

### LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) McGuire Nuclear Station - Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 6 9	PAGE (3) 1 OF 0 5
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TITLE (4)  
Both Trains of Containment Spray System Inoperable Due to Personnel Error

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 NAMES		DOCKET NUMBER(S)									
1	2	3 0 8	6	8	7	0	0	2	0	0	0	2	1	6	8	7			0 5 0 0 0	0 5 0 0 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

OPERATING MODE (9) 1	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10) 1 0 0	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 Abstract below and in Text, NRC Form 366A)
20.405(a)(1)(iii)	XX 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)		
20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)		
20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(ix)		

LICENSEE CONTACT FOR THIS LER (12)

NAME Phillip Bruce Nardoci - Licensing Engineer	TELEPHONE NUMBER AREA CODE 7 0 4 3 7 3 - 7 4 3 2
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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)

<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> 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)

On December 30, 1986, at 0839, Train 1B of the Solid State Protection System (SSPS) was declared inoperable for performance of a periodic test. At 0931, Containment Spray (NS) system Train 1A was declared inoperable for performance of a periodic test on the NS Train 1A Heat Exchanger. Operations (OPS) personnel erroneously thought that operability of NS system Train 1B was not affected by SSPS Train 1B being in the test mode. Consequently, both trains of the NS system were inoperable from 0931 to 1010 (The SSPS Train 1B periodic test was completed and SSPS Train 1B declared operable at 1010). With both trains of the NS system inoperable, Technical Specification 3.0.3 was in effect which requires one train to be operable or plant shutdown to be commenced within one hour. Unit 1 was in Mode 1, Power Operation, at 100% power at the time of the incident.

This incident is attributed to a Senior Reactor Operator (SRO) misunderstanding the impact on the NS system of the SSPS being in the test mode, and to inadequate controls to assure proper notification is made to appropriate Operations personnel of tests being performed which affect train operability. Appropriate training will be reiterated during licensed operator requalification training, and test procedures were changed to require an OPS signoff to ensure opposing train is operable.

Both trains of NS could have been made operable within the required time limits in the event of a LOCA. The health and safety of the public were unaffected.

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TEXT (if more space is required, use additional NRC Form 366A's) (17)

INTRODUCTION

On December 30, 1986, at 0839, Operations (OPS) personnel declared Train 1B of the Solid State Protection System (SSPS) [EIIS:JE] inoperable for Instrumentation and Electrical (IAE) personnel to perform a periodic test. At 0931, OPS personnel declared Containment Spray (NS) [EIIS:BE] system Train 1A inoperable so Performance (PRF) personnel could perform a periodic test on the NS Train 1A Heat Exchanger [EIIS:HX]. OPS personnel erroneously thought that operability of NS system Train 1B was not affected by SSPS Train 1B being in the test mode. Consequently, both trains of the NS system were inoperable from 0931 to 1010 (the SSPS Train 1B periodic test was completed and SSPS Train 1B declared operable at 1010). With both trains of the NS system inoperable, Technical Specification 3.0.3 was in effect which requires one train to be operable or plant shutdown to be commenced within one hour. Unit 1 was in Mode 1, Power Operation, at 100% power at the time of the incident.

This incident is attributed to a Senior Reactor Operator (SRO) misunderstanding the impact on the NS system of the SSPS being in the test mode, and to inadequate controls to assure proper notification is made to appropriate OPS personnel of tests being performed which affect train operability.

EVALUATION:

Background

In the event of a Loss Of Coolant Accident (LOCA), the NS system is designed to spray cool borated water into the upper containment building atmosphere. After the ice in the Ice Condenser [EIIS:COND] has melted, the NS system is designed to keep the containment building pressure below 15 psig by removing thermal energy from the containment atmosphere. During Modes 1, 2, 3, and 4, the NS system is aligned to take suction from the Refueling Water Storage Tank (RWST) [EIIS:TK] and is capable of transferring the RWST water to the NS spray nozzles [EIIS:NZL] in the containment building. The water will enter the containment building sump to be recycled by the NS pumps [EIIS:P] and cooled by the NS heat exchangers. Periodic testing is required to assure the structural integrity of the NS heat exchanger tubes [EIIS:TBG] and to determine the overall heat transfer coefficient and fouling factor of the NS heat exchangers.

The SSPS system receives input signals from the Reactor Protection system [EIIS:JC] and generates seven basic Engineered Safety Features (ESF) actuation signals. One of these signals actuates NS pumps and valves [EIIS:V]. Periodic testing of each train is accomplished through a self testing section built in each SSPS train. By the use of several different test switches located in the SSPS "Logic Cabinet", it is possible to determine that every logic decision of the SSPS is made properly. With these logic tests, it can be determined that the SSPS will properly respond to generated signals to initiate a reactor trip or a safeguards actuation. During this test, all output signals from the train in the test mode are blocked and no automatic or manual ESF actuation of the NS system can occur.

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Description of Incident

On December 30, at 0830, IAE personnel logged the SSPS Train 1B periodic test in the Periodic Test Logbook. At 0839, the SRO logged SSPS Train 1B inoperable and IAE personnel started to perform the periodic test on SSPS Train 1B. At 0900, PRF personnel logged that NS Heat Exchanger Train 1A periodic test in the Periodic Test Logbook and notified OPS personnel in the Control Room of the periodic test to be performed. PRF personnel did not remember who was contacted.

At 0931 indications were received in the Control Room indicating the start of the NS Train A Heat Exchanger periodic test. The Unit 1 Reactor Operator (RO) notified the SRO that power had just been removed from NS Train 1A Containment Isolation Valves and the NS Train 1A was inoperable, at which time the SRO logged NS Train 1A inoperable. The Unit 1 RO "assumed" that PRF personnel had discussed this periodic test with the SRO. The SRO did not remember any discussion with PRF personnel about the PRF periodic test.

