

## 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 3																																																						
TITLE (4) Essential 41604 Switchgear IETA inadvertently deenergized during engineered safety features test.																																																																										
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)																																		
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OPERATING MODE (9) 5										THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)																																																																
POWER LEVEL (10) 0 1 0 1 0										20.402(b)										20.406(e)										<input checked="" type="checkbox"/> 50.73(a)(2)(iv)										73.71(b)																																		
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										20.406(a)(1)(ii)										50.36(e)(2)																				OTHER (Specify in Abstract below and in Text, NRC Form 365A)																																		
										20.406(a)(1)(iii)										50.73(a)(2)(i)										50.73(a)(2)(viii)(A)																																												
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LICENSEE CONTACT FOR THIS LER (12)																																																																										
NAME Phillip B. Nardoci, Licensing Engineer																				TELEPHONE NUMBER 7 0 4 3 7 3 - 7 4 3 2																																																						
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																																																																										
CAUSE															SYSTEM															COMPONENT															MANUFACTURER															REPORTABLE TO NRC														
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																																		

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

Personnel attempting to test the Unit 1 Engineered Safety Features (ESF) actuation of Unit 2 Nuclear Service Water Non-Essential Header Isolation Valve 2RN-43A inadvertently tripped the normal incoming circuit breaker to Essential 4160V Switchgear IETA, deenergizing the bus at 1406 on April 20, 1984. Diesel Generator Load Sequencer 1A responded as designed; shedding loads from IETA, starting Diesel Generator (D/G) 1A, closing the Diesel Generator Circuit Breaker, and starting blackout loads that were available. Unit 1 was in Mode 5 at the time of the event.

This event is attributed to Personnel Error because a jumper wire was attached to the wrong place in the circuit being tested, and was independently verified as being correctly installed. Also contributing to the event was Administrative/Procedural Deficiency, due to an erroneous procedure and misleading electrical elementary drawings.

Operators returned offsite power to IETA by closing the normal incoming circuit breaker. The D/G was then shutdown and unnecessary equipment stopped. Valve 2RN-43A was successfully tested. Appropriate personnel will be counseled.

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## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104  
EXPIRES: 8/31/85

FACILITY NAME (1)  McGuire Nuclear Station, Unit 1	DOCKET NUMBER (2)  0500036984	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
						OF	

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

Personnel attempting to test the Unit 1 Engineered Safety Features (ESF) [EIIS:JE] actuation of Unit 2 Nuclear Service Water Non-Essential Header Isolation Valve 2RN-43A [EIIS:V] inadvertently tripped the normal incoming circuit breaker [EIIS:BRK] to Essential 4160V Switchgear 1ETA [EIIS:EF], deenergizing the bus at 1406 on April 20, 1984. Diesel Generator Load Sequencer 1A responded as designed; shedding loads from 1ETA, starting Diesel Generator (D/G) [EIIS:GEN] 1A, closing the Diesel Generator Circuit Breaker [EIIS:BRK], and starting blackout loads that were available. Unit 1 was in Mode 5 at the time of the event.

This event is attributed to Personnel Error because a jumper wire was attached to the wrong place in the circuit being tested, and was independently verified as being correctly installed. Also contributing to the event was Administrative/Procedural Deficiency due to an erroneous procedure and misleading electrical elementary drawings.

Testing schedules and maintenance schedules often conflict. Components or parts of systems normally included in integrated tests are also scheduled for maintenance when the test is done. Operational considerations also conflict with tests. Components may be needed for operation of a system at the time of the integrated test. In such cases, it may be decided to test the individual component at a later date. A procedure change was written to cover items that were not tested during the ESF test, including valve 2RN-43A.

In order to isolate and test valve 2RN-43A, logic for seven other valves had to be modified by placing jumpers or by opening sliding links [EIIS:BRK]. Although the sliding links are shown on electrical elementary drawings (MCEEs), the representation is often schematically incorrect. The MCEE representation of the control circuit for valves ORN-12AC and 2RN-43A imply that relay CA [EIIS:RLY] contacts for ORN-12AC can be isolated without affecting the CA contacts for 2RN-43A by opening sliding link B13. In fact, opening B13 disables the logic for both valves. Properly identifying the wiring connections associated with these two valves, just on the part of the control circuits connected to CA, would require consulting 4 MCEEs, 1 connection diagram and 2 wire tabulation drawings. (This work is necessary to modify the circuit on only one of the seven valves that had to be disabled for this test of 2RN-43A.)

