



STEVEN D. CAPPS
Vice President
McGuire Nuclear Station

Duke Energy
MGO1VP / 12700 Hagers Ferry Rd.
Huntersville, NC 28078

980-875-4805
980-875-4809 fax
Steven.Capps@duke-energy.com

January 30, 2013

10 CFR 50.73

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

Subject: Duke Energy Carolinas, LLC
McGuire Nuclear Station, Unit 2
Docket No. 50-370
Licensee Event Report 370/2012-02, Revision 0
Problem Investigation Process Number M-12-10164

Pursuant to 10 CFR 50.73(a)(1) and (d), attached is Licensee Event Report (LER) 370/2012-02, Revision 0, regarding an automatic actuation of the Auxiliary Feedwater and Nuclear Service Water Systems.

This report is being submitted in accordance with 10 CFR 50.73(a)(2)(iv)(A), any event or condition that resulted in manual or automatic actuation of any of the systems listed in 10 CFR 50.73(a)(2)(iv)(B).

This event is considered to be of no significance with respect to the health and safety of the public. There are no regulatory commitments contained in this LER.

If questions arise regarding this LER, contact P. T. Vu at 980-875-4302.

Sincerely,

Steven D. Capps

Attachment

IE22
NRR

U.S. Nuclear Regulatory Commission
January 30, 2013
Page 2

cc: V. M. McCree
Administrator, Region II
U.S. Nuclear Regulatory Commission
Marquis One Tower
245 Peachtree Center Ave.
NE Suite 1200, 30303-1257

J. H. Thompson
Project Manager
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852-2738
Mail Stop O-8 G9A

J. Zeiler
NRC Senior Resident Inspector
McGuire Nuclear Station

W. L. Cox III, Section Chief
North Carolina Department of Environment and Natural Resources
Division of Environmental Health
Radiation Protection Section
1645 Mail Service Center
Raleigh, NC 27699-1645

Estimated burden per response to comply with this mandatory collection request 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA/Privacy Section (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NE0B-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.

LICENSEE EVENT REPORT (LER)

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

1. FACILITY NAME McGuire Nuclear Station, Unit 2	2. DOCKET NUMBER 05000- 0370	3. PAGE 1 OF 4
--	--	--------------------------

4. TITLE
Automatic Actuation of the Auxiliary Feedwater and Nuclear Service Water Systems

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
12	01	2012	2012	02	0	01	30	13	None	05000
									FACILITY NAME	DOCKET NUMBER
									None	05000

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)									
10. POWER LEVEL 039	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)						
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)						
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)						
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)						
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)						
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)						
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)						
<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER							
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	<input type="checkbox"/> Specify in Abstract below or in NRC Form 366A							

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME P. T. Vu, Regulatory Compliance	TELEPHONE NUMBER (Include Area Code) 980-875-4302
--	--

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			
YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO			MONTH	DAY	YEAR

16. ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

At approximately 23:17 on December 1, 2012, Unit 2 experienced an actuation of the Anticipated Transient Without Scram Mitigation System Actuation Circuitry (AMSAC), which initiated an automatic turbine trip and automatic start of the 2A and 2B motor driven Auxiliary Feedwater (CA) pumps. The 2A Nuclear Service Water (RN) pump was operating at the time. The 2B RN pump automatically started due to start of the 2B CA pump. The actuation occurred at approximately 290 psig turbine inlet pressure when AMSAC unexpectedly armed with low feedwater flow conditions. It was subsequently determined that the setpoint in the AMSAC setpoint calibration procedure had not been changed to reflect the new setpoint of approximately 359 psig associated with the replacement high pressure turbine.

The cause of this event was the lack of a formal method for notifying the McGuire Major Projects (MMP) procedure team when Engineering Changes (ECs) that are owned by MMP are approved.

Corrective actions include modifying the computer application Nuclear Asset Suite used for ECs to correct this deficiency.