IAE personnel reached the step in the SSPS Train 1B test that affected NS Train 1B automatic actuation. This was recognized by the Unit 1 RO when annunciators and status lights were actuated. The Unit 1 RO and the SRO discussed this portion of the SSPS Train 1B periodic test and the SRO was left with the impression that operability of NS Train 1B was not affected. The Unit 1 RO gave this impression due to a previous conversation with IAE personnel about how SSPS outputs cause various component actuations in the field. According to OPS personnel, this was a general conversation about how the SSPS works and at no time did IAE personnel imply that NS Train 1B operability would not be affected by the SSPS periodic test being performed. According to IAE personnel, NS Train 1B was inoperable during the entire performance of the SSPS periodic test.

After the conversation between the Unit 1 RO and the SRO, an NRC Resident Inspector noticed SSPS Train 1B and NS Train 1A were logged inoperable. The NRC Resident Inspector questioned the SRO and was told that IAE personnel had given assurances that NS Train 1B operability would not be affected by the SSPS periodic test. The SSPS Train 1B periodic test was completed at 1010, and the SRO declared SSPS Train 1B operable. Due to the misunderstanding between the Unit 1 RO and the SRO, both trains of NS were inoperable for 39 minutes (0931 to 1010). The NS Train 1B Heat Exchanger periodic test was completed at 1447, and the SRO declared NS Train 1A operable.

During review of the Unit 1 Technical Specifications Action Item Log by OPS personnel on January 15, 1987, it was discovered that both trains of the NS system were inoperable for 39 minutes on December 30, 1986.

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Conclusion

This incident was caused by Personnel Error, as the SRO failed to effectively communicate with the Unit 1 RO and did not understand the impact of SSPS Train 1B being inoperable. Contributing to this incident were inadequate controls to ensure that appropriate OPS personnel are contacted prior to starting a PRF periodic test.

The root cause of this incident was the failure of the SRO to recognize the impact on the NS system when the SSPS was in the test mode and failure to interrogate the Unit 1 RO further or contact IAE staff engineers on the impact of the SSPS being tested. The SRO had the opportunity to prevent this incident through better communications and by a more thorough understanding of the systems involved.

Also contributing to this incident was the PRF procedure not providing adequate provisions to ensure that appropriate OPS personnel were contacted to determine train operability. The PRF procedure has a step to ensure that the opposite train is operable but only requires a PRF signoff. A signoff by OPS personnel would have prevented starting the NS test without contacting appropriate OPS personnel.

A review of past McGuire Reports indicated there have been two other incidents involving both trains of NS being inoperable simultaneously (LERs 369/83-84 and 370/86-10). However, these were due to component failures and exceeding a temperature limit, and are not considered similar.

CORRECTIVE ACTIONS:

Shift supervisors were counseled to give increased attention to technical specification inoperabilities and to contact IAE Staff Engineers for guidance in situations if needed.

It will be reiterated to ROs and SROs during Licensed Operator Requalification Training the responsibilities of the RO and SRO. This training will emphasize the Control Room SRO has final responsibility for assuring system operability prior to approving surveillance or other work activities to begin.

The NS Heat Exchanger periodic tests for both units were changed to require an OPS signoff to ensure the train opposite to the one to be tested is operable.

SAFETY ANALYSIS:

During this incident, Unit 1 was at 100% power and both trains of the NS system were incapable of automatic or manual ESF actuation. In the event of a LOCA at 100% power it would have taken from 41 to 50 minutes for the Ice Condenser ice bed to melt. At the onset of a safety injection, the Safety Injection procedure (EP/1/A/5000/01) would be invoked. This procedure includes a step which instructs the operator to verify actuation of the NS system by status lights, and if actuation has not taken place, instructions tell the operator to manually initiate

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the NS system. If containment spray has not actuated after this step, instructions are provided to manually start the NS pumps and open the spray valves. If this scenario had occurred during this incident, the third step would have started NS Train 1B; however, NS Train 1A valves were deenergized for the PRF Periodic Test. It is believed an operator could have closed the NS Train 1A valve breakers within five minutes and both trains of NS would have been able to operate as designed. It is also believed SSPS Train 1B could have been taken out of the test mode in approximately 5 minutes and would have been operable. Therefore, both trains of NS could have been operable within the 41 minutes required for the ice melt.

The Residual Heat Removal (ND) [EIIS:BP] system can be lined up to provide partial containment spray and both trains of ND were operable during this incident. In the event of a LOCA, the ND system can be manually initiated at greater than 50 minutes into the accident or if containment pressure exceeds 10 PSI with both trains of ND available.

There were no personnel injuries, radiation overexposures, or releases of radioactive material as a result of this incident. The health and safety of the public were not affected by this incident.

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February 16, 1987

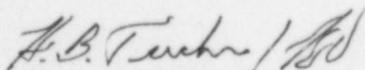
U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, D.C. 20555

Subject: McGuire Nuclear Station, Unit 1  
Docket No. 50-369  
LER 369/87-02

Gentlemen:

Pursuant to 10CFR 50.73 Sections (a)(1) and (d), attached is Licensee Event Report 369/87-02 concerning both trains of the containment spray system being inoperable due to a personnel error which is submitted in accordance with §50.73(a)(2)(i)(B). Note that this event will also be the subject of a special NRC/OIE Inspection Report (50-369,370/87-04). This event was considered to be of no significant with respect to the health and safety of the public.

Very truly yours,



Hal B. Tucker

PBN/50/jgm

Attachment

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