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H. B. Barron
Vice President

March 6, 2000

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

Subject: McGuire Nuclear Station, Units 1 and 2
Docket No. 50-369, 50-370
Licensee Event Report Number 369/00-02, Revision 0
Problem Investigation Process No. M-99-5183

Pursuant to 10 CFR 50.73 Sections (a) (1) and (d), attached is Licensee Event Report 369/00-02, Revision 0 concerning a condition allowed by plant Technical Specifications which could have resulted in operation outside the design basis of the plant. This report is being submitted in accordance with 10 CFR 73 (a) (2) (ii) (B).

The specific condition is a deficiency in the current ACTION statement for the McGuire Technical Specifications which allows an inoperable Refueling Water Storage Tank (FWST) level channel to be placed in the trip condition for an indefinite period of time. With one channel in a trip condition, a single failure of another FWST level channel could result in premature swapover of the Residual Heat Removal (ND) pumps to the Containment Sump following a Loss of Coolant Accident (LOCA). This premature swapover could result in a loss of post-accident cooling functions.

Given the short period of time following a LOCA when the Containment Sump level is insufficient to support operation of the ND pumps and the low frequency of an FWST level channel spurious signal, plant PRA analyses indicate that the increase in Core Damage Frequency from this event is insignificant. Consequently, this event is considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

H. B. Barron, Jr.

Attachment

JEJ

U. S. Nuclear Regulatory Commission
March 6, 2000
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LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) McGuire Nuclear Station, Unit 1	DOCKET NUMBER (2) 05000 369	PAGE (3) 1 of 6
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TITLE (4) McGuire Units 1 and 2 in a condition outside design basis of plant due to Refueling Water Storage Tank level channels in a trip condition for an indefinite period of time.

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER(S)
02	04	00	00	- 02	- 0	03	06	00	McGuire Unit 2	05000 370

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (Check one or more of the following) (11)										
POWER LEVEL (10) 100%	20.402(b)			20.405(c)			50.73(a)(2)(iv)			73.71(b)	
	20.405(a)(1)(i)			50.36(c)(1)			50.73(a)(2)(v)			73.71(c)	
	20.405(a)(1)(ii)			50.36(c)(2)			50.73(a)(2)(vii)			OTHER (Specify in	
	20.405(a)(1)(iii)			50.73(a)(2)(i)			50.73(a)(2)(viii)(A)			Abstract below and	
	20.405(a)(1)(iv)			X 50.73(a)(2)(ii)			50.73(a)(2)(viii)(B)			in Text, NRC Form	
20.405(a)(1)(v)			50.73(a)(2)(iii)			50.73(a)(2)(x)			366A)		

LICENSEE CONTACT FOR THIS LER (12)								TELEPHONE NUMBER			
NAME Julius W. Bryant								AREA CODE (704)		875-4162	

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)											
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS *		

SUPPLEMENTAL REPORT EXPECTED (14) YES (f yes, complete EXPECTED SUBMISSION DATE)	X	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e. approximately fifteen single-space typewritten lines) (16)
Unit Status: On February 4, 2000, Unit 1 was in Mode 1 at 100% power and Unit 2 was in Mode 1 at 65% Power.
Event Description: McGuire Technical Specifications (TS) allow for the option of placing an inoperable channel of Refueling Water Storage Tank (FWST) level instrumentation in the trip condition. McGuire has identified past instances where this option was invoked. Since the TSs allowed operation in this trip condition for an indefinite period of time, this condition cannot be considered as the design basis single failure during a design basis accident. Consequently, with one channel of FWST level instrumentation in the trip condition, a single failure of another channel coincident with a design basis Loss of Coolant Accident (LOCA) could have resulted in premature swapover of the Residual Heat Removal (ND) pumps to the Containment Sump. If premature swapover were to occur, both trains of ND pumps could fail due to insufficient Containment Sump water level. This could result in a loss of post-accident cooling functions.
Event Cause: Deficiency in McGuire Technical Specification 3.3.2 - Engineered Safety Feature Actuation System (ESFAS) Instrumentation.
Corrective Action: Duke Energy will submit a TS amendment to provide limitation on the time an FWST level channel can be in a trip condition.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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BACKGROUND:

