



**System  
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February 28, 1990

U.S. Nuclear Regulatory Commission  
Mail Station P1-137  
Washington, D.C. 20555

Attention: Document Control Desk

Gentlemen:

SUBJECT: Grand Gulf Nuclear Station  
Unit 1  
Docket No. 50-416  
License No. NPF-29  
Update on Nonconformances  
Revealed During  
Instrumentation Design  
Basis Review  
LER 89-018-01  
AECM-90/0043

Attached is Licensee Event Report (LER) 89-018-01 which is a final report.

Yours truly,

WTC:cg  
Attachment

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## 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 0 5									
TITLE (4) Update on Nonconformances Revealed During Instrumentation Design Basis Review																							
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										
1	2	1	5	8	9	8	9	0	1	8	0	1	0	3	2	2	9	0	0	5	0	0	0
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §. (Check one or more of the following) (11)																					
1		20.402(b)				20.405(e)				50.73(a)(2)(iv)				73.71(b)									
POWER LEVEL (10)		20.406(a)(1)(i)				50.36(e)(1)				50.73(a)(2)(v)				73.71(c)									
1		20.406(a)(1)(ii)				50.36(e)(2)				50.73(a)(2)(vi)				OTHER (Specify in Abstract below and in Text, NRC Form 366A)									
		20.406(a)(1)(iii)				50.73(a)(2)(i)				50.73(a)(2)(viii)(A)													
		20.406(a)(1)(iv)				X 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 Byrd / Licensing Engineer										TELEPHONE NUMBER 6 10 1 4 3 7 - 1 2 1 8 2													
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																							
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC													
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 design basis review of instrumentation revealed several cases of apparently inappropriate quality level designations in which devices classified as non-safety related were identified in Class 1E circuits. This condition did not appear to meet the requirements of Regulatory Guide 1.75 for suitable isolation from Class 1E power sources. The circuits containing the subject devices were in compliance with RG 1.75 Class 1E criteria.

A team of engineers reviewed the specifics of each of the identified non-safety related applications in Class 1E circuits and determined that in each case reasonable assurance existed that the conditions would not degrade the interfacing safety related circuits or functions. Therefore, continued service in their respective circuits was acceptable pending completion of final evaluations.

Final evaluations confirmed that all devices were acceptable for continued service in their applications. Only two devices that are not fully Class 1E qualified have an active safety function requiring a safety-related quality level designation. Although deemed acceptable for continued service, it was deemed prudent to replace the two devices with those of suitable qualification during RF04. Four other handswitches will be inspected during RF04 to determine if they are Class 1E qualified as required.

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APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/88

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TEXT (If more space is required, use additional NRC Form 309A's) (17)

## A. Reportable Condition

As a result of a design basis review of instrumentation being conducted by the System Energy Design Engineering organization, several cases of apparently inappropriate quality level designations were identified. Specifically, a population of devices classified as non-safety related were identified in Class 1E circuits. This condition did not appear to meet the isolation requirements of Regulatory Guide 1.75 and was therefore reported pursuant to 10CFR50.73(a)(2)(ii)(B) as a condition outside the design basis for the plant. This update report is submitted to provide the results of the completed evaluation.

## B. Initial Conditions

The condition was identified on December 15, 1989 while the unit was operating at 100 percent power.

## C. Description of Occurrence

System Energy has been performing reviews of the design basis for instrumentation at Grand Gulf Nuclear Station as a part of the Instrumentation and Setpoint Control Program. One element of this program consisted of reviewing the original quality level assignments of instrumentation for the facility, determining the appropriate quality level assignment based on instrument function, and resolving any apparent differences. The population of instruments considered in the review was in excess of 23,000.

On December 15, 1989 System Energy Design Engineering identified a subset of this population which was procured and/or specified to be non-safety related by the original design group, yet were located in Class 1E circuits. The items appeared to have been installed contrary to the requirements of Regulatory Guide 1.75, in that suitable isolation from Class 1E power sources had not been provided. Suitable analysis could not be found to justify the current circuit configurations by considering the non-safety related loads as "associated circuits" per Regulatory Guide 1.75 Section C.4. The total review identified 81 items of apparent nonconformance which required further evaluation to determine acceptability in their application.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104

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## D. Apparent Cause

The acceptability of the device applications was brought into question during a comprehensive reevaluation of the basis for instrument quality classifications. One factor in System Energy's decision to undertake this comprehensive reevaluation was concern over the level of control of the Instrument Index used by the Architect Engineer, Bechtel, for tabulation of instrument data during original design. Because the Instrument Index was not considered a fully controlled document, the validity and bases of quality classifications could not be readily ascertained. Thus, the assignment of non-safety related devices in applications that interfaced with Class 1E circuits was questionable.

