

May 2, 2005

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

Subject: McGuire Nuclear Station, Unit 1 and Unit 2
Docket No. 50-369, 50-370
Licensee Event Report 369/2005-01, Revision 0

Pursuant to 10 CFR 50.73, Sections (a)(1) and (d), attached is Licensee Event Report (LER) 369/2005-01, Revision 0.

On March 2, 2005, McGuire Nuclear Station identified past instances where, with regard to the Reactor Coolant System leakage detection function, both Unit's EMF38L and EMF39L Containment Atmosphere Radiation Monitors were inoperable for a period longer than permitted by plant Technical Specifications. These instances represented an operation prohibited by Technical Specifications reportable as per the requirements of 10 CFR 50.73 (a)(2)(i)(B).

A qualitative risk assessment has determined this event to be of no significance to the health and safety of the public. There are no regulatory commitments contained in this LER.



G. R. Peterson

Attachment

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U. S. Nuclear Regulatory Commission

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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 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 McGuire Nuclear Station, Unit 1	2. DOCKET NUMBER 05000 369	3. PAGE 1 OF 6
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4. TITLE
Reactor Coolant System Leakage Detection Instrumentation Inoperable

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
12	15	2004	2005	001	00	05	02	2005	McGuire Nuclear Station, Unit 2	05000 370
									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)	OTHER Specify in Abstract below or in NRC Form 366A					
		20.2203(a)(2)(iii)	50.46(a)(3)(ii)	50.73(a)(2)(v)(C)						
		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 Julius W Bryant, Regulatory Compliance	TELEPHONE NUMBER (Include Area Code) 704-875-4162
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

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 and Unit 2 were in MODE 1 (Power Operation) at 100 percent power.

Event Description: On December 15, 2004, an initial evaluation of the adequacy of the radioactivity detection sensitivities of both Unit's Containment Atmosphere Particulate Radioactivity Monitor (EMF38L) and both Unit's Containment Atmosphere Gaseous Radioactivity Monitor (EMF39L) concluded these EMFs were operable. However, on March 2, 2005, McGuire concluded the sensitivities of these EMFs were inadequate for them to perform their intended function of detecting a one gallon per minute leak from the Reactor Coolant System within one hour. In consequence, with regard to the Reactor Coolant System leakage detection function, these monitors were inoperable for periods in excess of Technical Specification requirements. These instances represented a Technical Specification prohibited operation reportable under the requirements of 10 CFR 50.73 (a) (2) (i) (B). A risk assessment has determined this event to be of no significance to the health and safety of the public.

Event Cause: The initial evaluation of EMF38L and EMF39L did not recognize that, even though their sensitivities appeared to comply with original licensing basis requirements, current Reactor Coolant System radioactivity levels precluded EMF38L and EMF39L from satisfying their intended function of detecting a one gallon per minute Reactor Coolant System leak within one hour.

Corrective Action: Additional training will be conducted related to what is to be addressed when evaluating the capability of a structure, system, or component to perform its specified function(s). License Amendment Request will be submitted clarifying the capabilities of the RCS leakage detection instrumentation.

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

BACKGROUND

Reactor Coolant System (RCS) Leakage Detection Instrumentation [IL](EMF):

The purpose of the RCS leakage detection instrumentation is to provide a high degree of confidence that extremely small RCS leaks are detected in time to allow actions to place the Unit in a safe condition. Redundancy is provided by the use of diverse monitoring methods. Two of these methods are the Containment Atmosphere Particulate Radioactivity Monitor (EMF38L) and the Containment Atmosphere Gaseous Radioactivity Monitor (EMF39L). Another is the Containment Ventilation Condensate Drain Tank (VUCDT) Level Monitor.

The original licensing basis radioactivity detection sensitivities of EMF38L and EMF39L were established based upon guidance provided in NRC Regulatory Guide (RG) 1.45 - Reactor Coolant Pressure Boundary Leakage Detection. RG 1.45 indicates that, when analyzing the sensitivity of leak detection systems using particulate or gaseous radioactivity, a realistic RCS radioactivity concentration assumption should be used. With regard to this assumption, RG 1.45 states that the expected values used in the Plant Environmental Report (PER) would be acceptable for use. Based upon the guidance provided in RG 1.45 and the expected radioactivity values provided in the McGuire PER, the original licensing basis radioactivity detection sensitivity of each Unit's EMF39L was established assuming an RCS radioactivity concentration based upon a 0.1 percent failed fuel assumption. Using this same RG 1.45 guidance, the original licensing basis radioactivity detection sensitivity of each Unit's EMF38L was established assuming an RCS radioactivity concentration based upon corrosion product activities shown in Table 11-4 of the McGuire UFSAR.

McGuire Technical Specification (TS) 3.4.15 - RCS Leakage Detection Instrumentation:

The EMF38L and EMF39L RCS leakage detection functions are ensured by compliance with the applicable requirements of TS 3.4.15. The TS 3.4.15 LCO states that EMF39L and either the EMF38L or VUCDT level monitor are to be operable in MODES 1, 2, 3, and 4. As per TS 3.4.15, Condition B, if EMF39L is inoperable, either analyze grab samples of the respective Containment's atmosphere once per 24 hours or perform an RCS water inventory balance once per 24 hours. As per TS 3.4.15, Condition C, if both EMF38L and the VUCDT Level Monitor are inoperable, either restore EMF38L to operable status within 30 days or restore the VUCDT Level Monitor to operable status within 30 days. If the required actions and completion times of Condition B or C are not met, TS 3.4.15 Condition D states that the applicable Unit shall be in MODE 3 within 6 hours and in MODE 5 within 36 hours. Note that the TS 3.4.15 BASES states that, when the VUCDT Level Monitor is used as a RCS leakage detection method, manual hourly logging of the VUCDT level is required to satisfy the TS 3.4.15 LCO requirements.

