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**DUKE POWER**

DATE: November 22, 1994

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

Subject: McGuire Nuclear Station Unit 1  
Docket No. 50-369  
Licensee Event Report 369/94-07, Revision 0  
Problem Investigation Process No.: 1-M94-1448

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a) (1) and (d), attached is Licensee Event Report 369/94-07 concerning an inadvertent manual start of Diesel Generator 1B. 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

RJD/bcb

Attachment

cc: Mr. S.D. Ebner  
Administrator, Region II  
U.S. Nuclear Regulatory Commission  
101 Marietta St., NW, Suite 2900  
Atlanta, GA 30323

INPO Records Center  
Suite 1500  
1100 Circle 75 Parkway  
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Mr. Victor Nerses  
U.S. Nuclear Regulatory Commission  
Office of Nuclear Reactor Regulation  
Washington, D.C. 20555

Mr. George Maxwell  
NRC Resident Inspector  
McGuire Nuclear Station

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G.H. Savage (EC06E)  
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M.S. Tuckman (EC07H)  
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Tim Becker (PB02L)  
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Kay Crane (MG01RC)  
Rich Casler (EC05N)

## LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), 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

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TITLE (4) Unit 1 Diesel Generator 1B Experienced An Inadvertent Manual Start Due To An Unknown, Possible Equipment Malfunction.

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)	
10	24	94	94	07	0	11	23	94	N/A	05000	
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (Check one or more of the following) (11)									
3		20.402(b)		20.405(c)		X		50.73(a)(2)(iv)		73.71(b)	
POWER LEVEL (10)		0 %		20.405(a)(1)(i)				50.73(a)(2)(v)		73.71(c)	
		20.405(a)(1)(ii)		50.36(c)(1)				50.73(a)(2)(vii)		OTHER (Specify in	
		20.405(a)(1)(iii)		50.36(c)(2)				50.73(a)(2)(viii)(A)		Abstract below and	
		20.405(a)(1)(iv)		50.73(a)(2)(i)				50.73(a)(2)(viii)(B)		in Text, NRC Form	
		20.405(a)(1)(v)		50.73(a)(2)(ii)				50.73(a)(2)(ix)		366A)	
				50.73(a)(2)(iii)							

LICENSEE CONTACT FOR THIS LER (12)

NAME

Rickey J. Deese, Manager, McGuire Safety Review Group

TELEPHONE NUMBER

AREA CODE

(704)

875-4065

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS

SUPPLEMENTAL REPORT EXPECTED (14)

EXPECTED SUBMISSION DATE (15)

MONTH DAY YEAR

YES (If yes, complete EXPECTED SUBMISSION DATE)

X

NO

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

On October 24, 1994, Operations (OPS) personnel were performing procedure PT/1/A/4350/02B, Diesel Generator (DG) 1B Operability Test. The purpose of the test was to ensure operability of the DG. During performance of the test control power had been removed from the DG Control Panel in order to verify that no fluid existed in the cylinders as a prerequisite for starting the DG. When control power was restored after this portion of the test, the DG started. No operator action had been taken which would have caused a start at that point. No signals had been received from the Engineered Safety Features Actuation (ESFA) system to have caused an automatic start of the DG. Subsequently, it was determined that a Manual Start Signal had been received by the DG Control Panel 200 milliseconds prior to the start. Investigation revealed no valid reason for the start or receipt of the Manual Start Signal. After verification that no ESFA system signal had been received, OPS Control Room personnel placed the Control Selector Switch in the Control Room Manual Position and shut down the DG. Further investigation and troubleshooting was performed and no problems were found with any circuitry for the DG. Subsequently the DG was tested and declared to be operable. Unit 1 was in Mode 3 (Hot Standby) at full temperature and pressure at the time of the event. A cause of Unknown, Possible Equipment malfunction is assigned. Corrective actions include further investigation of DG circuitry to validate that no problems exist.

**LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION**

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**EVALUATION:****Description of Event**

On October 24, 1994, Unit 1 was in Mode 3 (Hot Standby) at full temperature and pressure. The Unit was in preparation for startup. At approximately 0800, Operations (OPS) personnel began performing procedure PT/1/A/4350/02B, Diesel Generator (DG) [EIS:DG] 1B Operability Test. This is a normal surveillance test to ensure DG operability which is performed on a monthly basis. All prerequisites had been verified and the OPS personnel were proceeding with step 12.3 of the procedure which states:

"**IF** Unit 1 conditions allow, perform Enclosure 13.5 (Check Of Diesel Generator 1B Cylinders For Fluid) prior to Diesel Generator start."

As a part of this step, the DG had been logged as "Inoperable" by OPS Control Room [EIS:NA] personnel at 0849, and the OPS personnel in the DG Room opened the Control Power Breaker [EIS:BKR] for the DG Control Panel to prevent the DG from starting. Mechanical Maintenance personnel had then engaged the turning gear and verified that no fluid was discharged from any cylinder while barring the DG over. This part of the test being completed satisfactorily, Mechanical Maintenance personnel disengaged the turning gear, and at 0856, OPS personnel in the DG Room reclosed the Control Power Breaker, rendering the DG operable.

