

# LICENSEE EVENT REPORT (LER)

FACILITY NAME(1)

McGuire Nuclear Station, Unit 1

DOCKET NUMBER(2)

05000 369

PAGE(3)

1 OF 5

TITLE(4) Technical Specification Required Surveillances Were Not Performed Due To  
Test Circuit Wiring Error Because Of Vendor Fabrication Deficiency

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)
03	02	93	93	01	0	04	02	93	McGuire, Unit 2	05000 370
										05000

OPERATING MODE(9)	1	THIS REPORT IS SUBMITTED PURSUANT TO REQUIREMENTS OF 10CFR (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 Abstract below and in Text)		
		20.405(a)(1)(iii)	X	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	TELEPHONE NUMBER
Terry L. Pedersen, Manager, Safety Review Group	AREA CODE 704
	875-4487

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT(13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NFRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NFRDS

SUPPLEMENTAL REPORT EXPECTED(14)

EXPECTED

MONTH

DAY

YEAR

SUBMISSION

DATE(15)

YES (If yes, complete EXPECTED SUBMISSION DATE)

X

NO

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

On March 2, 1993, McGuire Component Engineering personnel received informal notification from the NRC Resident Inspector identifying a problem discovered at Byron and Braidwood Nuclear Stations. An error in the wiring of the Westinghouse supplied Solid State Protection System (SSPS) was discovered during maintenance at Byron Nuclear Station. The wiring termination drawings which agreed with the as found condition were also in error. The wiring error resulted in the inability to properly test portions of the Engineered Safety Features (ESF) actuation and logic instrumentation channels to verify Phase B Containment Isolation logic path. Upon examination, the Component Engineering personnel discovered the same problem existed at McGuire Nuclear Station. Consequently, both Units entered Technical Specification (TS) 4.0.3 to complete surveillances on the effected equipment. A minor modification and associated work orders were issued to correct the wiring error and complete equipment testing. The modifications and testing were completed on March 2, 1993 and both Units exited TS 4.0.3. Units 1 and 2 were in Mode 1 (Power Operation) at 100 percent power at the time the event was discovered. This event is assigned a cause of Vendor Fabrication Deficiency since the equipment and associated drawing were supplied in an incorrect condition.

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**EVALUATION:**

**Background**

The Engineered Safety Features Actuation System (ESFAS) [EIIS:JE] is used to monitor selected plant parameters, determine whether predetermined safety limits are exceeded and, if they are, send signals into logic matrices that look for combinations that would indicate primary or secondary system boundary ruptures. Once the required logic is satisfied, the system sends actuation signals to the Engineered Safety Features (ESF) components whose function best serves the accident.

The ESFAS consists of two discrete portions of circuitry. The first is an analog portion which is made up of instrumentation monitoring various plant parameters such as Reactor Coolant (NC) [EIIS:AB] system pressure or Containment pressure. Each parameter may be monitored by either three or four redundant channels [EIIS:CHA]. The second is the digital portion consisting of two redundant logic trains. Each train receives input from the analog protection channels and performs the needed logic functions to actuate the necessary ESF components. Each train is equally and independently capable of actuating the ESF components that may be required.

The Containment Isolation System (CIS) is designed to isolate fluid systems that pass through Containment penetrations so as to confine to the Containment any radioactivity that may be released following a design basis event. The CIS is required to function following a design basis event to isolate non-essential fluid systems penetrating the Containment. The Phase B portion of a Containment isolation, which is concurrent with the Containment Spray (NS) [EIIS:BE] system actuation, isolates all but Safety Injection (NI) [EIIS:BQ] and NS lines penetrating the Containment. The CIS System is actuated either manually from the Control Room [EIIS:NA] or automatically on a two out of four coincidence high-high Containment Pressure signal from the ESFAS.

Technical Specifications (TS) 4.3.2.1 states that each ESFAS instrumentation channel and interlock, and the automatic actuation logic and relays, shall be demonstrated operable by the performance of the ESFAS surveillance requirements specified in Table 4.3-2. Table 4.3-2 specifies that Phase B Containment isolation automatic actuation logic be tested monthly with each train tested at least every 62 days on a staggered test basis.

