event is attributed to 2WL-65B's unique design and lack of understanding as to how manual operation of a diaphragm valve equipped with a Rotork Actuator can adversely affect the component. Diaphragm valves such as 2WL-65B do not have positive stops to give manual operators the feel for a fully opened valve. Although the Rotork actuator has a clutch in the limit switch screwed spindle to maintain limit switch settings, continued manual operation beyond the fully open position can challenge the clutch and may result in inadvertently resetting the limit switches such that the valve may not fully close.

Transportability Analysis determined that the failure mode for 2WL-65B is transportable to 15 other valves; 7 on Unit 1 and 8 on Unit 2. Historical data from the last successful LLRT were reviewed in order to determine if any of the affected valves had been manually manipulated until present time. This data showed that none of the 15 valves had been manually manipulated with a corresponding step change in valve stroke times. All stroke times were consistently within limits. Note that manual cycling of the valves would show as much longer valve stroke times on the Operator Aid Computer (OAC). However, the OAC showed acceptable stroke times for all 15 valves. This confirmed that the remaining valves are operable.

CORRECTIVE ACTIONS

Immediate:

- 2WL-65B was repaired by adjusting the primary limit switches internal to its Rotork actuator.

Subsequent:

- Initiated Apparent Cause investigation to better understand the failure mechanism on 2WL-65B.
- Removed Rotork motor operated diaphragm containment isolation valves from extended test interval program allowed under 10CFR50 Appendix J Option B until a process is in place to properly document manual operation of these valves and until operators are properly trained on the unique design and the impact of manually operating these valves.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE	
McGuire Nuclear Station, Unit 2	05000370	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	5	OF 5
		2005	- 005	- 00		

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

Planned:

- Develop training material and communicate design limitations of manual operation of diaphragm Motor Operated Valves with appropriate station personnel.
- Modify appropriate station programs and/or procedures to warn against continued manual valve operation beyond full open position.
- Evaluate physical plant modification(s) to improve reliability of valves' performance. The modification(s) may replace the actuator(s) with a type that is not vulnerable to improper manual operation.

SAFETY ANALYSIS

Failure of 2WL-65B would have prevented isolation of mechanical penetration M-374 outside of containment as a result of a phase A containment isolation signal. Inside containment isolation valve 2WL-64A was assumed to be open during this event and incapable of isolating this penetration flow path.

Engineering performed a containment sump inventory diversion evaluation during accident conditions and determined the inventory loss to be insignificant. Considering the above assumptions and pre-existing containment leakage, a review of this event determined that there is no impact on either the estimated core damage frequency (CDF) or large early release frequency (LERF). Therefore, the event described in this LER was not significant with respect to the health and safety of the public.

ADDITIONAL INFORMATION

A review of the McGuire corrective action database did not identify any other events within the past three years having similar circumstances, cause, and corrective actions. Therefore, the event described in this LER is not considered a recurring event.