At that time, DG 1B started with no Operator action to have caused the start. OPS Control Room personnel verified that there was no signal from the Engineered Safety Features Actuation (ESFA) system [EIS:JE] to have caused an automatic start of the DG. A check of the Control Room Events Recorder [EIS:IQ] indicated the start relays [EIS:RLY] had closed 200 milliseconds prior to the start. No work was in progress which should have caused these relays to actuate. No equipment grounds were found to be present. The Control Board Selector Switch for the DG was in the Control Room (Auto) position. Having verified that no valid ESFA system signal existed to cause a start of the DG, OPS Control Room personnel set the Control Board Selector Switch to the Control Room (Manual) position and proceeded to shut down the DG at 0858. The DG did not align to the Bus [EIS:BU].

Work Order (WO) 94081240 was generated for Instrumentation And Electrical (IAE) personnel to investigate the circuitry associated with control of the DG to determine if any problems existed. IAE personnel along with OPS and Engineering personnel investigated the DG control circuitry. No problems could be found with the circuitry to have caused the DG start. Attempts to create a duplication of the exact scenario did not cause a repeat of the inadvertent start. Subsequently, the procedure for verification of DG 1B operability was run in its entirety. The DG responded correctly and, since no problems or reasons for inoperability could be found, the DG was declared operable.

Evaluation and testing has continued with all wiring, relaying, and electrical circuitry associated with the DG start controls verified to be correct and operable. IAE and Engineering personnel verified that no equipment grounds exist associated with the DG circuitry nor is there any indication of equipment shorts or grounds at the time of the event. Engineering personnel postulated scenarios possible in which there would be multiple grounds or shorts associated with the DG circuitry with a combined impedance higher than that detectable by the ground detection equipment. Analysis of these scenarios concluded that the current drawn by the circuitry through any such ground would be significantly less than that required to actuate the DG start relaying. IAE, OPS, and Engineering personnel verified that the circuit logic will not allow a Manual DG start with the Control Room Selector Switch in the Auto position, and that if an auto start signal is present, the DG will start and can not be shut down from the Control Room until the start

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signal is removed. The Control Power Breaker was cycled an additional six times with no inadvertent DG starts. In short, no reason for the inadvertent actuation of the DG start circuitry were found.

**Conclusion**

This event has been assigned a cause of Unknown, Possible Equipment malfunction since, after extensive testing and verification, no reason could be determined for the inadvertent actuation of the DG start circuitry.

Subsequent investigation has found no problems with the procedure or the performance thereof on October 24. The personnel involved with the performance of the procedure on that date are qualified to this task and have performed the task successfully many times. No problems were found with the wiring, circuitry hardware, or logic associated with the startup controls for Unit 1B DG. It was verified that no other activities were in progress at the time of the event which could have caused a start of the DG. Subsequent tests have verified operability of the DG controls and have not revealed any problems nor recurrence of an inadvertent start. No other DG at McGuire has experienced such a start and attempts to create a duplication of the inadvertent start have not been successful on either DG 1B or 1A. This procedure has been performed on a monthly basis on all DGs at McGuire with no similar problems occurring.

A leading expert in the area of control circuitry, from the Duke Power Company General Office Staff, has performed an independent review of the circumstances surrounding the event, all pertinent control circuitry drawings, computer and events recorder printouts from the time of the event, and the subsequent troubleshooting activities performed to date. After his review, he concluded that the inadvertent DG start could be the result of a momentary malfunction which has not reappeared during numerous attempts to recreate the exact conditions present at the time of the event. Therefore, by process of elimination, it is suspected that the inadvertent start could be the result of an undetermined closure of the DG manual start circuitry. The results of this independent evaluation coincide with the conclusion reached by McGuire personnel.

A review of the Problem Investigation Process (PIP) data base for the past 24 months revealed no events associated with uninitiated starts of the DGs or Engineered Safety Features actuations on any system due to an unknown cause. This event is not considered to be recurring.

This event did not result in any uncontrolled releases of radioactive material, personnel injuries, or radiation overexposures.

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

**CORRECTIVE ACTION:**

Immediate:

1. OPS personnel determined that no ESF signal had occurred to cause the start of the DG, set the Control Board Selector Switch to the Control Room (Manual) position, and shut down the DG.

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**Subsequent:**

1. A WO was generated to have IAE personnel investigate the control circuitry for the DG to determine if any problems existed.
2. IAE personnel in conjunction with OPS and Engineering personnel investigated the circuitry associated with 1B DG.

**Planned:**

1. Engineering personnel will evaluate the troubleshooting actions taken to date and determine if additional actions are warranted.

**SAFETY ANALYSIS:**

The Standby DG is required to supply emergency AC power to equipment required to safely shut down the reactor [EIS:RCT] in the event of loss of normal power. During this event, the DG started inadvertently during performance of a test to verify operability. At no time was the DG in a situation which would have jeopardized ability to perform the intended safety function. Subsequent testing has proven that no faults exist which render the DG inoperable. At no time during this event was offsite power unavailable. Also, during this time period the remaining DG for Unit 1 was fully operable and capable of performing the intended safety function. Based on this analysis, this event is not considered to be significant.

At no time were the health and safety of the public or plant personnel affected by this event.