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

EVENT DESCRIPTION

Timeline:

November 19, 2004 > McGuire became aware of industry operating experience where a utility had received an NRC non-cited violation related to the inability of a Containment Atmosphere Gaseous Radioactivity Monitor to perform its design basis function of detecting a one gallon per minute leak from the RCS within one hour. The utility attributed this to RCS radioactivity levels lower than those used to establish the original licensing basis radioactivity detection sensitivity of the monitor.

December 15, 2004 > A McGuire evaluation, performed in response to the above operating experience, concluded that each Unit's EMF38L and EMF39L monitors were operable given that, as per RG 1.45 guidance, their sensitivities were established based upon the expected RCS radioactivity values at the time of original licensing.

Note that McGuire recognized that, due to improvements in fuel performance and corrosion products control, McGuire's RCS has lower radioactivity levels than those used to establish the original EMF38L and EMF39L licensing basis sensitivities. However, McGuire concluded that these EMFs were operable since their sensitivities were established using guidance provided in RG 1.45.

February 12, 2005 > As a result of NRC discussions, McGuire implemented conservative actions to perform an RCS water inventory balance on each Unit once per night shift. Although neither Unit's EMF39L had been declared inoperable, performance of this water inventory balance is a TS 3.4.15 required action for an inoperable EMF39L.

Concurrent with the above RCS leakage calculation, as a conservative measure, each Unit's VUCDT level was being manually logged once per 4 hours.

February 24, 2005 > McGuire implemented conservative actions to increase the frequency of manual logging of each Unit's VUCDT level to once per hour. Although neither Unit's EMF38L had been declared inoperable, manual logging of VUCDT level every hour satisfies the TS 3.4.15 LCO requirements whenever EMF38L is inoperable.

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

March 2, 2005 > Subsequent to discussions with the NRC, McGuire concluded that both Unit's EMF38L and EMF39L were inoperable with respect to their RCS leakage detection function. For reporting purposes, this is the event discovery date.

Due to improvements in fuel performance and corrosion product control, there is significantly less radioactivity in the RCS than assumed in the calculations used to establish the original licensing basis EMF38L and EMF39L sensitivities. Given this, both Unit's EMF38L and EMF39L sensitivities were not adequate to allow them to perform their design basis RCS leakage detection function of detecting a one gallon per minute leak from the RCS within one hour. Therefore, even though these sensitivities were established using RG 1.45 guidance, McGuire concluded this condition rendered EMF38L and EMF39L inoperable.

Given the information provided in the above timeline, both Unit's EMF38L and EMF39L Monitors should have been declared inoperable with respect to their RCS leakage detection function for the period between December 15, 2004 (completion of initial evaluation) and March 2, 2005. Note that these EMFs were also inoperable prior to completion of the initial evaluation on December 15, 2004. Given that both Unit's EMF38L and EMF39L were not declared inoperable as required, the applicable required actions and completion times of TS 3.4.15 were not satisfied. This represented an operation prohibited by TS which is reportable as per the requirements of 10 CFR 50.73(a)(2)(i)(B).

CAUSAL FACTORS

The initial evaluation completed on December 15, 2004, did not recognize that, even though the sensitivities of EMF38L and EMF39L appeared to comply with original licensing basis requirements, current RCS radioactivity levels precluded these EMFs from satisfying their intended function of detecting a one gallon per minute RCS leak within one hour.

CORRECTIVE ACTIONS

Completed:

- On March 2, 2005, both Unit's EMF38L and EMF39L were declared inoperable with respect to their RCS leakage detection function. The applicable TS 3.4.15 required actions are being implemented.

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

- Temporary alarm setpoints have been established for both Unit's EMF38L and EMF39L. These setpoints provide an earlier notification to Operators should a significant RCS leak be experienced.
- A Special Order was issued providing directions for monitoring of other diverse methods of RCS leakage detection.

Planned:

- The sensitivity of both Unit's EMF38L will be established as low as practical based upon actual RCS radioactivity levels. These sensitivities will be periodically reviewed and revised as practical and necessary.
- It may not be possible to adjust the sensitivity of EMF38L such that it would be capable of detecting a one gallon per minute leak from the RCS within one hour under all possible RCS activity levels. In addition, due to its design, it is not possible to adjust the sensitivity of EMF39L such that it would be capable of detecting a one gallon per minute leak from the RCS within one hour. Therefore, McGuire will submit a License Amendment Request to clarify the capabilities of the Unit 1 and Unit 2 RCS leakage detection instrumentation as needed.
- Additional training will be conducted related to what is to be addressed when evaluating the capability of a structure, system, or component to perform its specified function(s).

SAFETY ANALYSIS

EMF38L and EMF39L are not modeled in the McGuire Probabilistic Risk Assessment. Therefore, the significance of this event will be assessed qualitatively.

TS 3.4.15 identifies the following separate RCS leakage detection instrumentation systems:

- Containment Floor and Equipment Sump Level Monitor
- EMF39L
- EMF38L and VUCDT Level Monitor.

The BASES for TS 3.4.15 states that the primary method of detecting RCS leakage into the containment is measurement of the Containment Floor and Equipment Sump Level. The BASES also lists other monitoring methods such as containment air temperature and pressure monitoring.

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

Given the redundant RCS leakage detection methods and the absence of significant Unit 1 and Unit 2 RCS leakage, the risk associated with the event was negligible. 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 identified a 1994 event related to the inability of both Unit's EMF38L and EMF39L to detect a one gallon per minute leak from the RCS within one hour (reference LER 369/94-02). However, the circumstances, cause, and corrective actions associated with that event are sufficiently different such that the event described in this LER is not considered a recurring event:

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