McGuire Units 1 and 2 each have a Refueling Water Storage Tank (FWST) which provides a suction source for the respective Unit's Residual Heat Removal (ND) pumps, Safety Injection (NI) pumps, and Charging (NV) pumps (low head, medium head, and high head safety injection pumps, respectively). These pumps start upon receipt of a safety injection (SI) signal to inject Emergency Core Cooling System (ECCS) water into the reactor following a Loss of Coolant Accident (LOCA). In addition, the FWST provides a suction source for each Unit's Containment Spray (NS) pumps which, on receipt of a high-high containment pressure signal following a high energy line break in containment, start and spray cool water into the containment atmosphere to maintain pressure less than the design pressure of containment.

Three safety related level transmitters per Unit monitor FWST level and provide low FWST level signals at 180 inches decreasing to the ESFAS system. With two of these channels in a low level bistable trip condition coincident with an SI signal, the ESFAS automatically swaps the suction source for the ND pumps from the FWST to the Containment Sump to initiate the recirculation cooling phase of a LOCA event. A low FWST level signal would also prompt manual operator actions to secure NI and NV injection flow from the FWST and align these pumps to receive flow from the ND pumps to assist in post-LOCA recirculation phase cooling as needed. Note that, if the NS pumps were still running, operators would also manually switch the suction source for these pumps from the FWST to the Containment Sump upon receipt of a low-low FWST level signal. Control Room operators are trained to perform the above manual actions as needed using approved Emergency Procedures.

TS surveillance testing is performed on each Unit's FWST level channels (FWLT5000, FWLT5010, & FWLT5020) as follows:

- Channel Check every 12 hours: detects gross channel failure between channel calibration.
- Channel Operational Test every 31 days: the injection of a simulated or actual signal into the channel as close to the sensor as practicable to verify the operability of required alarm, interlock, and trip functions.
- Channel Calibration every 18 months: a complete check of the instrument loop, including the sensor, which verifies that the channel responds to measured parameter within the necessary range and accuracy.

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- Engineered Safety Feature (ESF) response time test every 18 months on a staggered test basis: ensures the individual channel ESF response times are less than or equal to the maximum values assumed in the accident analysis.

EVALUATION:

Description of Event

Prior to implementation of the Improved Technical Specifications (ITS) at McGuire in November 1998, old McGuire TS 3.3.2 - ESFAS Instrumentation provided an option to allow continued operation of the affected Unit until performance of the next channel operational test if an inoperable FWST level channel was placed in the trip condition. The applicable operational test had a monthly surveillance interval. McGuire ITS 3.3.2 provides an option to place an inoperable FWST level channel in the trip condition within 1 hour or be in Mode 3 within 7 hours and Mode 4 within 13 hours. However, unlike the old TS 3.3.2, ITS 3.3.2 allows operation in this trip condition for an indefinite period of time. With no time restrictions, a channel placed in the trip condition cannot be considered the design basis single failure assumed during a design basis accident. Therefore, with one channel of FWST level instrumentation in the trip condition, a single failure of another channel coincident with a design basis LOCA would have resulted in premature automatic swapover of the low head ND pumps to the Containment Sump. For a failure which leads to early swapover, plant analyses assume operators do not have sufficient time to resolve the problem prior to pump damage. Consequently, as a result of this premature swapover, both trains of the ND Pumps could have failed due to insufficient Containment Sump water level. This could have prevented these pumps from performing their post-LOCA cooling function. In addition, since they are dependent on the ND pumps for a water supply during the post-LOCA recirculation phase, the NI and NV pumps may not have been available to assist in this recirculation cooling function.

