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October 5, 2007

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

Subject: McGuire Nuclear Station, Units 1 and 2
Docket Nos. 50-369, 50-370
Licensee Event Report 369/2007-04, Revision 0
Problem Investigation Process (PIP) M-07-04313

Pursuant to 10 CFR 50.73, Sections (a) (1) and (d), attached is Licensee Event Report (LER) 369/2007-04, Revision 0, concerning the inability to manually backwash nuclear service water strainers during accident conditions.

This report is being submitted in accordance with 10 CFR 50.73 (a) (2) (i) (B), an operation prohibited by Technical Specifications, and 10 CFR 50.73 (a) (2) (v) (B), any event or condition that could have prevented fulfillment of the safety function.

There are no regulatory commitments contained in this letter.

G. R. Peterson

Attachment

IE22
NRR

cc: W. D. Travers
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NRC FORM 366 (6-2004) U.S. NUCLEAR REGULATORY COMMISSION

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

LICENSEE EVENT REPORT (LER)

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

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4. TITLE
Procedure Deficiency identified for Performing a Manual Backwash of Nuclear Service Water (RN) Strainers due to reliance on Non-Safety Instrument Air

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
									MNS Unit 2	05000 370
08	06	2007	2007	- 004 -	00	10	05	07	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)	X	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	TELEPHONE NUMBER (Include Area Code)
Richard Abbott	704-875-4685

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

On August 6, 2007, the "A" Train of the Nuclear Service Water (RN) System was declared inoperable due to deficient procedure guidance for manually backwashing RN strainers during Design Basis Accidents (DBA). The Station Instrument Air (VI) System is non-safety-related and cannot be relied upon to manually backwash the RN strainers during or following design basis accidents. At the time of discovery, both units 1 and 2 were in Mode 1 (power operation) and operating at approximately 100 percent power.

It was determined there were two periods during the past three years when macro-fouling impacted A Train RN operability. The duration of macro-fouling in 2004 exceeded the 72 hour completion time allowed by Technical Specifications (TS) and is reported as a condition prohibited by plant TS. In addition, scheduled surveillances performed during the 2004 macro-fouling period rendered "B" Train System, Structure, and Components (SSC) inoperable resulting in two trains being simultaneous inoperable and is reportable as an event or condition that could have prevented the fulfillment of a safety function.

The root cause of this event was historical modifications to the RN Strainers were completed without an adequate evaluation of the safety-related to non-safety-related system interactions. Immediate actions were taken to restore the ability to manually backwash RN during accident conditions without VI and a root cause evaluation was completed.

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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. The following lists the systems referred to and the applicable TS sections:

Nuclear Service Water (RN) [BI], TS 3.7.7
Diesel Generator (DG) [DG], TS 3.8.1
Control Room Area Ventilation (VC) [VI], TS 3.7.9
Control Room Area Chilled Water (YC)[KM], TS 3.7.10
Auxiliary Building Filtered Ventilation Exhaust System (VA) [VF], TS 3.7.11
Boron injection flow path, Selected Licensee Commitment (SLC)16.9.9.
Auxiliary Feedwater (CA)[BA], TS 3.7.5
Component Cooling Water (KC)[CC], TS 3.7.6
Residual Heat Removal (ND)[BP], TS 3.5.2
Safety Injection System (NI) [BQ], TS 3.5.2
Containment Spray System (NS)[BE], TS 3.6.6
Chemical and Volume Control System (NV)[CB], TS 3.5.2

The principal safety related function of the Nuclear Service Water System (RN) [BI] is the removal of decay heat from the reactor via the Closed Cooling Water System (KC) [CC] during a Design Basis Accident (DBA) or transient. This requires that the RN system maintain required cooling water flow rates to essential heat exchangers during a DBA.

A Nuclear Service Water train is considered OPERABLE during MODES 1, 2, 3, and 4 when:

a. The associated unit's pump is OPERABLE; and

b. The associated piping, valves, and instrumentation and controls required to perform the safety related function are OPERABLE.

Strainers [STR] are installed immediately upstream of the RN pumps. The related support function of the RN strainer is to ensure adequate suction pressure and flow rate are maintained during normal and accident conditions. Each strainer can be backflushed either automatically or manually.

