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November 14, 2005

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 369/2005-04, Revision 0  
Problem Investigation Process (PIP) M-05-4227

Pursuant to 10 CFR 50.73, Sections (a)(1) and (d), attached is  
Licensee Event Report (LER) 369/2005-04, Revision 0.

This report is being submitted in accordance with 10 CFR  
50.73 (a)(2)(i)(B) due to the McGuire Unit 1 Ice Condenser  
lower inlet door failed surveillance testing.

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

U.S. Nuclear Regulatory Commission  
November 14, 2005  
Page 2 of 2

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<b>NRC FORM 366</b> (6-2004)		<b>U.S. NUCLEAR REGULATORY COMMISSION</b>		<b>APPROVED BY OMB NO. 3150-0104</b> <b>2007</b>		<b>EXPIRES 06-30-</b>		
<b>LICENSEE EVENT REPORT (LER)</b> (See reverse for required number of digits/characters for each block)								
<b>1. FACILITY NAME</b> McGuire Nuclear Station, Unit 1				<b>2. DOCKET NUMBER</b> 05000 369		<b>3. PAGE</b> 1 OF 5		
<b>4. TITLE</b> Ice Condenser Lower Inlet Door Failed Surveillance Testing								
<b>5. EVENT DATE</b>			<b>6. LER NUMBER</b>		<b>7. REPORT DATE</b>		<b>8. OTHER FACILITIES INVOLVED</b>	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MONTH	DAY	YEAR
09	17	2005	2005	- 004 -	00	11	14	2005
<b>9. OPERATING MODE</b> 5			<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)</b>					
<b>10. POWER LEVEL</b> 000			20.2201(b)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)(B)	
			20.2201(d)		20.2203(a)(4)		50.73(a)(2)(iii)	
			20.2203(a)(1)		50.36(c)(1)(i)(A)		50.73(a)(2)(iv)(A)	
			20.2203(a)(2)(i)		50.36(c)(1)(ii)(A)		50.73(a)(2)(v)(A)	
			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)		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)		OTHER Specify in Abstract below or in NRC Form 366A		
<b>12. LICENSEE CONTACT FOR THIS LER</b>								
<b>NAME</b> Kay L Crane, Regulatory Compliance						<b>TELEPHONE NUMBER (Include Area Code)</b> 704-875-4306		
<b>13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT</b>								
CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER
X	BC	DR	W121	Yes				
<b>14. SUPPLEMENTAL REPORT EXPECTED</b>						<b>15. EXPECTED SUBMISSION DATE</b>		
YES (If yes, complete 15.EXPECTED SUBMISSION DATE).				X NO		MONTH DAY YEAR		
<b>16. ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)</b> Unit Status: At the time of the event, Unit 1 was in Mode 5 (Cold Shutdown) at 0 percent power.  Event Description: On September 17, 2005, testing of the forty-eight Ice Condenser Lower Inlet Doors (LIDs) was performed in accordance with Technical Specification (TS) Surveillance Requirement (SR) 3.6.13.6. The "as-found" testing was performed in Mode 5 during the unit shutdown as a first time evolution. This SR ensures all LIDs' open uniformly by quantifying resistance in the door hinges and springs through a series of force tests. Two of the forty-eight LIDs failed to meet a portion of the SR test acceptance criteria (TAC). McGuire subsequently determined that these two LIDs could have been previously inoperable in Modes 1-4 for a period longer than allowed by TS.  Event Cause: The failure of the two doors has been attributed to excessive spring tensioning caused by corrosion of the rod end/clevis brackets. Inadequate preventive maintenance resulted in excessive force being required to open the two LIDs.  Corrective Action: All rod end/clevis brackets on the forty-eight LIDs have been cleaned, lubricated and satisfactorily retested in accordance with SR 3.6.13.6.								

**LICENSEE EVENT REPORT (LER)**

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
McGuire Nuclear Station, Unit 1	05000369	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 5
		2005	- 004	- 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.

