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DUKE POWER

June 17, 1992

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

Subject: McGuire Nuclear Station Unit 2
Docket No. 50-370
Licensee Event Report 370/92-01, Revision 1

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a) (1) and (d), attached is Licensee Event Report 370/92-01, Revision 1, concerning an Inadvertent Engineered Safety Features Actuation. This report is being submitted in accordance with 10 CFR 50.73 (a) (2) (iv). This event is considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

T.C. McMeekin

TLP/bcb

Attachment

xc: Mr. S.D. Ebner
Administrator, Region II
U.S. Nuclear Regulatory Commission
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Atlanta, GA 30323

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1100 Circle 75 Parkway
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Mr. Tim Reed
U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D.C. 20555

Mr. P.K. Van Doorn
NRC Resident Inspector
McGuire Nuclear Station

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LICENSEE EVENT REPORT (LER)

FACILITY NAME(1)

McGuire Nuclear Station, Unit 2

DOCKET NUMBER(2)

05000 370

PAGE(3)

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TITLE(4) Unit 2 Train A Experienced an Inadvertent Engineered Safety Features Actuation Resulting From A Deficient Procedure and an Inappropriate Action.

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)
02	05	92	92	01	1	03	06	92	McGuire, Unit 2	05000 370
										05000

OPERATING MODE(9)	NM	THIS REPORT IS SUBMITTED PURSUANT TO REQUIREMENTS OF 10CFR (Check one or more of the following)(11)								
		20.402(b)		20.405(c)	X	50.73(a)(2)(iv)		73.71(b)		
POWER LEVEL(10)	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)				
		20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		OTHER (Specify in Abstract below and in Text)		
		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)(x)				

LICENSEE CONTACT FOR THIS LER(12)

 NAME
T.L.Pedersen, Manager, McGuire Safety Review Group

TELEPHONE NUMBER

AREA CODE

704

875-4487

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC

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 February 5, 1992, at 1019, Instrument and Electrical personnel were adjusting Unit 2 Train A Diesel Sequencer Committed Timer ST 7A setpoints to investigate and correct an increase in the timer speed. At the time of the event, Unit 2 was in No Mode (defueled) and Unit 1 was in Mode 5 (Cold Shutdown) at 0 percent power. Diesel Generator 2A was approximately 11 hours into a 24 hour test run at full load. When IAE personnel placed a jumper between terminals E1 and E10 in the Diesel Generator 2A Sequencer Cabinet as procedurally directed, the expected safety injection signal was generated. Because the Diesel Generator was paralleled to the grid and there was no blocking circuitry in effect, the safety injection signal caused Diesel Generator 2A breaker on Bus 2ETA to open and Diesel Generator 2A Sequencer to shed load. This constituted an Engineered Safety Features Actuation. The actuation was unexpected. The event is assigned causes of a Deficient Procedure and Inappropriate Action. The governing procedure will be revised to include all test prerequisites.

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EVALUATION:

Background

The 4160 Volt Essential Auxiliary Power (EPC) [EIIS:EB] system distributes essential power, either directly at 4160 volts or transformed to lower voltages, to nuclear safety related auxiliary equipment required to maintain safe Reactor [EIIS:RCT] status during the following plant conditions:

1. Normal Plant Operation (including Startup and Shutdown)
2. Hot and Cold Shutdown
3. Safety Injection actuation coupled with a Blackout Condition
4. Blackout Conditions

The Diesel Generator Auxiliary Power (EPQ) [EIIS:EJ] system and Diesel Generator Load Sequencers [EIIS:EK] function to energize the necessary Engineered Safety Features (ESF) loads in a prescribed sequence and in such a manner that the Diesel Generator (DG) [EIIS:DG] or the Auxiliary Transformer [EIIS:TD] are not momentarily overloaded. This is accomplished by a number of timers [EIIS:TW] which coordinate the load applications on the DG or Auxiliary Transformer as required. When load sequencing begins, safety related electrical equipment is powered from the DG as the Sequencer closes the breaker [EIIS:52] to each load group in the case of a Blackout. If a Blackout signal is not present, the ESF load group is powered from the normal Essential Electrical Bus [EIIS:BU] power supply as the Sequencer closes the breaker. When normal power is lost to an EPC system bus, all loads and feeder breakers will be automatically disconnected and reconnected to their respective essential bus by the Sequencer.

