

June 14, 2007

U.S. Nuclear Regulatory Commission
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Washington, D.C. 20555

Subject: McGuire Nuclear Station, Unit 1
Docket No. 50-369
Licensee Event Report 369/2007-03, Revision 0
Problem Investigation Process (PIP) M-07-02486

Pursuant to 10 CFR 50.73, Sections (a)(1) and (d), attached is Licensee Event Report (LER) 369/2007-03, Revision 0.

On April 15, 2007, while McGuire Nuclear Station Unit 1 was in Mode 6, core alterations occurred with only one of the two required source range neutron flux monitors operable. Operators were unaware that only one of the source range neutron flux monitors was able to generate an audible high flux at shutdown alarm. The requirement for two source range neutron flux monitors to provide visual count rate indication was met during this period. This report is being submitted in accordance with 10 CFR 50.73 (a)(2)(i)(B) as a condition prohibited by Technical Specifications.

This event was 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

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LICENSEE EVENT REPORT (LER)

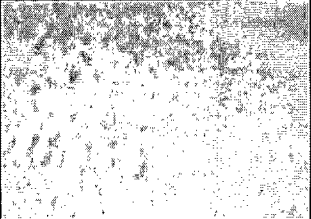
(See reverse for required number of digits/characters for each block)

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 7
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4. TITLE
Inoperable Source Range Neutron Flux Monitors during Mode 6 and Core Alterations.

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
04	15	2007	2007	- 003	- 00	06	14	2007	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE 6	20.2201(b)	20.2203(a)(3)(ii)	50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)
10. POWER LEVEL 000	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 Lee A. Hentz, Regulatory Compliance	TELEPHONE NUMBER (Include Area Code) 704-875-4187
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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

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 6 (Refueling) at 0% power, and Unit 2 in Mode 1 (Power Operation) at 100% power.

Event Description: On April 15, 2007, while Unit 1 was in Mode 6, core alterations occurred with only one of the two required source range neutron flux monitors operable. Operators were unaware that only one of the source range neutron flux monitors was able to generate an audible high flux at shutdown alarm. The requirement for two source range neutron flux monitors to provide visual count rate indication was met during this period. This event, which constitutes an operation prohibited by Technical Specifications, was determined to be of no significance to the health and safety of the public.

Event Cause: The cause of this event was the failure to ensure that the operability requirements of the Gamma-Metrics shutdown monitors were adequately captured in the applicable surveillances and operating procedures when these monitors were credited in Technical Specifications as redundant monitors.

Corrective Actions: Revise applicable procedures with the appropriate operability requirements including the function of the Gamma-Metrics shutdown monitor alarm switch, and place a warning label near each Gamma-Metrics shutdown monitor alarm switch on both Units.

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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.

Nuclear Instrumentation System [IG] (ENB):

The source range neutron flux monitors are used during refueling operations to monitor the core reactivity condition. The installed source range neutron flux monitors are part of the Nuclear Instrumentation System (NIS) [IG] (ENB) and the Wide Range Neutron Flux Monitoring System (Gamma-Metrics). These detectors monitor neutrons leaking from the core. The NIS source range channels are boron tri-fluoride (BF3) detectors while the Gamma-Metrics shutdown monitors are fission chambers. These instruments provide continuous visible count rate indication in the control room and an audible high flux alarm in the control room to alert operators to a possible dilution event. Although not required for operability, the NIS source range channels, N31 and N32, also provide audible indication of count rate in the control room and upper containment near the refueling bridge.

The Gamma-Metrics shutdown monitors were installed by modification in 1994 for additional indication and alarm capability. The Technical Specification Bases was also revised in 1994 to allow crediting the Gamma-Metrics as redundant monitors for Operability purposes.

McGuire Technical Specification (TS) 3.9.3 Nuclear Instrumentation:

TS 3.9.3 requires that two source range neutron flux monitors shall be Operable in Mode 6 to ensure redundancy. The two required source range neutron flux monitors may consist of a combination of NIS source range channels and Gamma-Metrics shutdown monitors. For an instrument to be Operable, it must provide a continuous visible count rate indication in the control room and an audible high flux control room alarm.

Per TS 3.9.3 Condition A, with only one required source range neutron flux monitor operable, redundancy has been lost. Since these instruments are the only direct means of monitoring core reactivity conditions, core alterations and introduction of coolant into the reactor coolant system with boron concentration less than required to meet the minimum boron concentration must be suspended immediately.

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BACKGROUND (continued)

LER 369/2005-05 (PIP M-05-04437)

On September 21, 2005, while Unit 1 was in Mode 6, all source range neutron monitors became inoperable when annunciator alarm circuitry failed. Subsequently, on September 22, 2005 core alteration activities commenced with these monitors inoperable. The inability of the required source range monitors to generate an audible high flux at shutdown alarm was not discovered until September 23, 2005. All other control room source range neutron flux indications were functioning properly during this period. This activity represented an operation prohibited by McGuire's Technical Specifications.

The causes of this event were attributed to an inadequate Operator Aid Computer (OAC) alarm response procedure, and the common alarm circuitry of the high flux at shutdown alarm.

EVENT DESCRIPTION

At the time of this event, Unit 1 was in Mode 6, refueling operations, and Unit 2 was in Mode 1 at 100% power.

On March 23, 2007, Unit 1 core unload commenced.

During core unload, as directed by the Internal Transfer Development procedure, PT/0/A/4150/048, both Gamma-Metrics shutdown monitor's alarm switches were placed in "BYPASS" when the respective neutron flux count rate decreased to below 0.2 counts per second (cps) after the fuel assembly had been removed from in front of the monitor. This is necessary to preclude nuisance alarms in the control room from low count rate or background noise. At this time, both NIS source range channels were Operable.