Section 9.2.2.2a of the Updated Final Safety Analysis Report (UFSAR) states, "During a DBA upon receipt of a SI signal the automatic backwash function for the RN strainers is isolated and strainer backwash is performed manually to prevent unnecessary loss of water from the system."

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Units 1 and 2 RN Strainer Backflush Automatic Supply Isolation Valves and RN Strainer Backflush Automatic Drain Isolation Valves are safety related air-operated valves. The valves fail closed on loss of instrument air.

During normal operations, instrument air is provided by three centrifugal air compressors. Two diesel powered and three reciprocating compressors provide instrument air if the centrifugal compressors cannot maintain system pressure at acceptable levels.

The Diesel Powered Instrument Air Compressors are designed to automatically start upon decreasing air pressure, failure of the VI compressor sequencer panel, or loss of Recirculated Cooling Water System (KR) flow.

Since the VI System is non safety related it cannot be assumed to be available to aid in mitigating the consequences of a Design Basis Initiating Event or mitigating the consequences of a Design Basis Accident.

The RN System supports the operability of other TS Systems (cascading) which includes the Diesel Generator (DG)[DG], Control Room Area Ventilation (VC)[VI], Control Room Area Chilled Water (YC)[KM], Auxiliary Building Filtered Ventilation Exhaust System (VA) [VF], Boron injection flow path, Auxiliary Feedwater (CA)[BA], Component Cooling Water (KC)[CC], Residual Heat Removal (ND)[BP], Safety Injection System (NI) [BQ], Containment Spray System (NS)[BE], and the Chemical and Volume Control System (NV)[CB].

EVENT DESCRIPTION

The following historical information was selected from the timeline prepared during the root cause. The information is provided as a lead into the event being reported as a point of reference.

In August 1993, McGuire made the decision to downgrade the RN Strainer internal components and RN Strainer backwash system components to non-safety and that a 10CFR50.59 evaluation was not necessary. The portions of the RN strainers that makeup system pressure boundaries remained safety related. The System design bases specification was revised to state that failure of any instrument associated with the backwash operation would not make RN system inoperable. At this time, procedure guidance to manual backwash RN strainers was adequate in that it relied on manually operated system valves.

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In October 2000 and April 2001, McGuire completed a modification to replace Unit 2 and Unit 1 RN strainer manual outlet valves with new air operated diaphragm valves. The valve actuator air supplies were modified to enable manual valve operation by applying instrument air directly to the valve actuators. Following completion of the modifications procedure guidance to perform a manual backwash during design bases accidents was no longer adequate.

In 2003, the filtering and manual backwash functions for the Strainers were restored to safety-related based on observations of seasonal macro-fouling that began in 2001. The filtering and backwash functions were safety related in the past, the change was completed under a corrective modification without fieldwork.

In August 2007, the station experienced frequent automatic RN strainer backwashes due to high differential pressures. The reason was known to be seasonal macro-fouling that occurs in the July/August timeframe when alewife fish seek the cooler temperature water found at the depth of the RN low level intakes (LLI) from Lake Norman, part of McGuire Nuclear Station (MNS) ultimate heat sink (includes Standby Nuclear Service Water pond). The fish that enter the LLI are collected on the RN strainers and ultimately backwashed.

It was during this time that the site discovered the manual backwash credited in the UFSAR could not be performed as directed by procedure under a postulated loss of VI condition. Procedure guidance required manipulation of air operated RN Strainer Backflush Automatic Drain Isolation Valves. It was realized that the procedure relied on repositioning air operated valves to restore backwash following a DBA but VI can not be assumed to be available during the DBA.

The "A" Train of RN was declared inoperable due to the inability to manually backwash the Strainers procedurally. The station entered Technical Specification (TS) Section 3.7.7 and took actions necessary to comply with all applicable requirements. Reasonable assurance that B Train RN remained operable existed since B train automatically realigns to the SNSWP during a DBA. There are currently no known macro-fouling sources in the SNSWP that would be expected to cause significant blockage of the RN Strainer challenging the function during any 30 day period. Historical data from station computers, fish population surveys, and the results of annual clam inspections supports that no significant populations are present in the SNSWP. Although the B train RN was operable the system was realigned to the

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SNSWP as a precautionary measure until corrective / compensatory actions were completed.