The Ice Condenser [COND] (NF) is an Engineered Safety Feature System containing borated ice that acts to absorb energy in the event of a Loss of Coolant Accident (LOCA) or a Main Steam Line Break. As a result, steam is condensed and post accident pressure is reduced to ensure containment integrity.

The Ice Condenser is divided into 24 bays. Each bay has a pair of Lower Inlet Doors [DR] (LIDs). Each LID is designed with four proportioning springs. One end of each spring is attached to a pin and clevis mounted on the door panel. The other end is attached to a spring housing mounted on the door frame. The clevis pin allows the spring coil to freely swivel as the door is opened. The LIDs are designed to quickly open due to differential pressure during a large break LOCA or during a high energy line break such that energy is evenly absorbed by the ice bed. For a small break LOCA scenario, the LIDs are designed to open uniformly and modulate air and steam flow to prevent an uneven distribution of steam into the ice bed. All forty-eight LIDs are required to be operable in Modes 1-4.

During a small break LOCA event, the LIDs will begin to open with a 1 pound per square foot (PSF) differential pressure between lower containment and the ice bed. Sustained lower containment pressure at this magnitude (or higher) will move the doors to their full open position (i.e., 40 degrees from closed) against shock absorbers.

Technical Specification (TS) Surveillance Requirement (SR) 3.6.13.6 assesses the LIDs' ability to open and modulate air and steam flow in the event of a small break LOCA event. This is accomplished by quantifying resistance in the door hinges and springs through a series of opening/closing force tests. Associated test acceptance criteria (TAC) include:

1. Verify that the torque, T (Open), required to cause opening motion at the 40 degree open position is  $\leq 195$  in-lb (approx. 7-1/8 lb at door test position).
2. Verify that the torque, T (Close), required to hold the door stationary at the 40 degree open position is  $\geq 78$  in-lb (approx. 3 lb at door test position).
3. Calculate the frictional torque of each door using the results obtained from the above steps, and verify that the calculated frictional torque, T (Friction) is  $\leq 40$  in-lb.

## LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE	
McGuire Nuclear Station, Unit 1	05000369	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 OF 5	
		2005	- 004	- 00		

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

These torque values are tested every 18 months in accordance with procedure PT/0/A/4200/32, "Periodic Inspection of Ice Condenser Lower Inlet Doors." If any LID cannot meet the torque related acceptance criteria of PT/0/A/4200/32 during Modes 1-4, then that LID shall be declared inoperable and the appropriate Required Action of TS 3.6.13 shall be implemented within the required Completion Time.

**EVENT DESCRIPTION**

At the time of the event, McGuire Unit 1 was in Mode 5, cold shutdown, at 0 percent power. No structures, systems or components which could have contributed to either the event's occurrence or its significance were out of service at the time of the event.

On September 17, 2005, McGuire completed "as-found" surveillance testing on the LIDs in accordance with procedure PT/0/A/4200/032, Rev 13, "Periodic Inspection of Ice Condenser Lower Inlet Doors." This "as-found" testing was performed in Mode 5 during the unit shutdown as a first time evolution. Out of a total of forty-eight LIDs, two LIDs exceeded the torque T (Open) force of SR 3.6.13.6 TAC #1 as explained on page no. 2.

An investigation revealed that binding between the clevis and clevis pins restricted the door springs such that a small amount of additional force was required to maintain the 40 degree open position. The rod end/clevis brackets on all forty-eight doors were cleaned and lubricated. Post-maintenance re-tests were conducted in Mode 6 on October 13, 2005. All forty-eight doors successfully met their test acceptance criteria.

**CAUSAL FACTORS**

On May 2, 2005, McGuire submitted Licensee Event Report (LER) 370/2005-02 regarding the failure of Unit 2 LIDs during surveillance testing. As a result, procedure MP/0/A/7150/141 was revised to include inspection and preventive maintenance of the LID spring clevis brackets/rod ends, and inspection and cleaning of the hinge bearing housings, including swing arms.