McGuire has identified past instances since the implementation of ITS where the option to place an inoperable FWST level channel in the trip condition was invoked (e.g. channel operational tests and channel calibrations). Given that ITS 3.3.2 allows the affected channel to be in this trip condition indefinitely, the possibility existed that post-LOCA cooling functions could have been lost. This represented operation outside the design basis of the plant.

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Cause of Event

The cause of this event is a deficiency in ITS 3.3.2.

Prior to implementation of ITS at McGuire in November 1998, old McGuire TS 3.3.2 - ESFAS Instrumentation provided an option to allow continued operation of the affected Unit until performance of the next channel operational test if an inoperable FWST level channel was placed in the trip condition. The applicable operational test had a monthly surveillance interval. However, upon conversion to ITS, a limit on the amount of time an FWST level channel could be in the trip condition was not incorporated into ITS 3.3.2. A review of the documentation associated with the ITS conversion process at McGuire indicates that the failure to incorporate a time limitation into the ESFAS Instrumentation TS was an inadvertent omission.

CORRECTIVE ACTION:

Immediate

Administrative controls were implemented to provide restrictions on the amount of time that an FWST level channel can be placed in the trip condition.

Planned

Duke Energy will submit an amendment to ITS 3.3.2 to provide a limitation on the time that an inoperable FWST level channel can be in a trip condition.

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SAFETY ANALYSIS:

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

McGuire ITS 3.3.2 provides an option to place an inoperable FWST level channel in the trip condition within 1 hour or be in Mode 3 within 7 hours and Mode 4 within 13 hours. ITS 3.3.2 does not place a restriction on the amount of time that an FWST channel can be in a trip condition. Consequently, a channel placed in the trip condition cannot be considered the design basis single failure assumed during a design basis accident. Therefore, with one channel of FWST level instrumentation in the trip condition, a single failure of another channel coincident with a design basis LOCA would have resulted in premature automatic swapover of the low head ND pumps to the Containment Sump. For a failure which leads to early swapover, plant analyses assume operators do not have sufficient time to resolve the problem prior to pump damage. Consequently, as a result of this premature swapover, both trains of the ND Pumps could have failed due to insufficient Containment Sump water level. This could have prevented these pumps from performing their post-LOCA cooling function. In addition, since they are dependent on the ND pumps for a water supply during the post-LOCA recirculation phase, the NI and NV pumps may not have been available to assist in this recirculation cooling function.

The reported condition is a concern during the early phases of a LOCA injection when the Containment Sump level is insufficient to support operation of the low head ND pumps. However, given the short duration that an FWST level channel is typically in a tripped condition (< 24 hours) and the short period of time following a LOCA when the Containment Sump level is insufficient to support operation of the ND pumps, PRA analysis has determined that the reported condition would only increase the Core Damage Frequency (CDF) by approximately $7.94E-09$ /reactor year. Note that this increase in CDF assumes the affected channel was in the trip condition for an entire year. Given that the instances since implementation of ITS where an FWST channel was in the reported condition were typically less than 24 hours, the actual increase in CDF was less than this PRA calculated value.

Note that the reported condition would not have had an impact on the ability of the NI and NV system to inject FWST water into the reactor following a LOCA. In addition, the ability of the NS system to provide containment cooling would not have been affected. As stated previously, upon receipt of an SI signal the NI and NV pumps take a suction directly from the FWST. The NS pumps would start and take suction from the FWST

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assuming an event resulted in a high-high containment pressure. A low FWST level signal does not result in any automatic actions relative to the suction source for these pumps. Instead, manual operator actions are required to isolate the FWST from these pumps upon receipt of such a signal. These manual actions are provided by plant EP's which direct the operators to monitor containment sump level, FWST level, and post-LOCA recirculation cooling flow prior to securing NI, NV, or NS flow from the FWST. Such monitoring would have precluded premature realignment of the suction source for these pumps.

Given the above, this event is considered to be of no significance with respect to the health and safety of the public.