



ENTERGY

Entergy Operations, Inc.

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

August 9, 1995

C. R. Hutchinson

Vice President
Operations
Grand Gulf Nuclear Station

U.S. Nuclear Regulatory Commission
Mail Station P1-37
Washington, D.C. 20555

Attention: Document Control Desk

Subject: Grand Gulf Nuclear Station
Docket No. 50-416
License No. NPF-29
Inadvertant Reactor SCRAM Due to Turbine Trip on Loss of
Condenser Vacuum (LER 95-008)

GNRO-95/00092

Gentlemen:

Attached is Licensee Event Report (LER) 95-008 which is a final report.

Yours truly,

CRH/JEO/
attachment:
cc:

Mr. J. E. Tedrow (w/a)
Mr. H. W. Keiser (w/a)
Mr. R. B. McGehee (w/a)
Mr. N. S. Reynolds (w/a)

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, Project Manager (w/2)
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Mail Stop 13H3
Washington, D.C. 20555

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NRC FORM 366 (5-92)		U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB NO. 3150-0104 EXPIRES 5/31/95		
LICENSEE EVENT REPORT (LER)					ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503		
FACILITY NAME (1) Grand Gulf Nuclear Station					DOCKET NUMBER (2) 05000-416		PAGE (3) 01 of 03
TITLE (4) Inadvertent Reactor SCRAM Due to Turbine Trip on Loss of Condenser Vacuum							
EVENT DATE (5)			LER NUMBER (6)		REPORT DATE (7)		OTHER FACILITIES INVOLVED (8)
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY
07	12	95	95	008	00	08	09
							FACILITY NAME
							N/A
							DOCKET NUMBER
							05000
							FACILITY NAME
							N/A
							DOCKET NUMBER
							05000
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more (11))					
1		20.402(b)		20.405(c)		X	
POWER LEVEL (10)		20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(iv)	
100		20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(v)	
		20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(vii)	
		20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(A)	
		20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(viii)(B)	
						OTHER	
LICENSEE CONTACT FOR THIS LER (12)							
NAME James Owens / Licensing Specialist					TELEPHONE NUMBER (Include Area Code) 501-437-6483		
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)							
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT
SUPPLEMENTAL REPORT EXPECTED (14)					EXPECTED		
YES (If yes, complete EXPECTED SUBMISSION DATE)					MONTH		
X NO					DAY		
					YEAR		
					SUBMISSION DATE (15)		
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16) <p>On July 12, 1995, a reactor SCRAM occurred due to a Main Turbine trip on low condenser vacuum. Failure of a condenser expansion joint resulted in rapid condenser vacuum decrease which led to a turbine trip and actuation of the Reactor Protection System (RPS). Continued decreasing Main Condenser vacuum following the reactor SCRAM led operators to close the Main Steamline Isolation Valves (MSIV). Reactor pressure and level was controlled using two Safety Relief Valves (SRV) and Reactor Core Isolation Cooling (RCIC). In the process of pressure control, a second SCRAM occurred on low level (Level 3, 11.4 inches) when the SRV was closed, however, at the time of the second SCRAM all control rods were fully inserted. This report is being submitted pursuant to 10CFR 50.73(a)(2)(iv).</p> <p>The cause of the event was failure of one of the rubber boots that form the Main Condenser expansion joints. The rubber expansion joint had been weakened by oil contamination.</p> <p>All control rods inserted fully and reactor level did not decrease below the automatic Emergency Core Cooling System (ECCS) actuation set point (Level 2, -41.6 inches). The RCIC system was manually initiated for vessel level and pressure control and two SRVs were manually cycled for pressure control. The health and safety of the general public were not compromised by this event.</p>							