Surveillance testing per PT/0/A/4200/032 had previously been performed in the as-left (i.e., just prior to unit start-up) condition. This procedure was revised to require performance in both the as-found (i.e., prior to maintenance of the LID hinges or springs) and as-left conditions.

The cause of the two doors failing to meet SR 3.6.13.6 TAC #1 has been attributed to excessive spring tensioning caused by corrosion of the rod end/clevis brackets. A sufficient amount of detail was not provided in

## LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
McGuire Nuclear Station, Unit 1	05000369	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 5
		2005	- 004	- 00	

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

the maintenance instructions in MP/0/A/7150/141 prior to the procedure revision. Therefore, inadequate preventive maintenance resulted in a small amount of additional force being required to maintain the 40 degree open position.

The Unit 1 End-of-Cycle (EOC) 17 refueling outage was the first available opportunity to implement the new preventive maintenance procedure enhancements documented on May 2, 2005 in LER 370/2005-02 (Planned Corrective Action #1).

**CORRECTIVE ACTIONS****Immediate Corrective Actions:**

1. Rod end/clevis brackets on all forty-eight LIDs were cleaned and lubricated. Two springs were replaced on one of the failed LIDs. A total of five springs were replaced on four LIDs.

**Subsequent:**

1. Post maintenance re-tests were successfully completed on all forty-eight doors.

**Planned Corrective Actions:**

None

**SAFETY ANALYSIS**

Based on the following, this event is not considered to be significant. At no time was the safety or health of the public or plant personnel affected as a result of the event.

The Ice Condenser design basis requires it to function properly to maintain peak containment pressure below the containment design pressure. To ensure the ice bed is available to absorb energy from a Main Steam Line Break or LOCA, the Ice Condenser Lower Inlet Doors must be capable of opening at a relatively low pressure to prevent steam from bypassing the Ice Condenser to upper Containment during a small break LOCA.

Large Break LOCA and Main Steam Line Break are the design basis limiting transients for the Ice Condenser. The blow-down load from a large break LOCA bounds small break LOCAs as well as steam line and feedwater line breaks. The pressure differential across the LIDs following a large break LOCA will be substantially greater than that applied to the doors in the TS SR 3.6.13.6 torque test procedure. The doors which failed the TSSR 3.6.13.6 torque test procedure requirements

## LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE	
McGuire Nuclear Station, Unit 1	05000369	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	5 OF 5	
		2005	- 004	- 00		

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

would have opened as designed following the potential bounding LOCA.

Analyses have been performed using the GOTHIC computer code to determine what fraction, if any, of the LIDs can be completely blocked closed with containment pressure remaining below the calculated peak containment internal pressure (Pa=14.8 psig) during the blow-down period of the limiting size Large Break LOCA. These analyses demonstrated that approximately 1/3 of the forty-eight doors can be completely blocked shut (i.e., will not open at all) during the design basis events and containment pressure will remain below 14.8 psig.

The LIDs at McGuire were not blocked shut. The doors would have opened as designed during a limiting Large Break LOCA. For the small break LOCA event, the doors also would have opened as designed, but two of the doors might not have exhibited the expected flow proportioning capabilities as described in UFSAR 6.2.2.8.1.

In conclusion, the GOTHIC results demonstrate that for a large break LOCA, all of the Ice Condenser Lower Inlet Doors would have performed their design basis function. Adequate operating doors would mitigate the small break LOCA. The slight increase in the required opening/closing torque on the two LIDs would not be expected to have a measured effect on the containment response following any design basis accident.

**ADDITIONAL INFORMATION**

A three year review of the McGuire corrective action database identified one previous reportable occurrence of the LIDs failing to meet the torque test. This was reported in LER 370/2005-02. The Unit 1EOC17 refueling outage was the first opportunity to implement the preventive maintenance procedure enhancements documented in Planned Corrective Action #1 of this LER.