Misrepresentation of sliding links on MCEEs was first discovered at McGuire in 1975. It was subsequently decided it was not feasible to revise the MCEEs and that McGuire personnel would have to be trained to double check MCEE representation of sliding link applications against connection diagrams and wire tabulation drawings. The individual who wrote the Engineered Safety Features Actuation Periodic Test procedure change, to test 2RN-43A, was aware of the sliding link representation problem, and used the connection diagram to verify his method of isolating ORN-12AC. Since he thought he had confirmed the accuracy of the modification via the connection diagram, he did not consult the wire tabulation drawings. Due to the error, actuation of relay CA, manually and electrically during previous attempts to test 2RN-43A on April 14, 18, and 19 had no effect on the valve. Troubleshooting on April 17, 18, and 20 (prior to the test) were ineffective because the circuit modifications were removed after each test. Review of the procedure after the blackout discovered the problem and the procedure was revised. 2RN-43A was successfully tested on April 2 by opening sliding link B14 to isolate the logic to ORN-12AC.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/85

FACILITY NAME (1)  McGuire Nuclear Station, Unit 1	DOCKET NUMBER (2)  0 5 0 0 0 3 6 9 8 4 - 0 1 4 - 0 0 0 3 OF 0 3	LER NUMBER (6)			PAGE (3)		
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			

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

When 2RN-43A failed to respond to the manual actuation of CA on April 13, it was thought that the actuation method might not be moving all of the relay switches properly. It was decided to actuate the relay electrically by jumpering from a terminal in the D/G Load Sequencer 1A cabinet, which was known to be energized, to the coil of the relay (terminal C1). In order to prevent actuation of other relays connected to CA, the existing wire attached to CA was removed, and the jumper attached to the terminal. CA was successfully actuated on April 18, and 19, although the test of 2RN-43A failed. On April 20, the jumper was accidentally installed on the lifted lead rather than on terminal C1 of relay CA. The second individual checked the placement of the jumper and thought it was properly connected. When the switch was closed, various relays actuated, one of which tripped the normal incoming power circuit breaker, deenergizing 1ETA, and the blackout occurred. Diesel Generator Load Sequencer 1A responded as designed. Operators returned offsite power to 1ETA by closing the normal incoming circuit breaker at 1414, and then shutdown the D/G and stopped unnecessary equipment.

The error in the verification of the jumper wire attachment was apparently caused by the following factors: The "verifier" had just verified that the lead had been lifted from the correct terminal; the "doer" had installed the jumper correctly twice before, giving the verifier confidence that it was correctly installed just prior to the event; the alligator clip attached to the lead was less than one half inch from the terminal C1; and C1 and the alligator clip were obscured by the wires attached to other terminals on the relay.

This report will be covered with appropriate station personnel, stressing the following items:

Individuals should exercise particular care when modifying or verifying the modifications of systems. They should not be lulled into a false sense of security because the step has been done before.

Modifications of systems for testing must be researched to the extent that all possible consequences are known and understood. Technical reviews of procedures must be thorough and should be performed with the same source documents used for the preparation. Sufficient manhours must be scheduled to accomplish these tasks.

Personnel responsible for scheduling testing activities should consider the manpower and added risks involved in separating components or parts of systems from the integrated test. The main effort should be directed toward having complete systems available at the scheduled test times. Problems in test scheduling should be identified early enough (long before outages) so that procedure revisions can be prepared and reviewed when adequate manpower is available.

Diesel Generator Load Sequencer 1A and all associated equipment responded to the blackout as designed. All of this equipment was available for emergency duty throughout this event. The health and Safety of the public were not affected.



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HAL B. TUCKER  
VICE PRESIDENT  
NUCLEAR PRODUCTION

May 21, 1984

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

Subject: McGuire Nuclear Station, Unit 1  
Docket No. 50-369  
LER 369/84-14

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a)(1) and (d), attached is Licensee Event Report 369/84-14 concerning an automatic actuation of Diesel Generator 1A and Load Sequencer 1A when essential 41604 switchgear 1ETA was inadvertently de-energized during engineered safety features testing which is submitted in accordance with §50.73(a)(2)(iv). Initial notification of this event was made (pursuant to §50.72 Section (b)(2)(ii)) with the NRC Operations Center via the ENS on April 20, 1984. This event was considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

*H. B. Tucker / BTU*

Hal B. Tucker

PBN:glb

Attachment

cc: Mr. James P. O'Reilly, Regional Administrator  
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Mr. W. T. Orders  
NRC Resident Inspector  
McGuire Nuclear Station

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