NRC FORM 366A (5-92)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB NO. 3150-0104 EXPIRES 5/31/95		
<p align="center">LICENSEE EVENT REPORT (LER)</p> <p align="center">TEXT CONTINUATION</p>		<p>ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503</p>		
		FACILITY NAME (1) Grand Gulf Nuclear Station	DOCKET NUMBER (2) 05000-416	LER NUMBER (6) 95-008
TEXT (If more space is required, use additional copies of NRC Form 366A) (17)				
A. Reportable Occurrence				
<p>On July 12, 1995, at 0202, a reactor SCRAM occurred due to a Main Turbine trip on low Main Condenser [SG] vacuum. The Main Turbine trip was the result of a failed condenser expansion joint. During the sequence of events taken to stabilize the plant, a second SCRAM occurred on low reactor water level. At the time of the second SCRAM however, all control rods were already fully inserted, therefore, the safety function of the Control Rod Drive (CRD) system had been fulfilled. This report is being submitted pursuant to 10CFR50.73(a)(2)(iv).</p>				
B. Initial Conditions				
<p>At the time of the event the reactor was in OPERATIONAL CONDITION 1 with reactor power at 100 percent. Reactor temperature was approximately 532 F and reactor level at 36 inches.</p>				
C. Description of Occurrence				
<p>On July 12, 1995, at 0145, GGNS was in normal operation at 100 percent power when the "A" condenser boot seal level alarm was received. The "A" condenser boot seal level alarm was shortly followed by a decrease in condenser vacuum and an increase in offgas flow. In response to these conditions operators reduced reactor power to approximately 80 percent. The Shift Superintendent provided conservative direction to manually SCRAM the reactor at 23 inches indicated vacuum which is above the turbine trip setpoint. However a difference in location of the instrument taps for control room vacuum indication and vacuum input to the turbine trip system, resulted in a disparity in vacuum at these two points. Therefore, prior to reaching 23 inches control room indicated vacuum, a turbine trip on loss of condenser vacuum was received. An automatic reactor SCRAM occurred as a result of a turbine trip on loss of condenser vacuum.</p>				
<p>About one hour following the SCRAM, continued vacuum decrease necessitated closure of the MSIVs. Reactor pressure was controlled by alternate cycling of two Safety Relief Valves (SRVs B21-F041K and B21-F047H), and level was controlled by manually initiating Reactor Core Isolation Cooling (RCIC) [BN]. No Emergency Core Cooling System (ECCS) actuations occurred.</p>				
<p>Because of low heat load, the RCIC steam admission valve cycled several times due to high reactor water level, and the trip/throttle valve tripped closed on the last cycle. After tripping, the RCIC trip/throttle valve failed to operate properly, and required an operator to locally reset the trip.</p>				
<p>In the process of cycling SRVs to control reactor pressure a second reactor SCRAM was received on low level (Level 3, +11.4 inches). This SCRAM resulted from the level shrinkage that occurs when voids collapse as a result of closure of the SRVs. Therefore, given the course of events, this second SCRAM was not totally unexpected. Also, the safety function of the CRD system had been fulfilled as all control rods were already fully inserted. The plant was stabilized and corrective action initiated for the failed condenser expansion joint.</p>				

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<p>TEXT (If more space is required, use additional copies of NRC Form 366A) (17)</p>			
<p>D. Apparent Cause</p> <p>The cause of the event was failure of the High Pressure Condenser expansion joints between the Main Turbine and Condenser. Failure analysis of the expansion joint revealed the presence of lube oil which led to degradation of the rubber joint.</p> <p>E. Corrective Actions</p> <p>Immediate corrective action was to replace the failed Ethylene Propylene expansion joint with a Neoprene expansion joint. Neoprene is more resistant to oil than Ethylene Propylene. Also, the other two condenser expansion joints were inspected on both sides and no oil or indication of any other damage was found.</p> <p>Long term corrective actions include review and revision as necessary of the condenser expansion joint maintenance and inspection program and evaluation of the difference in indicated vacuum in the control room and vacuum sensed by the turbine trip system. Additionally, an evaluation will be conducted to determine whether physical modification of the condenser expansion joint area is feasible. Also a review of the turbine maintenance program will be conducted to determine whether areas of improvement exist in control of lube oil and response to oil spills.</p> <p>F. Safety Assessment</p> <p>This event did not hinder the ability of any systems to perform their safety functions. Minimum recorded reactor vessel water level was 0 inches wide range which is 167 inches above the top of active fuel. All ECCS was available to perform its safety function. Two safety relief valves were manually cycled to control reactor pressure and RCIC was manually initiated to maintain level and pressure. The health and safety of the general public were not compromised as a result of this event.</p> <p>G. Additional Information</p> <p>Energy Industry Identification System (EIIIS) codes are identified in the text within brackets [].</p>			