As discussed in Section E and F below, no conditions adverse to plant safety were identified and most non-safety related quality designations were determined to be acceptable. Some devices were determined to require upgrading to a safety-related quality designation based on their service function. The cause of the apparent quality level classification discrepancies was a combination of the level of Instrument Index controls that existed during original plant design and the lack of written documentation of evaluations required by Regulatory Guide 1.75.

## E. Corrective Actions

The essence of the Instrumentation and Setpoint Control Program provides adequate assurance that the entire population of potential discrepancies of a similar nature have been identified. The program guidelines were of sufficient scope to identify discrepancies between installed instrumentation and design requirements. Current program controls are adequate to ensure that appropriate design requirements are maintained for instrument applications.

A dedicated team of engineers was assigned to review the specifics of each of the identified non-safety related applications in Class 1E circuits. It was determined that in each case reasonable assurance existed that the condition would not degrade the interfacing safety related circuits or functions. Therefore, continued service in their respective circuits was acceptable pending completion of the final evaluations.

The System Energy Design Engineering Group completed the evaluation of component application with the following results:

- o Fourteen of the devices were determined to be suitable for Class 1E application and were upgraded to a safety-related quality level classification.

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- o Sixty-one of the devices did not meet all criteria to be classified as Class 1E but were dispositioned as acceptable based on compliance with the criteria for associated circuits set forth in Regulatory Guide 1.75.
- o The qualification of four installed handswitches which are required to meet Class 1E criteria is indeterminate at this time due to the inability to perform inspections during plant operation. The handswitches operate two feedwater system (EIIIS Code: SJ) inlet shutoff valves, B21-F065A and B21-F065B. Two of the handswitches initiate valve opening and closing while the other two are used to stop valve movement during the opening or closing cycle. These handswitches are suspect because of a discrepancy between two General Electric documents. An Elementary Diagram Device List (EDDL) correctly specified Class 1E Cutler Hammer switches for this application while an Electrical Device List (EDL) incorrectly specified non-class 1E Cutler Hammer switches. Since the non-Class 1E Cutler Hammer switches are physically identical to the Class 1E switches, the original equipment supplier (GE) performed an evaluation based on operating history to allow continued service. The four switches will be inspected during the fourth refueling outage (RFO4) and replaced if found to be the non-Class 1E type.
- o Two devices that are not fully Class 1E qualified have an active safety function requiring a safety-related quality level designation. The two devices are handswitches that operate the component cooling water (CCW) system (EIIIS Code: KG) 'B' pump. The handswitch contacts must not inadvertently change state during or after a safe shutdown earthquake to ensure that the 'B' CCW pump sheds from its power source upon actuation of the load shedding and sequencing system following a Loss of Coolant Accident (LOCA) event. Because the handswitches provide an active safety function, the quality designation has been upgraded to a safety-related classification. Although the installed handswitches were found to be acceptable for continued service, it was determined prudent to replace the two non-Class 1E handswitches with suitably qualified Class 1E handswitches during RFO4.

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## F. Safety Assessment

An engineering assessment was performed for each device identified as non-safety related in a Class 1E circuit to determine interim acceptability pending completion of final evaluations. The assessment included a review of maintenance history to determine if failures related to circuit integrity had been experienced; a detailed circuit review to assess the impact of postulated credible component failure on the Class 1E circuit should failure occur; and a review of potential failure mechanisms for the component found in the circuit. Based on the assessment, it was concluded that there is reasonable assurance that the conditions identified would not degrade safety circuits and functions. The Plant Safety Review Committee reviewed and concurred with the assessment.

The non-Class 1E Cutler Hammer switches are physically identical to the Class 1E qualified switches. The four switches are mounted in a Control Room panel which is a mild environment. Because of physical similarities between the Class 1E and non-Class 1E switches, the switches are expected to perform similarly during a seismic event. The two non-Class 1E handswitches for the 'B' CCW pump are also located in a Control Room panel (mild environment), are physically similar to Class 1E qualified switches, and are expected to perform similarly during a seismic event. Therefore, the existing devices are acceptable for continued service in their respective circuits with no significant adverse impact to plant safety.