**Description of Event**

On March 2, 1993, McGuire Component Engineering personnel received informal notification from the NRC Resident Inspector of a wiring error in the Solid State Protection System (SSPS) cabinets [EIIS:CAB] at Byron and Braidwood Nuclear Stations. The wiring error was

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discovered while performing corrective maintenance on the SSPS Logic Tester Circuit selector switch at Byron Nuclear Station. The same problem was verified to exist at Braidwood Nuclear Station. The wiring error caused the inability to test the Phase B Containment isolation logic path. The Containment spray logic path was tested twice. Wire number 845 was terminated at switch TB501, pin 5 instead of pin 6. When the selector switch was placed in the Phase B Containment isolation logic path test position, it was actually connected to the Containment spray logic test path again. The signal input is common to both the Containment spray and Phase B Containment isolation logic paths. Consequently, this wiring error is not detectable while performing the required TS periodic test of the Phase B Containment isolation logic circuitry.

The Component Engineering personnel reviewed the vendor supplied wiring drawings. The selector switch termination drawing for Train A exhibited the same condition identified at Byron and Braidwood Nuclear Stations. The Train B drawing was correct. The Component Engineering personnel then checked the as built wiring configuration of the SSPS cabinets. Both Train A and B cabinets were found to be miswired as indicated on the Train A termination drawing that was in error.

The Component Engineering personnel notified appropriate Operations (OPS) personnel of the discrepancy. Both Units entered TS 4.0.3 on March 2, 1993, upon discovery which gives 24 hours to complete missed surveillances. Minor Modification MGMM-5260 and work orders 93017199, 93017218, 93017219, and 9301720 were issued to correct the wiring and test the logic paths. The rewiring and test were completed on March 2, 1993. Upon completion both Units exited TS 4.0.3.

#### Conclusion

This event is assigned a cause of Vendor Fabrication Deficiency since the equipment and associated Train A drawing were supplied in an incorrect condition. Periodic testing and routine maintenance would not have detected the incorrect wiring.

A review of the Operating Experience Program (OEP) Data Base for the 24 months prior to this event revealed no events involving missed TS surveillances due to Vendor Fabrication Deficiency or missed surveillances involving the Phase B Containment isolation logic path. Therefore, this event is not considered to be recurring.

This event is not Nuclear Plant Reliability Data System (NPRDS) reportable.

There were no personnel injuries, radiation overexposures, or uncontrolled releases of radioactive material as a result of the event.

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## CORRECTIVE ACTIONS:

- Immediate: 1) Component Engineering personnel investigated to determine if identified conditions were applicable to McGuire.
- 2) Instrumentation and Electrical (IAE) personnel rewired and tested the logic test circuit in accordance with the issued minor modification and work orders.

Subsequent: None

Planned: None

## SAFETY ANALYSIS:

The CIS system, as described in Chapter 6 of the McGuire Nuclear Station Final Safety Analysis Report (FSAR), is designed to function following a design basis event to isolate non-essential fluid systems penetrating the Containment. The Phase B Containment isolation actuates at a high-high Containment Pressure signal of 3 pounds per square inch or greater in the Containment building such as during a large break LOCA or main steam line break. This accident, as described in Chapter 15 of the FSAR, is a transient which releases a large amount of energy into the Containment building. The isolation of non-essential fluid system penetrations aids in maintaining the integrity of the Containment building against the release of radioactivity to the environment; thereby, contributing to control of offsite releases at values less than those specified in 10 CFR 100.

The event described in this LER is technical in nature in that it deals with the failure to actually verify Phase B Containment isolation logic path TS surveillance requirement because of the wiring error in the Logic Tester Circuit. TS periodic testing was performed using approved procedures and the built in Logic Tester Circuit at a monthly frequency. In addition to this TS test, a time response test is performed on an 18 month refueling cycle. This test verifies the time it takes for an input signal at the bistables to be processed through the entire loop including the logic path and close the function actuating relay [EIIS:RLY] contacts. Since the testing performed following correction of the Logic Tester Circuit wiring found no inoperable logic path, and since the equipment history revealed no failures of this logic board [EIIS:ECBD], this circuit is not considered to have been past inoperable. Although the logic path was not actually verified on a monthly basis as required by TS, there is not a question of whether the circuitry would have actuated as required during an accident. From the time the SSPS

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cabinet was installed, until Logic Tester Circuit wiring was corrected, there were no conditions or combinations of conditions that would have required the Phase B Containment isolation to actuate. Therefore, the health and safety of the public were not affected as a result of this event.