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE	
McGuire Nuclear Station, Unit 2	05000	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2	OF 4
		2012	- 02	- 0		

17. NARRATIVE

BACKGROUND

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

The Auxiliary Feedwater System [BA] (CA) automatically supplies feedwater to the steam generators [SG] (SG) to remove decay heat from the Reactor Coolant System [AB] (NC) upon the loss of normal feedwater [SJ] (CF) supply. The CA System consists of two motor driven CA pumps [P] and one steam turbine driven pump configured into three trains. Each motor driven CA pump motor is cooled from its corresponding train of the Nuclear Service Water System [BI] (RN). Automatic start signals are provided to the respective RN pump upon start of the respective motor driven CA pump.

The RN System provides a transfer mechanism for the removal of process and operating heat from safety related components during a Design Basis Accident or transient. During normal operation, and a normal shutdown, the RN System also provides this function for various safety related and non-safety related components.

The Anticipated Transient Without Scram Mitigation System Actuation Circuitry (AMSAC) provides an alternate means of tripping the main turbine [TRB] and actuating CA flow apart from the Reactor Protection System [JC] (IPE). It arms at 40% nominal turbine load increasing, disarms below 40% nominal turbine load, and actuates on either "Loss of Both CF Pump Turbines" or "Loss of CF Due to Valve Closure". When AMSAC actuation occurs, it will trip the main turbine, start both motor driven CA pumps, and close the SG blowdown and sampling valves.

Selected Licensee Commitment 16.7.1 requires AMSAC to be operable in Mode 1 above 40% RTP (Rated Thermal Power). If AMSAC is inoperable, it must be returned to operable status within 7 days or a Special Report outlining the cause of the malfunction and plans for restoring the system to operable status must be submitted within 37 days.

EVENT DESCRIPTION

At approximately 23:17 on December 1, 2012, Unit 2 experienced an AMSAC actuation, which initiated an automatic turbine trip and automatic start of the 2A and 2B motor driven CA pumps. The 2A RN pump was operating at the time. The 2B RN pump automatically started due to start of the 2B CA pump. This event was reported to the Nuclear Regulatory Commission (NRC) Operations Center pursuant to 10 CFR 50.72(b)(3)(iv)(A) (Event Notification No. 48549). At the time of this event, McGuire Unit 1 was operating in Mode 1 at approximately 100% power and Unit 2 was operating in Mode 1 at approximately 39% power. No structures, systems or components were out of service at the time of this event that contributed to this event.

Sequence of events:

- November 2010 Engineering Change (EC) 105123 (Unit 2 High Pressure Turbine (HPT) Replacement – Instrumentation and Controls) Revision 0 was initiated.
- February 24, 2012 Duke Energy was informed by Siemens that the replacement high pressure turbine inlet pressure operating point would be 911 psia (896.3 psig).

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
McGuire Nuclear Station, Unit 2	05000	2012	- 02	- 0	3 OF 4

17. NARRATIVE

- June 13, 2012 Procedure IP/2/B/3250/013 F (Turbine Inlet Pressure Switch Calibration) Revision 1 was approved with some changes per EC 105123 but contained the old AMSAC setpoint of 290 psig.
- August 31, 2012 EC 105123 Revision 2 was approved. This revision included the new AMSAC setpoint of 359 psig.
- October 4, 2012 Calibration of AMSAC pressure switches in No-mode was performed. The old AMSAC setpoint was still in the calibration procedure.
- December 1, 2012 Unit 2 turbine automatically tripped and motor driven 2A and 2B CA pumps automatically started on AMSAC actuation. 2B RN pump automatically started due to start of the 2B CA pump.

