



Entergy Operations, Inc.
P.O. Box 756
Port Gibson, MS 39150
Tel 601 437 2800

June 16, 1993

C. R. Hutchinson
Vice President
Operations
Grand Gulf Nuclear Station

U.S. Nuclear Regulatory Commission
Mail Station P1-137
Washington, D.C. 20555

Attention: Document Control Desk

SUBJECT: Grand Gulf Nuclear Station
Unit 1
Docket No. 50-416
License No. NPF-29
Topaz Inverter Failure Results in Isolation of
Containment Isolation Valve
LER 93-004-00

GNRO-93/00073

Gentlemen:

Attached is Licensee Event Report (LER) 93-004 which is a final report.

Yours truly,

CRH/RR/
attachment

cc: Mr. R. H. Bernhard(w/a)
Mr. H. W. Keiser(w/a)
Mr. R. B. McGehee (w/a)
Mr. N. S. Reynolds (w/a)
Mr. H. L. Thomas (w/o)

Mr. Stewart D. Ebnetter (w/a)
Regional Administrator
U.S. Nuclear Regulatory Commission
Region II
101 Marietta St., N.W., Suite 2900
Atlanta, Georgia 30323

Mr. P. W. O'Connor
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Mail Stop 13H3
Washington, D.C. 20555

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NRC Form 366
(9-82)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO 3150-0104
EXPIRES 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Grand Gulf Nuclear Station	DOCKET NUMBER (2) 0 5 0 0 0 4 1 6 1	PAGE (3) 1 OF 0 8
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TITLE (4)
Topaz Inverter Failure Results in Isolation of Containment Isolation Valve

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)							
0	5	1	7	9	3	9	3	0	0	4	1	6	1	0	0	0	0	
												0	5	0	0	0		
												0	5	0	0	0		

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following): (11)										
	20.402(b)	20.406(c)	<input checked="" type="checkbox"/>	50.73(a)(2)(iv)	73.71(b)						
POWER LEVEL (10) 11010	20.406(a)(1)(ii)	50.38(c)(1)		50.73(a)(2)(v)	73.71(c)						
	20.406(a)(1)(ii)	50.38(c)(2)		50.73(a)(2)(vi)	OTHER (Specify in Abstract below and in Text NRC Form 366A)						
20.406(a)(1)(iii)	50.73(a)(2)(i)		50.73(a)(2)(vii)								
20.406(a)(1)(iv)	50.73(a)(2)(ii)		50.73(a)(2)(viii)(A)								
20.406(a)(1)(v)	50.73(a)(2)(iii)		50.73(a)(2)(viii)(B)								
20.406(a)(1)(vi)	50.73(a)(2)(iv)		50.73(a)(2)(ix)								

LICENSEE CONTACT FOR THIS LER (12)											
NAME Riley Ruffin / Licensing Specialist								TELEPHONE NUMBER			
								AREA CODE 6 0 1			
								4 3 7 - 2 1 6 7			

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)										
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRRDS	
X		INVERT	T124B	N						

SUPPLEMENTAL REPORT EXPECTED (14)								EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input type="checkbox"/> YES (if yes, complete EXPECTED SUBMISSION DATE)								<input checked="" type="checkbox"/> NO			

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

On May 17, 1993, the Inboard Containment Isolation Valve which supplies steam to the Reactor Core Isolation Cooling (RCIC) System automatically isolated. The isolation is attributed to the erratic behavior of a division 2 trip unit inverter. The associated trip units generated trip signals to several division 2 card files. This resulted in the RCIC System actuating and immediately isolating. RCIC did not inject into the vessel. Vessel level remained within normal operating limits during this occurrence. Operations personnel declared RCIC inoperable and the appropriate technical specification actions were taken. The malfunction of the inverter did not degrade the ability of other safety systems to perform their intended functions. The health and safety of the public were not compromised during this occurrence.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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

A. Reportable Occurrence

On May 17 and 18, 1993, a division 2 Containment Isolation valve isolated due to a signal from the Leak Detection System. This occurrence is reportable pursuant to 10 CFR 50.73(a)(2)(iv).

B. Initial Conditions

The plant was in Operational Condition 1 at approximately 100 percent thermal power. Reactor temperature was approximately 530 degrees F at the time of occurrence.

C. Description of Occurrence

On May 17, 1993 at 2200 hours, a momentary spike occurred on ECCS division 2 trip unit inverter 1E12K701. Additionally, there were two recurrences on May 18. The momentary power failures resulted in a loss of power for division 2 ECCS trip unit power distribution located in control room panel 1H13P618.

The power losses caused several trip units to be deenergized. Among these units were several vessel water level units. A gross failure occurred and a false low water level (-41 inches) initiation signal was generated. The steam inlet valve for the Reactor Core Isolation Cooling (RCIC) System [BN] turbine responded which resulted in an initiation of the division 1 Standby Service Water System [BI].

Several trip units for the Leak Detection System also were deenergized as a result of the power loss. Gross failures occurred on trip units associated with "Steam Line High Differential Pressure" and caused an erroneous leakage signal to be generated. The inboard Containment Isolation Valve 1E51F063 isolated as a result of the signal.

Within one second of the RCIC actuation, an isolation occurred. Therefore RCIC did not inject into the reactor vessel.

In each case, RCIC was declared inoperable and the appropriate technical specification action taken. Preliminary troubleshooting did not reveal problems with the inverter.

Following the third occurrence, the inverter was replaced and on May 19, 1993, the system was restored to the OPERABLE condition.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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TEXT (If more space is required, use additional NRC Form 388A's) (17)

D. Apparent Cause

Following the incident, an investigation was performed to identify causal factors. Two causal factors were identified as a result of the analysis.

The existing maintenance program does not address periodic replacement of these inverters. A review of the failure history of the failed inverter indicated that the component failures occurred on an approximate frequency of six years.

Maintenance calibration instructions which currently verify the performance of the Topaz inverters may not have adequately tested the output voltage of inverters. The instructions directed testing to be performed in a no-load condition. However, this method may not identify incipient failure of components due to aging effects.

E. Corrective Action

A review of current calibration instructions and PM program will be performed in order to determine if current inverter testing methods and PM program warrant changes.

F. Safety Assessment

All systems responded as designed. Vessel water level remained within normal operating limits (402 inches above TAF) as indicated by narrow range level recorder 1C34R615. This occurrence did not degrade the ability of any Engineered Safety Feature system to perform its intended function. The health and safety of the public was not compromised at any time during this occurrence.

G. Additional Information

Energy Industry Identification System (EIIS) codes are identified in the text within [].