



**SYSTEM ENERGY
RESOURCES, INC.**

A Middle South Utilities Company

WILLIAM T. COTLE
Vice President
Nuclear Operations

August 21, 1989

U.S. Nuclear Regulatory Commission
Mail Station PL-137
Washington, D.C. 20555

Attention: Document Control Desk

Gentlemen:

SUBJECT: Grand Gulf Nuclear Station
Unit 1
Docket No. 50-416
License No. NPF-29
Reactor Scram Caused by
Lightning Strike
LER 89-010-00
AECM-89/0155

Attached is Licensee Event Report (LER) 89-010-00 which is an interim report.

Yours truly,

WTC:cg
Attachment

cc: Mr. D. C. Hintz (w/a)
Mr. T. H. Cloninger (w/a)
Mr. J. G. Cesare (w/o)
Mr. R. B. McGehee (w/a)
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NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3180-0104

EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Grand Gulf Nuclear Station _ Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 4 1 5	PAGE (3) 1 OF 0 4
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TITLE (4) Reactor Scram Caused by Lightning Strike

EVENT DATE (6)			LER NUMBER (8)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (9)																																																	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES		DOCKET NUMBER(S)																																															
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LICENSEE CONTACT FOR THIS LER (12)

NAME Ronald Byrd / Licensing Engineer	TELEPHONE NUMBER 6 0 1 4 3 7 - 2 1 8 2
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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)

<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15) MONTH DAY YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On July 22, 1989, a severe electrical storm passed over Grand Gulf Nuclear Station. During the storm, the reactor automatically scrambled due to a high neutron flux signal on the Average Power Range Monitors (APRMs). Additionally, a spike to the Reactor Core Isolation Cooling (RCIC) system logic caused RCIC to automatically actuate and inject into the reactor vessel. Reactor water level decreased to -15 inches and was raised to the level 8 high level trip (+53.5 inches) in approximately 2 minutes.

A channel check of APRM indications was performed during plant restart on July 23, 1989 to confirm proper response. No abnormalities were observed. System Energy requisitioned a specialist in lightning protection to perform a plant survey and study of the existing plant lightning protection system. The contractor has submitted proposals to provide lightning dissipation arrays on vulnerable structures. System Energy is presently evaluating implementation methods and constructing a schedule for implementation. Current progress indicates that implementation will likely be completed by December 31, 1989. In any case, implementation will be completed no later than the startup from the fourth refueling outage (RFO4).

NRC Form 305a
(5-83)

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/86

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

TEXT (If more space is required, use additional NRC Form 305a's) (17)

A. Reportable Occurrence

On July 22, 1989, the reactor automatically scrambled due to a lightning induced spike on the Average Power Range Monitors (APRMs). This Reactor Protection System (RPS) actuation is reported pursuant to 10CFR50.73(a)(2)(iv).

B. Initial Conditions

The plant was operating at approximately 100 percent power at the time of occurrence,

C. Description of Occurrence

On July 22, 1989, a severe electrical storm passed over Grand Gulf Nuclear Station. At 1723 during the storm, the reactor automatically scrambled due to a high neutron flux signal on the APRMs (EIIS code: IG). All APRM channel upscale alarms annunciated and immediately cleared. Evaluation of the event revealed that the APRM high neutron flux signal lasted less than one-tenth of a second. Additionally, a spike to the Reactor Core Isolation Cooling (RCIC) system (EIIS code: BN) logic, simulated a low water level signal and caused RCIC to automatically actuate.

Following the scram, the reactor water level decreased to approximately -15 inches but was raised to level 8 (+53.5 inches) at 1725 by the RCIC injection. Prior to reaching level 8, operators decreased RCIC injection flow and secured reactor feed pump "B". When level 8 was reached, the RCIC injection valve automatically closed and the "A" Reactor Feed Pump Turbine tripped as designed. The reactor water level decreased below level 8 at 1731. Reactor Feed Pump "A" was restarted at 1734.

D. Apparent Cause

The RPS actuation and subsequent reactor scram were caused by an initiation signal from 7 of 8 APRM channels. The trip function of the APRMs is set to occur when core thermal power reaches 118 percent instantaneously. Review of computer traces indicate that channel B spiked to approximately 118 percent. Considering the accuracy of the traces, it is concluded that the trip setpoint for channel B was not reached.

NRC Form 306A
(5-83)

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (5)			PAGE (3)	
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Grand Gulf Nuclear Station - Unit 1	0500041689	01	0	0	03	OF 04

TEXT (If more space is required, use additional NRC Form 306A's) (17)

The approximate peak indicated flux for each channel is as follows:

APRM Channel	Peak Indicated Flux
A	126%
B	118%
C	126%
D	140%
E	123%
F	123%
G	134%
H	140%

The Post Trip Analysis concluded that the cause of the instrumentation signal spikes was an induced voltage and/or ground potential spike caused by lightning activity at the site.

A previous similar event was reported in LER 88-012. The cause of the APRM spikes for that event was determined to be a fence grounding strap that was routed in close proximity to conduit containing Division 3 and 4 APRM signal cables. The grounding straps for the fence were relocated and evaluations for final resolution continued. Final resolution had not been completed at the time of the July 22, 1989 occurrence.

E. Supplemental Corrective Actions

A channel check of APRM indications was performed during plant restart on July 23, 1989 to confirm proper response. No abnormalities were observed.

The fence located on the roof of the Control Building and Turbine Building was dismantled as a precautionary measure. An inspection of the fence revealed no evidence of it having been struck by lightning.

System Energy requisitioned a specialist in lightning protection to perform a plant survey and study of the existing plant lightning protection system. The contractor has submitted proposals to provide lightning dissipation arrays on vulnerable structures. System Energy is presently evaluating implementation methods and constructing a schedule for implementation. Current progress indicates that implementation will likely be completed by December 31, 1989. In any case, implementation will be completed no later than the startup from the fourth refueling outage (RFO4).

NRC Form 296a
(5-83)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OME NO. 3150-0104

EXPIRES: 8/31/88

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (C)			PAGE (3)	
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER		
Grand Gulf Nuclear Station - Unit 1	415	89	010	00	04	OF 04
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TEXT (If more space is required, use additional NRC Form 296a's) (17)

F. Safety Assessment

The Post Trip Analysis confirmed that all safety systems functioned properly and that plant response to these automatic actions was as expected. RPS response times were satisfactory when compared to expected or required times. Reactor water level remained at least 151 inches above the top of active fuel during the event. All Emergency Core Cooling Systems were operable but were not required to be automatically or manually initiated.