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June 6, 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 370/2005-04, Revision 0

Pursuant to 10 CFR 50.73, Sections (a)(1) and (d), attached is Licensee Event Report (LER) 370/2005-04, Revision 0, concerning an automatic actuation of the Unit 2 Main Steam Isolation Valves.

On April 8, 2005, the Unit 2 Main Steam Isolation Valves closed in response to an unplanned and valid Main Steam Line Isolation Signal. This represented a system actuation reportable as per the requirements of 10CFR50.73(a)(2)(iv)(A).

This event was determined 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

IE22

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NRC FORM 366 (6-2004) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

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

APPROVED BY OMB NO. 3150-0104 EXPIRES 06-30-2007

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.

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4. TITLE

Actuation of Main Steam Isolation Valves Due to Human Error.

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	08	2005	2005	- 004 -	00	06	06	2005	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE	3
10. POWER LEVEL	000

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)	X	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)		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	TELEPHONE NUMBER (Include Area Code)
Julius W Bryant, Regulatory Compliance	704-875-4162

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
A	SB	ISV	A585	No					

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 start of the event, Unit 2 was in MODE 3 (Hot Standby).

Event Description: On 4/8/2005, during startup from a Unit 2 refueling outage, Operations was increasing primary system pressure and temperature. During this evolution, Operations misjudged the rate at which Pressurizer pressure and steam line pressure would rise relative to each other. As a result, Pressurizer pressure was not maintained below the value which blocks generation of a Main Steam Line Isolation Signal due to a steam line low pressure condition. Given that Main Steam pressure had not yet increased sufficiently to clear the steam line low pressure condition, a valid and unplanned Main Steam Isolation Signal was generated which closed the Main Steam Isolation Valves. This represented a system actuation reportable as per the requirements of 10 CFR 50.73 (a)(2)(iv)(A). This event was not significant with respect to the health and safety of the public.

Event Cause: The primary system temperature and pressure increase was a first time evolution for the Operator controlling primary system temperature and pressure. His lack of experience resulted in misjudgments and inappropriate actions on the part of the Operator. In addition, the Control Room Supervisor misjudged the level of oversight required.

Corrective Action: Applicable procedures will be revised as needed to ensure adequate Pressurizer pressure margin is maintained until all steam line low pressure bistables have reset.

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

BACKGROUND

Main Steam Isolation Valves [ISV](MSIV):

The Unit 2 Main Steam System [SB](SM) contains four MSIVs manufactured by Atwood and Morrill Co. In MODE 3, these valves are required to be operable except when they are closed and de-activated. Each valve is located downstream of its respective Steam Generator [SG](SG) and is designed to automatically close upon receipt of a Main Steam Line Isolation Signal (Engineered Safety Feature). This ensures the following safety functions are accomplished:

- MSIV closure isolates all four SGs to ensure that no more than one SG is affected in the event of a steam line break. This minimizes the positive reactivity effects of the break by ensuring that the Reactor Coolant System [AB](NC) does not experience excessive cooldown as a result of the increased steam flow.

- MSIV closure isolates all four SGs to ensure that no more than one SG is affected in the event of a steam line break inside containment. This minimizes the containment temperature and pressure increase.

Main Steam Line Isolation Signal On Steam Line Low Pressure:

Each SG has three channels of instrument loops which monitor the associated steam line pressure. A steam line low pressure signal is generated if bistables on 2 out of 3 channels on 1 or more SGs are tripped. These bistables trip at a nominal value of 775 psig decreasing. These bistables reset at a nominal value of 788 psig increasing, which indicates that the steam line low pressure condition has cleared.

A steam line break resulting in a steam line low pressure condition would generate a Main Steam Isolation Signal. In MODE 3, this isolation function is required to be operable whenever Pressurizer pressure is greater than 1955 psig, except when the MSIVs are closed and de-activated. This isolation function is blocked at Pressurizer pressures below 1955 psig and automatically instates at pressures above 1955 psig.

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EVENT DESCRIPTION

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

On April 8, 2005, Unit 2 startup was in progress following a refueling outage. Operators were in the process of increasing primary system temperature and pressure using OP/2/A/6100/SU-19. The Balance of Plant(BOP) Operator was tasked with performing that evolution under the oversight of the Control Room Supervisor.

- Unit 2 entered MODE 3 when NC system temperature had been increased to 350 degrees Fahrenheit. At these NC system conditions, Main Steam line pressure is below the steam line low pressure bistables trip setpoint of 775 psig.

- After entering MODE 3, the Control Room Supervisor conducted a pre-job brief with the BOP Operator. Although this briefing did not discuss the potential for generating a Main Steam Isolation Signal, the BOP Operator was aware of a caution in OP/2/A/6100/SU-19 which indicates that, prior to exceeding a Pressurizer pressure of 1955 psig, ensure that Main Steam line pressure had increased sufficiently to reset the steam line low pressure bistables. The BOP Operator was also aware that the procedure indicated a failure to perform this verification would result in the generation of a Main Steam Line Isolation Signal and subsequent automatic closure of the MSIVs. Given the above, the BOP Operator recognized that he would have to closely monitor system conditions while increasing NC system temperature and pressure.

