10CFR50.73

William S. Orser Vice President Nuclear Operations

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Nuclear Operations

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August 7, 1989 NRC-89-0135

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

Reference: Fermi 2 NRC Docket No. 50-341 Facility Operating License No. NPF-43

Subject: Licensee Event Report (LER) No. 89-015-00

Please find enclosed LER No. 89-015-00, dated August 7, 1989, for a reportable event that occurred on July 7, 1989. A copy of this LER is also being sent to the Regional Administrator, USNRC Region III.

If you have any questions, please contact Patricia Anthony at (313) 586-1617.

Sincerely. Duzim for Willie S. Okser

Enclosure: NRC Forms 366, 366A

cc:

J. R. Eckert R. C. Knop W. G. Rogers

A. B. Davis

J. F. Stang

Wayne County Emergency Management Division

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Out July 7, 1989, power was lost to the Division I Reactor Protection System bus A when its motor generator set experienced an overvoltage condition. Investigation revealed that voltage meter readings had drifted up from 120 volts to 128 volts following adjustment of the potentiometer. Additionally, a problem with the stability of the installed voltage meter indication was identified. Both the potentiometer and the voltage meter were replaced prior to placing the MG set back in service. On July 18, 1989, a similar event occurred. Troubleshooting was commenced, but a cause for this problem has not yet been identified. The voltage regulator was replaced on July 18, 1989. While the MG set was running for test, a voltage fluctuation occurred on July 19, 1989. Testing is in progress in order to determine the cause of this event. Several MG set parameters are being continually monitored. Following determination of the root cause for these events, a supplement to this LER will be submitted with a supplement to this LER will be submitted	CAUSE SYSTEM COMPO	ONENT MANUFAC	REPORTABLE TO NPRDS			CAUSE	SYSTEM	COMPONENT	MANUFAC TURER	REPO	ORTABLE NPRDS	****		
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TEXT (If n'ore space is required, use additional NRC Form 366A's) (17)

Initial Plant Conditions:

Operational Condition: 1 (Power Operation) Reactor Power: 98.4 percent Reactor Pressure: 1000 psig Reactor Temperature: 545 degrees Fahrenheit

Description of Occurrence:

On July 7, 1989 an operator on rounds found the MG set A voltage meter (MTR) reading 113 volts and adjusted the potentiometer (FD) so that the meter read 120 volts (potentiometer setting 8.1) at approximately 0800 hours that day. At 1821 hours, the Division I equipment protection assembly (EPA) breakers (BKR) tripped on overvoltage which resulted in a loss of power to Division I Reactor Protection System [(RPS)(JC)] bus A (BU). A half scram was received. All the Division I actuations and isolations that should have occurred as a result of this event did occur. These included starting of the Standby Gas Treatment System and tripping of the Reactor Building Heating, Ventilating and Air Conditioning System, isolation of the Reactor Water Cleanup System and shifting of the Control Center Heating, Ventilating and Air Conditioning System to recirculation mode.

At 1839 hours, the RPS bus A was transferred from its motor generator (MG) set to its alternate power supply in order to re-energize it. The half fram was reset and operators restored the actuated systems to their normal condition. The RPS MG set A was shutdown at 2143 hours and subsequently tagged out for repairs. At the time of the overvoltage trip, the potentiometer was still set at 8.1, but the voltage meter read 128 volts. It was suspected that the potentiometer was not functioning properly and it was replaced at approximately 2330 hours.

On July 8, 1989 at approximately 0100 hours, MG set A was started but not loaded. The voltage was adjusted to 120 volts, which was a potentiometer setting of 8.3. At 0157 hours, an operator on rounds reported that the RPS MG set A voltage meter was reading 128 volts. Investigation of the voltage meter at that point determined that tapping on face of the voltage meter caused the readings to fluctuate between 113 volts and 128 volts. At the same time, a volt-ohm meter (VOM) being used to monitor the same

NRC Form 366A (8-83)	LICENSEE EVENT REPORT (LER) TEXT CONTINUATION						ULATORY COMMISSION MB NO. 3150-0104 /88		
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output remained steady at 128 volts. The potentiometer was adjusted to 7.1 which translated to 120 volts on both the voltage meter and the VOM at approximately 0230 hours. At approximately 1400 hours, a line analyzer was installed on the meter and the MG set was left unloaded.

After a week of unloaded operation without identifying any further problems, the MG set was shutdown and the voltage meter replaced. The newly installed voltage meter read 113 volts when the potentiometer was set at 7.1 and the MG set was running unloaded. The potentiometer was adjusted to 8.25 which translated to 120 volts on both the voltage meter and the VOM.

There were no other problems found while running the M' of unloaded for the next two days, so the MG set was retuined to service at 2112 hours on July 17, 1989. After loading, the voltage meter reading was 119 volts. The potentiometer was adjusted to 8.4 in order to bring voltage on the bus to 120 volts. The round's readings from the next shift (midnights) indicated the MG set was operating normally at 120 volts.