On March 25, 2007, Unit 1 core unload was completed.

On April 15, 2007, Unit 1 core reload commenced with both Gamma-Metrics shutdown monitor's alarm switches still in "BYPASS." At this time, both NIS source range channels were Operable.

During core reload, as directed by PT/0/A/4150/048 and OP/1/A/6100/SU-2, both Gamma-Metrics shutdown monitor's alarm switches are placed in "NORMAL" when the respective neutron flux count rate increases to above 0.2 cps after a fuel assembly has been placed in front of the monitor.

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When the initial fuel assemblies were loaded in the core, the neutron flux count rate was lower than needed to restore the Gamma-Metrics shutdown monitor's alarm switch to "NORMAL," therefore, the switches remained in "BYPASS."

Also following placement of the initial fuel assemblies, it is necessary to adjust the high flux at shutdown alarm setpoint for each NIS source range channel. During this setpoint adjustment, the channel becomes Inoperable.

At 1226 on April 15, 2007, NIS source range channel N32 was logged Inoperable to adjust the high flux at shutdown alarm setpoint. With both Gamma-Metrics shutdown monitor's alarm switches in "BYPASS," this left only NIS source range channel N31 as fully Operable.

Core reload continued.

At 1252, NIS source range channel N32 high flux at shutdown alarm setpoint adjustment was complete and restored to Operable status.

At 1312, NIS source range channel N31 was logged Inoperable to adjust the high flux at shutdown alarm setpoint. With both Gamma-Metrics shutdown monitor's alarm switches in "BYPASS," this left only NIS source range channel N32 as fully Operable.

Core reload continued.

At 1315, core reload was suspended when a tornado watch was issued for the area around McGuire.

At 1358, NIS source range channel N31 high flux at shutdown alarm setpoint adjustment was complete and restored to Operable status.

Around this time, Engineering noticed that both Gamma-Metrics shutdown monitor's alarm switches were in "BYPASS." Engineering informed Operations that this had rendered the Gamma-Metrics shutdown monitors Inoperable.

Given that the Required Actions and Completion Times of Condition A of TS 3.9.3 were not satisfied during the NIS source range channel alarm setpoint adjustments, this event represented a condition prohibited by plant Technical Specifications reportable per the requirements of 10 CFR 50.73 (a) (2) (i) (B).

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CAUSAL FACTORS

The cause of this event was the failure to ensure that the operability requirements of the Gamma-Metrics shutdown monitors were adequately captured in the applicable surveillances and operating procedures when these monitors were credited in Technical Specifications as redundant source range neutron flux monitors in 1994.

CORRECTIVE ACTIONS

Immediate:

1. The requirement to log a Gamma-Metrics shutdown monitor as Inoperable if its alarm switch is in "BYPASS" in Mode 6 was added to the control room Operator's turnover log.

Subsequent:

1. Lessons learned communication was sent to all control room Operators.
2. Information stickers were placed on the Gamma-Metrics shutdown monitor alarm switches for both Units informing the Operators that placing this switch in "BYPASS" renders the associated monitor Inoperable per TS 3.9.3.

Planned:

1. Revise the Semi-Daily Surveillance Items Checklist, PT/1&2/A/4600/003 A, clarifying the TS 3.9.3 Operability requirements including the function of the Gamma-Metrics shutdown monitor alarm switch.
2. Revise the Total Core Reloading procedure, PT/0/A/4150/033, and the Internal Transfer Development procedure, PT/0/A/4150/048, to ensure the Gamma-Metrics shutdown monitor alarm switch is placed in "NORMAL" prior to Core Alterations when crediting Gamma-Metrics shutdown monitor Operability.
3. Revise the Refueling and Replacing Reactor Vessel Head procedure, OP/1&2/A/6100/SU-2, to ensure the Gamma-Metrics shutdown monitor alarm switch is placed in "NORMAL" prior to Core Alterations when crediting Gamma-Metrics shutdown monitor Operability.

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4. Revise the computer based Technical Specification Action Item Log (TSAIL) by adding a comment that if a Gamma-Metrics shutdown monitor is being credited for Operability, its alarm switch must be placed in "NORMAL."
5. Place a permanent label on the Gamma-Metrics shutdown monitor alarm switches for both Units informing the Operators that placing this switch in "BYPASS" renders the associated monitor Inoperable per TS 3.9.3.

SAFETY ANALYSIS

The source range neutron flux monitors provide a signal to alert the Operators to unexpected changes in core reactivity such as a boron dilution accident or an improperly loaded fuel assembly.

At the time of this event, one NIS source range channel was fully operable with visible count rate indication, an audible high flux at shutdown alarm in the control room, and audible indication of count rate in the control room and upper containment. In addition, both Gamma-Metrics shutdown monitors were providing visible count rate indication. Also, Reactor Engineering was regularly monitoring and recording the neutron count rate during the entire core reloading process.

During this event, the boron concentration in the Reactor Coolant System was verified to be within the Core Operating Limit Report (COLR) limits. Also during this event, all sources of unborated water that are connected to the Reactor Coolant System were secured closed to ensure the required boron concentration stated in the COLR would not be violated. Together these controls prevent a dilution event and are required by Technical Specifications.

In conclusion, the overall safety significance of this event was determined to be minimal and there was no impact on the health and safety of the public.

ADDITIONAL INFORMATION

A six year search of the McGuire corrective action database (PIP) and LER database revealed one (1) similar event. Therefore, this event is considered to be recurring. Since the position of the Gamma-Metrics shutdown monitor alarm switches were not relevant to the 2005 LER (see below), they were not addressed at that time.

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