

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Grand Gulf Nuclear Station - Unit 1	DOCKET NUMBER (2) 0   5   0   0   0   4   1   6	PAGE (3) 1 OF 04
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TITLE (4)  
ESF Actuations Due to Vessel Level Transient

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)						
1	1	2	8	4	0	5	3	0	1	0	2	2	8	8	5	NA	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)									
POWER LEVEL (10) 0   5   3	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)						
	<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(e)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)						
	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.38(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	<input checked="" type="checkbox"/> OTHER (Specify in Abstract below and in Text, NRC Form 366A)						
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	Special Report						
	<input type="checkbox"/> 20.405(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)							
	<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)							

LICENSEE CONTACT FOR THIS LER (12)		TELEPHONE NUMBER	
NAME Ronald W. Byrd/License Engineer		AREA CODE 6   0   1	6   0   1   4   3   7   -   2   1   4   9

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)										
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

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)

Defective special test equipment and a mislanding of the ground lead from the test equipment during a feedwater system test resulted in a reactor vessel level transient. Various ESF systems actuated including a manually initiated reactor scram and an injection by the High Pressure Core Spray system.

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## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER			
		8   4	-   0   5   3	-   0   1	0   2	OF	0   4

TEXT (if more space is required, use additional NRC Form 366A's) (17)

Description of Reportable Occurrence

On November 29, 1984, a reactor manual scram was initiated during a vessel level transient. Various ESF systems actuated including an injection by the High Pressure Core Spray (HPCS) system. An unusual event was declared and notifications were made to offsite agencies despite a malfunction of the Emergency Notification System.

Initial Conditions

The plant was operating at approximately 53 percent power with the vessel level at 36 inches. The condensate and feedwater systems were in operation for feedwater system testing during startup test condition 2 with the "A" feed pump in manual control with test equipment connected to the automatic control circuit and the "B" feed pump control in automatic.

Status of Redundant or Backup Systems

High Pressure Core Spray and the Reactor Core Isolation Cooling (RCIC) systems were operated during the level transient.

Nature of Occurrence

During the feedwater system testing, defective special test equipment and an incorrect connection caused an erroneous input to the "B" feedwater pump controller resulting in a large feedwater flow decrease and a rapid decrease in the reactor vessel water level. An operator quickly took manual control of the "B" feed pump and stopped the level decrease by increasing feedwater flow. The minimum level reached approximately +19 inches. As the vessel level reached normal, the operator began matching feedwater flow with the steam flow. It is suspected that the rapid increase in feedwater flow caused the condenser hotwell level to decrease to the point where the condensate pumps tripped either on low suction pressure or low hotwell level.

At approximately 0055 hours, with a loss of all condensate flow, the Shift Superintendent ordered that the reactor be manually scrammed. The vessel level decreased rapidly. The RCIC system was manually initiated near its automatic actuation setpoint (-41.6 inches) approximately 12 seconds after the scram. The HPCS pump automatically started about 4 seconds later. Other automatic actions which took place were: the Auxiliary Building and Containment isolated, Standby Gas Treatment trains A and B initiated, the Control Room Ventilation System shifted to the isolation mode, the reactor recirculation pumps tripped to the LFMG, and the reactor water cleanup system isolated.

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

The level reached a minimum of -49 inches. When the level was restored to -20 inches and rising, approximately 30 seconds after HPCS began injecting, the HPCS injection valve was closed to reduce the rapid rise in vessel level and to limit the cooldown rate, yet allowing the HPCS pump to continue running. Shortly thereafter the HPCS/RCIC suction shifted from the condensate storage tank (CST) to the suppression pool. This action was due to a sensed low CST level caused by pressure oscillation when the injection valve was closed.

About 4 minutes into the event, the RCIC turbine tripped for no apparent reason, but was immediately restarted. At 0104 hours, the Condensate and Condensate Booster pumps were restarted to maintain normal vessel level.

#### Immediate Corrective Action Taken

The plant systems were placed in normal configuration by 0127 hours on November 29.

#### Apparent Cause

A special test was performed recreating the conditions of the startup test to understand the cause of the level transient. This special test revealed that a combination of the defective special test equipment and a mislanding of the ground lead from the test equipment resulted in grounding the input to the "B" feed pump speed controller. The "B" feed pump slowed down causing the decrease in feedwater flow. Personnel involved were technicians and engineers, both utility and contract personnel. | 1

The cause of the RCIC trip remains undetermined. A review of computer data recorded during the transient show system parameters well below trip setpoints. A subsequent investigation included: a check of instrument trip setpoints, an inspection and test of the RCIC turbine trip/throttle valve, and monitoring system operation. No abnormalities were observed. The trip is considered to be an isolated incident. | 1

#### Supplemental Corrective Action

Modifications and repairs have been made to the special test equipment to eliminate the possibility for a recurrence of grounding identical to the one which caused the level transient.

To enhance the condensate pump reliability, the condensate pump startup suction strainers and the low suction pressure trip have been removed.

The time constant on the pressure transmitter for the HPCS/RCIC suction path transient has been increased to help eliminate spurious transfers.

A training session was held for engineers involved in startup testing on the installation, operation and use of this special test equipment.

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Memorandums have been issued by Plant Management to all Supervisors/ Superintendents reiterating that independent verifications be performed in series for modifications that require verifications. The startup test procedure has been modified to provide better control of independent verification during installation and removal of test equipment.

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Additional Information

The HPCS injection was the first system actuation cycle while the reactor was critical. Two injections occurred in August of 1982 while in the refueling mode. A second actuation during reactor operation occurred in January 29, 1985 (see LER 85-002). This information is provided in accordance with Action h of Technical Specification 3.5.1.

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February 28, 1985

NUCLEAR LICENSING & SAFETY DEPARTMENT

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

Gentlemen:

SUBJECT: Grand Gulf Nuclear Station  
Unit 1  
Docket No. 50-416  
License No. NPF-29  
File: 0260/L-835.0  
ESF Actuations Due to Vessel  
Level Transient  
LER 84-053-1  
AECM-85/0066

Attached is Licensee Event Report (LER) 84-053-1 which is a final report.

Yours truly,

L. F. Dale  
Director

EBS/SHH:vog  
Attachment

cc: Mr. J. B. Richard (w/a)  
Mr. R. B. McGehee (w/a)  
Mr. N. S. Reynolds (w/a)  
Mr. G. B. Taylor (w/o)

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