For the old high pressure turbine, the high turbine impulse pressure was approximately 725 psig. For the replacement high pressure turbine, the high turbine inlet pressure is approximately 896 psig. The AMSAC setpoint for the old high pressure turbine was 40% of the high turbine impulse pressure or approximately 290 psig. For the replacement high pressure turbine, 40% of the high turbine inlet pressure is approximately 359 psig. The calibration procedure was not updated with the new setpoint of 359 psig. As such, the AMSAC circuitry armed earlier than expected, at a turbine inlet pressure of approximately 290 psig instead of 359 psig which tripped the turbine.

CAUSAL FACTORS

The cause for not updating calibration procedure IP/2/B/3250/013 F with new AMSAC setpoint is that there was no formal method for notifying the McGuire Major Projects Procedure Team (MMPPT) when an EC revision was approved.

All maintenance procedures are owned by the Maintenance Procedure Team (MNTPT) while the maintenance procedures for the ECs that are owned by MMP are written by MMPPT but owned by MNTPT. The EC review milestone for all maintenance procedures is automatically assigned through the computer application Nuclear Asset Suite (NAS) for ECs to a single point contact in MNTPT. There is no automatic notification through NAS to MMPPT when EC revisions that are owned by MMP are approved. If this notification had occurred, MMPPT would have identified the need for a procedure correction regarding the AMSAC setpoint.

CORRECTIVE ACTIONS

Immediate:

1. Procedure IP/2/B/3250/013 F was revised with the new setpoints and the pressure switches were re-calibrated allowing Unit 2 to be re-started.
2. A list of all trips, permissives, control interlocks, turbine trips, and AMSAC information relative to Unit 2 high pressure turbine and generator replacement has been reviewed. It was verified that correct values

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE	
McGuire Nuclear Station, Unit 2	05000	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4	OF 4
		2012	- 02 -	0		

17. NARRATIVE

have been established, procedures have been revised and values have been implemented in the field correctly.

Subsequent:

1. MMPPT was added in addition to MNTPT in NAS to receive all EC approval messages.

Planned:

1. MMP Engineering will review all MMP owned ECs that are approved and waiting to be implemented to ensure required setpoint changes are included in approved or pending procedure changes.
2. MMP Engineering will review all MMP owned ECs that are approved to determine if any situations occur where all design inputs are not available and to document these situations in the corrective action program.
3. Process to be implemented that all MMP owned ECs add additional routing in NAS to include MMPPT supervisor. Note that NAS already included proper notification to non-MMP owned ECs.

SAFETY ANALYSIS

The AMSAC actuation occurred unexpectedly due to AMSAC pressure switches not calibrated with the new main turbine inlet pressure value. The AMSAC circuitry armed earlier than expected, at a turbine inlet pressure of approximately 290 psig instead of approximately 359 psig. As stated in the Background section of this LER, AMSAC is an alternate means of tripping the turbine and actuating CA flow apart from the Reactor Protection System; it is not the primary means for protecting the NC System from overpressurization. Selected Licensee Commitment 16.7.1 allows AMSAC to be out of service for 7 days. Once actuated, it initiated the automatic turbine trip and automatic CA System start as designed. For this event, the unit was maintained stable at approximately 15% power after the turbine trip. There was no high pressure concern in the NC System prior to, during or after this event. All steam generators were maintained at adequate levels to ensure an adequate heat sink for the NC System. A turbine trip is an anticipated operational occurrence of moderate frequency. This event is considered to be not significant with respect to the health and safety of the public or plant personnel.

ADDITIONAL INFORMATION

A five year search of the McGuire corrective action database (PIP) revealed no other events where, as a result of a modification, a procedure was impacted but not updated. A five year search of the McGuire LER database revealed no other modification related procedure errors which caused safety system actuations. Therefore, this event is not recurring.

Note that at approximately 11:42 on December 2, 2012, Unit 2 experienced a second AMSAC actuation, automatic turbine trip, 2A and 2B CA pumps start, and 2B RN pump start during re-calibration of the AMSAC pressure switches. This event was deemed an invalid actuation and was reported to the NRC Operations Center by telephone in lieu of a written LER (Event Notification No. 48550).