- At the appropriate time in the evolution, the BOP Operator adjusted the Pressurizer Pressure Master Controller to a setting equating to 1800 psig. Subsequent to this, the BOP Operator observed that Pressurizer pressure had increased to 1800 psig. However, he did not recognize that Pressurizer pressure had actually increased to approximately 1830 psig and then returned to 1800 psig. This overshoot is not unusual given the Proportional-Integral design of the Pressurizer Pressure Master Controller loop.

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

- As the NC system heatup continued, the BOP Operator recognized that NC system temperature was approaching a value that would equate to a Main Steam line pressure which would reset the steam line low pressure bistables. Once these bistables are reset, Pressurizer pressure could be raised above 1955 psig without generating a Main Steam Line Isolation Signal. Therefore, the BOP Operator informed the Control Room Supervisor of his intention to raise NC system pressure. The Control Room Supervisor concurred and, given that Pressurizer pressure would be approaching 1955 psig, cautioned the BOP Operator to monitor system conditions. Note that the Control Room Supervisor assumed the BOP Operator would approach an NC system pressure of 1955 psig by incrementally adjusting the Pressurizer Pressure Master Controller.

- The BOP Operator then adjusted the Pressurizer Pressure Master Controller to a setting equating to 1950 psig. The BOP Operator concluded that the 1950 psig setting was adequate since he believed the steam line low pressure bistables would reset prior to Pressurizer pressure approaching 1950 psig. The basis for this conclusion included his earlier observation of Pressurizer pressure response when the Pressurizer Pressure Master Controller was adjusted to a setting equating to 1800 psig and his observation of SG steam line pressure indicators which indicated pressures greater than 775 psig. Note that the NC system temperature and pressure increase in this range of operation was a first time evolution for the BOP Operator. Due to his lack of experience, he did not recognize that NC system temperature and correspondingly Main Steam line pressure would rise slower than expected at the elevated NC system temperatures. In addition, he did not recognize that Pressurizer pressure would rise quicker than he expected.

- Subsequent to setting the Pressurizer Pressure Master Controller at 1950 psig, the BOP Operator observed that the controller was increasing Pressurizer pressure much quicker than he expected and did not appear to be stabilizing as pressure approached 1950 psig. The BOP Operator attempted to take manual control and reduce Pressurizer pressure. These actions were unsuccessful and Pressurizer pressure overshot the setpoint and exceeded 1955 psig. Since Main Steam line pressure had not yet risen sufficiently to reset the steam line low pressure bistables, a valid and unplanned Main Steam Line Isolation Signal was generated which caused all the Unit 2 MSIVs to close as designed. This represented a system actuation reportable as per the requirements of 10 CFR 50.73 (a)(2)(iv)(A).

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

CAUSAL FACTORS

The NC system temperature and pressure increase was a first time evolution for the BOP Operator. His lack of experience resulted in misjudgments and inappropriate actions on the part of the BOP Operator. Specifically, the BOP Operator underestimated the rate of Pressurizer pressure increase and overestimated the rate of steam line pressure increase. As a consequence of these misjudgements, he did not adequately monitor Pressurizer pressure.

In addition, two contributing causes were identified. First, although the BOP Operator was generally experienced, this was a first time evolution for him. The Control Room Supervisor assumed the BOP Operator was experienced for this evolution and misjudged the level of oversight required. Second, the BOP Operator misjudged the overshoot effect associated with the Proportional-Integral design of the Pressurizer Pressure Master Controller.

CORRECTIVE ACTIONS

Immediate:

- Following closure of the MSIVs, the plant was stabilized. Upon evaluation of plant conditions, the Main Steam Isolation Signal was reset and the NC system temperature and pressure increase continued without incident.

Subsequent:

- Operations personnel were coached on conservative decision making and maintaining operating margin.

- Operations training was conducted related to this event with emphasis on conservative decision making.

Planned:

- Procedure OP/2/A/6100/SU-19 and the corresponding Unit 1 procedure will be revised as needed to provide specific actions to ensure adequate Pressurizer pressure margin is maintained until all steam line low pressure bistables have reset. This should prevent misjudgements and/or Pressurizer Pressure Master Controller overshoot from causing similar events.

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- The pre-job briefing checklist form will be modified to address first time evolutions and ensure adequate oversight.

SAFETY ANALYSIS

At the time of the event, Unit 2 was in MODE 3 with essentially no Main Steam flow. Upon receipt of the Main Steam Isolation Signal, the Unit 2 MSIVs closed as designed and no abnormal equipment or system perturbations occurred. This event did not have an adverse affect on equipment needed to maintain the Unit in a safe condition. The ability to reopen the MSIVs was not affected nor was additional mitigation equipment, such as the secondary PORVs, unavailable. Therefore, the automatic closing of the MSIVs represented a negligible change in risk.

At no time were the health and safety of the public or plant personnel affected as result of this event.

ADDITIONAL INFORMATION

A review of the McGuire corrective action database did not identify any other events having similar circumstances, cause, and corrective actions. Therefore, 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.