An evaluation of the last three years of historical data indicated that there were two periods August 9 - 15, 2004 and August 3 - 5, 2007 when the frequency of automatic backwashes was judged to indicate that macro-fouling concentrations precluded reasonable assurance of operability; therefore, "A" Train RN would have been past inoperable. The station is allowed to operate for up to 72 hours with one RN Train inoperable. Since the 2004 period of macro-fouling exceeded 72 hours, due to the unrecognized deficiency with the manual backwash capability, the units were operated past the 72 hour completion time allowed by TS without taking required actions. This condition was determined to be reportable per 50.73(a) (2) (i) (B), "Any operation or condition which was prohibited by the plant's Technical Specifications."

In addition, it was verified that surveillances were performed during the 2004 macro-fouling period that rendered the "B" Train of RN or related support systems inoperable. The following are reported as conditions that could have prevented fulfillment of a safety function per 50.73(a)(2)(v)(B):

- Unit 2 B Train RN inoperable for 2 hours and 34 minutes on 8/9/2004 to flush Control Room Area Chilled Water.
- Unit 2 B Train Diesel Generator inoperable for 14 minutes on 8/10/2004.
- Unit 2 B Train of ND inoperable for 16 hours and 12 minutes on 8/10/2004.
- B Train VC/YC inoperable for 2 hours and 45 minutes on 8/11/2004.
- Unit 2 B Train NI inoperable for 8 hours and 59 minutes on 8/11/2004.
- Unit 1 B Train NS inoperable for 7 hours and 52 minutes on 8/12/2004.

Also, surveillance activities resulted in conditions that were prohibited by TS and are reportable per 50.73(a)(2)(i)(B):

- Unit 2 B Train Pressurizer Heaters inoperable for 12 hours and 11 minutes on 8/9/2004. This condition would have exceeded required actions specified in TS 3.0.3.

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- Unit 2 B Train NI inoperable for 8 hours and 59 minutes on 8/11/2004. This condition would have exceeded required actions specified in TS 3.5.2.

- Unit 1 B Train NS inoperable for 7 hours and 52 minutes on 8/12/2004. This condition would have exceeded required actions specified in TS 3.0.3.

Root Cause

The root cause of this event was historical modifications to the RN Strainers were completed without an adequate evaluation of the safety-related to non-safety-related system interactions.

CORRECTIVE ACTIONS

Immediate:

- "A" Train RN was declared inoperable. "B" Train RN was conservatively realigned to the Standby Nuclear Service Water Pond where no known source of macro-fouling exists.

Subsequent:

- Temporary design changes were implemented and associated procedure revisions completed to restore the ability to manually backwash RN strainers during accident conditions.

- Compensatory actions were completed to restore and maintain both A and B RN Trains to an Operable but Degraded / Nonconforming Condition while aligned to the low level intake (LLI).

- A Root Cause analysis was initiated.

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Planned:

- The Scope of Modifications and/or License Amendments necessary to eliminate the OBDN condition and associated compensatory actions will be defined by March 1, 2008.
- Implementation of Modifications and/or License Amendments for both Units 1 and 2 will be completed by the end of the Unit 2 Fall 2009 refueling outage.
- 10CFR50.59 qualified personnel and appropriate site engineering personnel will be trained on applicable deficiencies identified in the root cause evaluation of this event/condition by December 1, 2007.
- Air operated valves that receive a safety signal with a requirement to be manually repositioned to mitigate a DBA will be reviewed to determine if the licensing/design bases is met by December 1, 2007.

SAFETY ANALYSIS

Duke Energy used a risk-informed approach to determine the risk significance of the procedure deficiency and conditions that existed which could have led to clogging of the Nuclear Service Water System inlet strainers.

The preliminary risk assessment determined that the Conditional Core Damage Probability (CCDP) associated with this condition is > 1E-6 for both Units 1 and 2. The Conditional Large Early Release Probability (CLERP) associated with this condition is >1E-07 for both Units 1 and 2. This LER will be revised if the final approved safety analysis indicates a different result than reported in this section.

ADDITIONAL INFORMATION

A recurring event determination was performed researching the McGuire corrective action database for the previous five years and it was concluded this was not a recurring event.

There were no releases of radioactive materials, radiation exposures, or personnel injuries associated with this event.