

NRC Form 306
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

EXPIRES 8/31/85

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 3									
TITLE (4) Forced Shutdown Due to RHR Pipe Support Deficiencies																							
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 NA				DOCKET NUMBER(S) 0 5 0 0 0										
0	5	0	2	8	4	8	4	0	2	4	0	1	0	8	0	8	8	4	0	5	0	0	0
OPERATING MODE (9) 2		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)																					
POWER LEVEL (10) 0 0 4		20.402(b)				20.406(e)				50.73(a)(2)(iv)				73.71(b)									
		20.406(a)(1)(i)				50.38(e)(1)				X 50.73(a)(2)(v)				73.71(e)									
		20.406(a)(1)(ii)				50.38(e)(2)				50.73(a)(2)(vii)				OTHER (Specify in Abstract below and in Text, NRC Form 306A)									
		20.406(a)(1)(iii)				X 50.73(a)(2)(i)				50.73(a)(2)(viii)(A)													
		20.406(a)(1)(iv)				50.73(a)(2)(ii)				50.73(a)(2)(viii)(B)													
		20.406(a)(1)(v)				50.73(a)(2)(iii)				50.73(a)(2)(ix)													
LICENSEE CONTACT FOR THIS LER (12)																							
NAME Ronald W. Byrd/Licensing Engineer										TELEPHONE NUMBER 6 0 1 1 4 3 1 7 - 1 2 1 1 4 9													
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																							
CAUSE	SYSTEM	COMPONENT	MANUFAC. TUNER	REPORTABLE TO NPDOS		CAUSE	SYSTEM	COMPONENT	MANUFAC. TUNER	REPORTABLE TO NPDOS													
X	B	I	O	P	I	S	E	T	1	1	6	1											
						B	B	I	O	S	P	I	T	1	1								
X	B	I	O	P	I	S	E	T	1	1	6	1											
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)

A plant shutdown was completed on May 2, 1984, as required by the GGN3 Technical Specifications, due to the inoperability of both independent Containment Spray loops of the Residual Heat Removal (RHR) system. The RHR B loop was declared inoperable on April 30, when two cracks were found in a 3 inch diameter branch pipe off the main RHR B loop header. On May 2, pipe support deficiencies resulted in both RHR loops being declared inoperable and the subsequent shutdown. The event was declared an Unusual Event at 1800 hours on May 2 and the Nuclear Regulatory Commission (NRC) was notified at 1822 hours.

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NRC Form 388A
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/86

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

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

On May 2, 1984, at 2225 hours, the plant entered Hot Shutdown as required by action (b) of Technical Specification 3.6.3.2 due to the inoperability of both independent loops of the Containment Spray mode of the Residual Heat Removal System. The event was declared an Unusual Event at 1800 hours on May 2 and the Nuclear Regulatory Commission (NRC) was notified at 1822 hours. The sequence of events which lead to the shutdown are as follows.

On April 30, 1984, at 1645 hours, two cracks were found in a 3 inch diameter pipe which branches off the RHR B loop. This pipe allows the Reactor Core Isolation Cooling System (RCIC) to take suction from the RHR heat exchangers. The pipe has a primary pressure rating of 300 psi, is made of carbon steel and designed to meet ASME Boiler and Pressure Vessel Code Section III, Class 2. One crack was found at a 90 degree elbow just prior to valve F065. The other was in a weld-o-let fitting at the junction of the 3 inch branch line and the 18 inch diameter RHR loop B pipe. The distance between valve F065 and the branch connection is approximately 2.5 feet. As a result of the findings, Limiting Conditions for Operations (LCOs) were entered under Technical Specification 3.5.1, 3.6.3.2, and 3.6.3.3 after declaring LPCI "B", Containment Spray "B", and the Suppression Pool Cooling Mode of RHR B inoperable.

Subsequent special inspections were then conducted which revealed RHR system pipe support nonconformances at 1800 hours on May 2, 1984. One support base plate had loose nuts on the mounting bolts and two plates appeared to have been pulled away from the wall approximately 0.25 to 0.75 inches. Since the structural integrity of the supports were in question, RHR loops A and B including Containment Spray, LPCI, Suppression Pool Cooling, and Shutdown Cooling modes were declared inoperable. Per action (b) of Technical Specification 3.6.3.2, the plant was placed in Hot Shutdown at 2225 hours on May 2 and in Cold Shutdown at 0745 hours on May 3. Reactor Recirculation pumps A and B were used as an alternate method of reactor coolant circulation. The Reactor Water Cleanup System and the Control Rod Drive System were also available for heat removal.

The damaged 3 inch pipe was removed and a temporary capped 6 inch weld-o-let connection was attached to the 18 inch pipe to restore the RHR B loop. Flow tests were performed on May 4 by throttling valve F003 immediately downstream of the branch connection on the 18 inch RHR pipe. Vibration measurements taken showed some excessive vibration when the F003 valve was throttled to less than 15 percent of the fully closed position. A change to the operating procedures was made to prevent the F003 valve from being throttled to 15 percent or less of the fully closed position.

Two of the pipe supports were reworked, the other was redesigned to correct the support deficiencies. Startup commenced again at 1215 hours on May 6, 1984.

NRC Form 366A
(9-83)

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Grand Gulf Nuclear Station - Unit 1	0 5 0 0 0 4 1 6	8 4	- 0 2 4	- 0 1	0 3	OF 0 3

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

A metallurgical evaluation was performed on the failed elbow and the weld-o-let. The crack on the inner bend radius of the elbow is attributed to high cycle, low stress fatigue. No pre-existing flaws were found at the fracture initiation site. The crack initiation in the weld-o-let occurred at a pre-existing weld defect, a shrinkage crack at the toe of the weld. The crack propagated by high cycle fatigue circumferentially along the weld-o-let in the base metal of the 18 inch pipe.

The same pipe spool on Unit 1 RHR loop A was examined and found acceptable. Similar weld-o-lets on Unit 2 were inspected and no indication of weld shrinkage was identified. The condition is considered isolated rather than generic.

The root cause of the abnormal vibrations on the system is attributed to the throttling of the F003 valve.



MISSISSIPPI POWER & LIGHT COMPANY

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P. O. BOX 1640, JACKSON, MISSISSIPPI 39205

August 8, 1984

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-13
File: 0260/L-835.0
Forced Shutdown Due to RHR Pipe
Support Deficiencies
LER 84-024/1
AECM-84/0408

Attached is Licensee Event Report (LER) 84-024/1 which is a final report.

Yours truly,

L. F. Dale
Director

EBS/SHH:rg
Attachment

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

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