



ENTERGY

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Vice President
Operations
Grand Gulf Nuclear Station

June 11, 1992

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
Deficiencies in Thermal Overload Relay Settings of 480V ESF
Motors
LER 92-007-00

GNRO-92/00072

Gentlemen:

Attached is Licensee Event Report (LER) 92-007 which is a final report.

Yours truly,

W. T. Cottle

WTC/RR/cg
attachment

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NRC Form 366 (9-83)										U.S. NUCLEAR REGULATORY COMMISSION APPROVED OMB NO. 3150-018 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 1 6					PAGE (3): 1 OF 0 4										
TITLE (4): Deficiencies in Thermal Overload Relay Settings of 480V ESF Motors																									
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	1	9	2	9	2	0	0	7	0	0	0	6	1	1	9	2	0	5	0	0	0	1	1
THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)																									
OPERATING MODE (8):		20.402(b)		20.405(i)		50.73(a)(2)(iv)		73.11(b)																	
POWER LEVEL (10):		20.405(a)(1)(ii)		50.36(i)(1)		50.73(a)(2)(v)		73.11(c)																	
01010		20.405(a)(1)(iv)		50.36(i)(2)		50.73(a)(2)(vi)		OTHER (Specify in Abstract below and in Text, NRC Form 365A)																	
		20.405(a)(1)(vi)		50.73(a)(2)(iii)		50.73(a)(2)(viii)(A)																			
		20.405(a)(1)(vii)		X 50.73(a)(2)(iv)		50.73(a)(2)(viii)(B)																			
		20.405(a)(1)(viii)		50.73(a)(2)(v)		50.73(a)(2)(ix)																			
LICENSEE CONTACT FOR THIS LER (12):																									
NAME: Riley Ruffin / Licensing Specialist										TELEPHONE NUMBER: 6 0 1 4 3 7 4 2 1 6 7															
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13):																									
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPROS																
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):																									
<p>On May 11, 1992 during a review of design calculations associated with the Thermal Overload (TOL) Relays for 480V continuous duty motors, it was determined that the TOL settings for certain motors may not be conservative for extended operation at undervoltage conditions.</p> <p>The calculations used to identify deficient TOL and overload heater settings are part of the GGNS upgrade program. The method that was used in the calculation accounted for motor currents at degraded voltage. The previous method used did not explicitly consider the effects of voltage variations on motor current. Therefore, it did not take into account the increased current flow necessary for equipment operation during degraded voltage conditions.</p> <p>The TOL settings were optimized during Refueling Outage Five. This action utilized the methodology reviewed during the EDSFI and is consistent with the UFSAR.</p>																									
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TEXT (If more space is required, use additional NRC Form 306A's) (17)

A. Reportable Occurrence

During a review of engineering calculations for thermal overload relay (TOL) settings, it was determined that the TOL settings for certain continuous duty 480V Class 1E motors may not be conservative for extended operation at undervoltage conditions. This report is being submitted pursuant to 10 CFR 50.73 (a)(2)(ii).

B. Initial Conditions

The plant was in Mode 5, Refueling, with reactor coolant temperature at approximately 90 degrees F.

C. Description of Occurrence

On May 11, 1992 during a review of design calculations associated with the Thermal Overload (TOL) Relays for 480V Motor Control Center continuous duty motors, it was determined that the TOL settings for certain motors may not be conservative for extended operation at undervoltage conditions.

The GGNS UFSAR requires that Class 1E electrical equipment be protected from destruction, however, the safety function performance is the primary concern. The protective devices (TOLs) in the circuits associated with the Class 1E equipment should actuate only to prevent catastrophic failure of equipment which may exacerbate accident conditions. Contrary to the intent of the UFSAR, the TOLs and overload heaters could have actuated (tripped) during degraded voltage conditions which were within the capability of the equipment to operate.

A nonconformance report was initiated to document the condition. The design for equipment operability during undervoltage conditions assumes operation at 90 percent undervoltage. This level is based on the voltage setpoint for operability of the ESF bus. The condition represents the worst case degraded voltage value for design. The performance of the offsite system and the standby diesel generator unit could support a higher value.

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

The disposition of the nonconformance report required that the TOL settings be increased to prevent premature trips of operating components. In the interim for equipment required to be operable action was taken to place TOL settings at the maximum set position. TOL relays which could not be adjusted were replaced with larger components. The voltage of the 4160V ESF buses was monitored to ensure that the bus voltage remained adequate.

Additionally, a Standing Order was issued to require station personnel to contact the system dispatcher in order to increase the incoming line voltage such that the ESF buses would be maintained above nominal values. Bus voltage could be regulated by the use of the associated diesel generator if required.

D. Apparent Cause

The calculations used to identify deficient TOL and overload heater settings are part of the GGNS upgrade program. The methodology used in the calculation to account for motor currents at degraded voltage is conservative with respect to the applied voltages and represents the worst case expected performance for the loads. This method was reviewed and accepted during the EDSFI.

The previous method used did not explicitly consider the effects of voltage variations on motor current. Therefore, it did not take into account the increased current flow necessary for equipment operation during degraded voltage conditions.

E. Corrective Actions

The TOL settings were optimized during Refueling Outage Five. This action utilized the methodology reviewed during the EDSFI and is consistent with the UFSAR.

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

F. Safety Assessment

The analysis considered a severely degraded system voltage and worst case performance of protective devices. The voltage levels postulated would not be expected to occur over extended periods of time. The standby diesel generators could have been used to maintain bus voltages at acceptable levels to prevent tripping of protective devices. Actuation of protective devices would be limited and operator response to loss of equipment would prevent adverse consequences. The affected components would be expected to perform intended functions under nominal conditions. Therefore, the health and safety of the public were not compromised.

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