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February 25, 1994

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
Spurious ESF Actuation of Secondary Containment Isolation Valves During
Unit Outage
LER 93-012-01

GNRO-94/00025

Gentlemen:

Attached is Licensee Event Report (LER) 93-012-01 which is a final report.

Yours truly,

CRH/MJM/LFD/BAB

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)
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- Mr. Stewart D. Ebnetter (w/a)
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Handwritten initials/signature

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 (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					
FACILITY NAME (1) Grand Gulf Nuclear Station						DOCKET NUMBER (2) 05000-416		PAGE (3) 01 of 03			
TITLE (4) Spurious ESF Actuation of Secondary Containment Isolation Valves During Unit Outage											
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 NAME	DOCKET NUMBER	
10	14	93	93	012	01	02	25	94	N/A	05000	
									FACILITY NAME	DOCKET NUMBER	
									N/A	05000	
OPERATING MODE (9)		5		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more) (11)							
POWER LEVEL (10)		0		20.402(b)		20.405(c)		X		50.73(a)(2)(iv)	73.71(b)
				20.405(a)(1)(i)		50.36(c)(1)				50.73(a)(2)(v)	73.71(c)
				20.405(a)(1)(ii)		50.36(c)(2)				50.73(a)(2)(vii)	OTHER
				20.405(a)(1)(iii)		50.73(a)(2)(i)				50.73(a)(2)(viii)(A)	(Specify in abstract below and in text, NRC Form 366A)
				20.405(a)(1)(iv)		50.73(a)(2)(ii)				50.73(a)(2)(viii)(B)	
				20.405(a)(1)(v)		50.73(a)(2)(iii)				50.73(a)(2)(x)	
LICENSEE CONTACT FOR THIS LER (12)											
NAME Bruce A. Burke / Licensing Engineer					TELEPHONE NUMBER (Include Area Code) 601-437-6333						
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	
YES (If yes, complete EXPECTED SUBMISSION DATE)			X NO								
<p>Automatic actuation of an engineered safety feature (ESF) system occurred at Grand Gulf Nuclear Station (GGNS) on October 14, 1993. Secondary containment isolation valves closed automatically upon receipt of an apparent spurious isolation signal.</p> <p>Immediate investigation did not determine the cause. Subsequent investigation determined the most probable cause of the actuation was inadvertent operation of relay 1B21K17A. This determination was based on review of electrical and control system drawings for equipment that actuated. The wiring and connections in panels 1H13P623 and 1H13P871 will be inspected as plant conditions permit. Repairs will be made as necessary. Relay 1B21K17A had been replaced in November 1990 as a preventive measure based on service life. Operating history revealed no previous spurious operation of the relay.</p> <p>Safety related equipment operated as designed upon generation of the isolation signal. Safety and health 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		
LICENSEE EVENT REPORT (LER) TEXT CONTINUATION		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		
		FACILITY NAME (1) Grand Gulf Nuclear Station	DOCKET NUMBER (2) 05000-416	LER NUMBER (6) 93-012-01
TEXT (If more space is required, use additional copies of NRC Form 366A) (17)				
<p>A. REPORTABLE OCCURRENCE</p> <p>Automatic actuation of ESF components occurred at GGNS on October 14, 1993. ESF control systems [JE, JM] generated an isolation signal for some secondary containment [NG] isolation valves. This event is reportable per 10 CFR 50.73(a)(2)(iv).</p> <p>B. INITIAL CONDITIONS</p> <p>The plant was in Operational Condition 5 at zero percent power with the refueling cavity flooded for core alterations. Reactor water was approximately 114 degrees F. Division II RHR B was in service and provided the emergency core cooling system capability. Secondary containment was established. Numerous refueling outage activities were in progress. Core alterations had commenced earlier in the day but had been halted prior to this event.</p> <p>C. DESCRIPTION OF OCCURRENCE</p> <p>On October 14, 1993 at 1514 hours, a station I&C technician was in upper control room panel 1H13P871 compartment E performing surveillance 06-IC-1E61-R-1002. This surveillance calibrates the containment-to-drywell differential pressure loops for the post-accident monitoring system [IP]. The technician heard relays in compartment D changing state, but was unaware of what caused the event. Compartment D houses control system components for the secondary containment isolation system. Actuation of ESF systems occurred when the relays changed state, thereby generating an isolation signal for some secondary containment isolation valves.</p> <p>D. APPARENT CAUSE(S)</p> <p>Immediate investigation did not determine the cause of the spurious actuation. Wiring in both 1H13P871 compartments was visually inspected for loose connections and degradation, but no deficiency was observed. Initial review of control room logs and outage activities did not reveal a suspect cause. The actuation was initially suspected to have been caused by a voltage perturbation of the bus or activities associated with the unit outage.</p> <p>Subsequent investigation determined the most probable cause of the actuation was inadvertent operation of relay 1B21K17A. This determination was based on review of electrical and control system drawings for equipment that actuated. In addition, plant computer records indicated that trip units for the containment-to-drywell differential pressure loops did not cause the actuation.</p> <p>Relay 1B21K17A is located in panel 1H13P623 approximately fifteen feet from panel 1H13P871. Relay 1B21K17A is normally energized and its contacts M1 / T1 are normally</p>				

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<small>TEXT (if more space is required, use additional copies of NRC Form 366A) (17)</small>				
<p>closed when the outboard isolation logic is in standby (i.e., ready-for-service). The contacts could have opened while performing other surveillance or maintenance activities in panel 1H13P623. Potential causes of the relay changing state inadvertently include physical bumping the relay, loose wiring connections to the relay, opening the power supply circuit breaker at the distribution panel, and short circuiting of the relay due to personnel error. Plant records indicated that outage activities could have been in progress in panel 1H13P623 about the time of this actuation.</p>				
<p>This Agastat brand relay had been replaced in November 1990 as a preventive measure based on service life. Operating history revealed no previous spurious operation of the relay.</p>				
<p>Radio frequency interference (RFI) was investigated as a possible cause. RFI typically affects instrumentation (transmitters, trip units, etc.), not relays. However, plant computer records indicated that trip units for the equipment being surveilled did not cause the actuation.</p>				
<p>E. CORRECTIVE ACTION(S)</p>				
<p>Wiring and connections were visually inspected in panel 1H13P871 with no deficiency found. Work order 109275 was initiated to inspect the wiring and connections in panels 1H13P623 and 1H13P871. The inspection will be performed as plant conditions permit. Repairs will be made as necessary.</p>				
<p>F. SAFETY ASSESSMENT</p>				
<p>The consequences of this event were minimal. The secondary containment isolation valves responded as designed. Systems were restored to their standby condition.</p>				
<p>Safety related equipment operated as designed. Safety and health of the general public were not compromised by this event.</p>				
<p>G. ADDITIONAL INFORMATION</p>				
<p>Energy Industry Identification System (EIIS) codes are identified in the text within brackets [].</p>				