Description of Event

Verification of all setpoints of the timer relays in DG 2A load sequencer was made on January 23, 1992 in accordance with Work Request (WR) 600569. Sequence Timer (ST) [EIIS:TMR] 7A had reflected a time of 21.714 seconds on this date. This time was within the stated Technical Specification (TS) requirements.

During the performance of PT/2/A/4350/04A, Diesel Generator 2A Load Sequencer Test, on February 4, 1992, Performance (PRF) personnel had verified Train A Diesel ST 7A timed at 21.594 seconds. This did not satisfy the time specified in TS Table 4.8-2 (21.7-24.5 seconds).

On February 5, 1992, DG 2A was running at full load, and paralleled to the 2ETA Bus at full load. DG 2A was approximately 11 hours into a 24 hour break in run. Concurrently, Instrument and Electrical (IAE) personnel were performing a sequencer timer relay

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[EIIS:RLY] test on ST 7A to correct the increase in timer speed and return ST 7A to within the required TS time limits.

The recalibration was performed under the guidance of procedure IP/O/A/3350/12A, Train A Diesel Sequencer Timer Calibration. The procedure contains guidance used in either simulated blackout and Loss of Cooling Accident (LOCA) mode testing. IAE personnel reviewed the procedure prior to beginning work. Step 10.8, ST Relay Test contains the following note: "D/G control power must be tagged out to perform the following test." This was inconsistent with statements made at steps 5.4 and 10.1.4. These statements permit either the DG to be running or the DG control power to be tagged out. IAE personnel identified this inconsistency and notified supervision. After reviewing the MCEE 214.00 series (Unit 2 Load Sequencer) Electrical Elementary Diagrams and discussing the accuracy of this note, a decision was made by IAE personnel that the sequencer timer recalibration could be performed without tagging out the DG control power and would have no adverse effect on the DG run. This information was conveyed to OPS personnel and the DG System Engineer, both of whom concurred with the decision.

The work proceeded uneventfully under WR 600569 through step 10.1.6 of procedure IP/O/A/3250/12A. Sign. offs and independent verifications were made as appropriate. IAE personnel performed steps 10.8.1 and 10.8.2 of the procedure. When the IAE personnel placed a jumper between terminals E1 and E10 in DG 2A Sequencer cabinet, as directed by step 10.8.3 of the procedure, SSPS relay K608 was bypassed and a safety injection signal was generated. The generation of the safety injection signal was expected. However, as a result of the signal, DG 2A breaker on BUS 2ETA opened and DG 2A Sequencer shed load. The opening of the breaker was not expected and constituted an ESF actuation.

OPS personnel reset the sequencer and shutdown DG 2A. OPS personnel requested IAE personnel to visually inspect overcurrent relays 50 and 51 to determine if an actual overcurrent condition had caused DG 2A breaker on Bus 2ETA to open. IAE personnel inspected the relays and determined that no actual overcurrent condition occurred. OPS and IAE personnel then determined that the safety injection signal generated by the test had caused DG 2A Breaker on Bus 2ETA to open on an overcurrent signal. This overcurrent signal was generated by the DG 2A sequencer closing a contact to bypass the 50 and 51 relay circuitry. The signal generated by the sequencer was not an actual overcurrent condition but is used to open DG 2A breaker on 2ETA when normal power is available. OPS personnel then restarted and reloaded DG 2A. The required four hour NRC notification was made by OPS personnel in accordance with procedure RP/O/A/5700/10, NRC Immediate Notification Requirements at 1218 on February 5, 1992.

Conclusion

A cause of Defective Procedure is assigned to this event because the controlling

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procedure, IP/O/A/3250/12A contained inconsistencies relating to pretest equipment configuration.