At 0748 hours on July 18, 1989, the Division I EPA breakers again tripped and the RPS MG set A voltage meter read 130 volts. Troubleshooting of the problem commenced. At 0955 hours, the potentiometer was found to be still set at 8.4, but the voltage reading was 129.5 volts on voltage meter and 129 on the VOM. The potentiometer was adjusted to 7.1 which translated to 120.5 volts on the voltage meter and VOM. A temperature test was performed using a heat gun to see if increasing temperatures caused significant changes in the voltage output. None of the components appeared to be significantly affected; the voltage increase was not greater than that expected due to the temperature increase in any case. The MG set was shutdown and started again without problem. Finally, it was shutdown and the voltage regulator replaced. At 2130 hours, the MG set was started unloaded. The potentiometer was adjusted to 6.2 in order to obtain an output of 120 volts.

On July 19, 1989, at approximately 0800 hours, the output voltage was found to be 115 volts with the potentiometer still set at 6.2. It was adjusted to 6.8 in order to bring output voltage to 120 volts. Testing of the MG set under varying conditions was conducted in an attempt to determine the cause of the intermittent problem. At 1040 hours, the MG set was shutdown to install a resistance load bank, a line analyzer and a VOM at the voltage meter. The results were as follows:

NRC Form 366A U.S. NUCLEAR REGULATORY COMMISSION LICENSEE EVENT REPORT (LER) TEXT CONTINUATION APPROVED OMB NO. 3150-0104 EXPIRES: 8/31/88 FACILITY NAME (1) DOCKET NUMBER (2) LER NUMBER (6) PAGE (3) NUMBER NUMBER YEAR Fermi 2 0 5 0 0 0 3 4 1 8 9 0 01001 40F10 16 1115 TEXT (If more space is required, use additional NRC Form 366A's) (17) Potentiometer Action Time VOM Voltage Meter 6.8 Started and loaded with 1050 119 120 110 amps Unloaded 1051 6.8 Loaded with 50 amps 1105 119 120 Shutdown; allowed to 1140 coast to almost stopped condition Loaded with 50 amps, 120 6.8 1235 119 unloaded and shutdown Installed original 1300 voltage regulator 118 6.8 Started and loaded at 50 117 1305 amps 1310 127 130 8.3 Increased voltage with potentiometer Decreased voltage with 110 5.5 1312 109 potentiometer Increased voltage with 1320 119 120 7.1 potentiometer Increased load to 100 7.1 1322 119 120 amps for one minute Unloaded 120 7.1 1330 119 Loaded 50 amps, then 100 120 7.1 1331 119 amps and shutdown Performed temperature 1335 test with heat gun; no significant voltage increase Completed temperature 1350 119 7.1 120 test; shutdown MG set

NRC Form 366A (9-83)	LI	CENSEE EVENT REPOR	RT (LER) TEXT CONTIN	U.S. NUCLEAR REGU UATION APPROVED OM	B ND. 3150-0104
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1450				Shutdown the MG set	:
1500				Re-installed new vo regulator	oltage
1510	123	124	7.1	Started MG set	
1510	120	121	6.9	Adjusted the potentiometer	
1515	120	121	6.9	Loaded with 50 amps	; left

At 1710 hours, the line analyzer recorded voltage cycles between 112 volts and 130 volts in which the minimum and maximum peaks were maintained for a short duration. The cycling continued for approximately 40 minutes before stabilizing at 120 volts.

On July 21 through 31, 1989, checks of the output voltage revealed nothing abnorm ...

Cause of Event:

The investigation into the cause of this problem is still ongoing. Testing of the RPS MG set A at varying amperage and voltage levels will be performed in order to determine the cause of the intermittent voltage drift. Monitoring of various MG set parameters is presently in progress in order to detect the problem. Once the root cause is determined, a supplemental LER will be submitted within thirty days.

Analysis of Event:

The engineered safety features challenged on both July 7 and 18, 1989, responded per their design. This event did not impair the ability of the Division I RPS EPA safety features to protect the reactor and the health and safety of the public. Had an event occurred requiring protection of the vessel during either RPS MG set A overvoltage trip, the safety features would have already been fulfilling or have been capable of performing their functions.

MG set running loaded

(9-63) LICEN	E EVENT REPORT (LER) TEXT CONTIN	U.S. NJCLEAR UATION APPROV EXPIRES:	REGULATORY COMMISSION ED OMB NO. 3150-0104 8/31/88
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Corrective Actions:

As described previously, the voltage meter, the potentiometer and the voltage regulator on the MG set have been replaced. In addition, monitoring of the following parameters is in progress: generator output voltage, exciter field current, voltage regulator temperature, regulator reference voltage, field voltage and the voltage across one of the contacts. Multiple tests of the MG set at varying amperage levels will be performed in order to determine the cause of the drifting voltage levels.

Previous Similar Events:

Licensee Event Report 87-040 described another event in which RPS MG set A tripped due to an overvoltage condition. While a conclusive root cause was not found, it was suspected that the potentiometer may have had contaminants on it which were "wiped off" by exercising the potentiometer during troubleshooting. A preventive maintenance event requiring exercising the potentiometer was developed to address this event.