Procedural step 5.4 specifies that the "D/G must be started or D/G Control Power must be deenergized prior to beginning the test". This precaution established the initial mindset that either condition would satisfy the procedural requirements. This precondition is mentioned again at step 10.1.4 which states "Have Control Room SRO start Train A D/G or tag out Train A D/G Start Control Power". These statements led IAE personnel to believe the intent of the note at step 10.8 which states "D/G control power must be tagged out to perform the following test" also included the provision that the DG could be running. Furthermore, the guidance to tag out the control power is presented in the form of a procedural note. This information should be presented as a procedural caution and more appropriately as a procedural step.

A cause of Inappropriate Action is also assigned to this event. Although IAE personnel reviewed the MCEE 214.00 series diagrams, they did not pursue a course of relay development which would have led to MCEE 215-00.02-05. This diagram indicates that DG 2A feedbreaker will open upon receipt of a safety injection signal when the DG is paralleled to the bus. Because the Solid State Protection System (SSPS) Train A was out of service with the fuses pulled, IAE personnel had an added margin of confidence that the recalibration would not jeopardize the DG run.

A review of the Operating Experience Program Data Base for the twenty four months prior to this event revealed one McGuire Licensee Event Report (LER) involving an ESF actuation with a cause of Deficient Procedure. This event is documented on LER 369/91-15. The review also identified four events in the interval involving ESF actuations with a cause of Inappropriate Action. These events were documented on LERs 369/90-09, 369/91-01, 370/91-11, and 369/91-15. Based on these results of the search, this event is considered recurring. The corrective actions developed for these LERs were unique to the specific events and would not have precluded this event.

This incident is not reportable to the Nuclear Plant Reliability Data System (NPRDS).

There were no personnel injuries, radioactive overexposures, or uncontrolled radioactive releases resulting from this event.

CORRECTIVE ACTIONS:

Immediate: IAE personnel visually inspected the 50 (instantaneous) and 51 (timed)

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overcurrent protective relay targets to verify that no valid instantaneous overcurrent signal existed.

Subsequent: (1) OPS personnel reset DG Sequencer 2A, stopped DG 2A, and restarted the DG.

(2) IAE crews involved in the incident have discussed the circumstance leading to the event in a crew meeting.

(3) OPS personnel made the required notification to the NRC in accordance with RP/O/A/5700/10, NRC Immediate Notification Requirements.

Planned: (1) A procedure major change to IP/O/A/3250/12A and IP/O/A/3250/12B will be processed to address the performance of the ST relay testing with the DG running and loaded.

(2) This LER will be incorporated into IAE lesson plan for IE-MC-ADM-259 (McGuire Electrical Elementries) and IE-MC-SYS-255 (DG Load Sequencer).

(3) Selected IAE personnel will be evaluated on MCEE drawing interpretation. Individuals who do not demonstrate satisfactory proficiency will be targeted for remedial training.

SAFETY ANALYSIS:

Unit 2 was in No Mode (defueled) at the time of the inadvertent ESF actuation. The ESF actuation system [EIIS:JE] is not required to be operable during No Mode because the ESF equipment does not serve to mitigate the consequences of an accident with the unit in Mode 5 (Cold Shutdown) or below. Some ESF equipment (Auxiliary Feedwater [EIIS:BA], Turbine [EIIS:TRB] Driven Pumps [EIIS:P], Safety Injection [EIIS:BQ] Pump, Centrifugal Charging [EIIS:CB] Pump, etc.) is intentionally removed from service in Mode 5 to preclude damage to the equipment or the unit because the ESF equipment is not designed to operate in Mode 5 or below. There were no operational problems, disturbances, or damage to Unit 2 as a result of this event.

Although not required in No Mode, DG 2B and its associated bus were operable and available for service if needed.

OPS personnel took immediate action to reset DG Sequencer 2A, stop DG 2A, and restart and reload the generator.

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The unexpected ESF actuation resulting from a planned safety injection signal and was not generated as a result of actual abnormal system conditions, but rather from a Deficient Procedure and an Inappropriate Action during normal maintenance of equipment.

This event did not affect the health and safety of the public.