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CALVERT CLIFFS NUCLEAR POWER PLANT DEPARTMENT
CALVERT CLIFFS NUCLEAR POWER PLANT
LOBBY, MARYLAND 20657

March 29, 1990

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555

Docket No. 50-317
License No. DPR 53

Dear Sirs:

The attached LER 90-08, Revision 0, is being sent to you as required under 10 CFR 50.73 guidelines.

Should you have any questions regarding this report, we would be pleased to discuss them with you.

Very truly yours,

R. E. Denton
Manager

DWM/lr

cc: William T. Russell
Director, Office of Management Information
and Program Control
Messrs: G. C. Creel
C. H. Cruse
J. R. Lemons
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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Calvert Cliffs, Unit 1										DOCKET NUMBER (2) 0 5 0 0 0 3 1 7 1 OF 0 6										PAGE (3) 1 OF 0 6																													
TITLE (4) Inadequate Hydrogen Analyzer Calibration Due to Deletion of Loop Check from Procedure																																																	
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 2			2 7			9 0			9 0			0 0 8			0 0			0 3			2 9			9 0			Calvert Cliffs, Unit 2										0 5 0 0 0 3 1 8												
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OPERATING MODE (9) 5										THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)																																							
POWER LEVEL (10) 0 0 0										20.402(b)										20.405(e)										50.73(a)(2)(iv)										73.71(b)									
										20.405(a)(1)(i)										50.36(e)(1)										50.73(a)(2)(v)										73.71(e)									
										20.405(a)(1)(ii)										50.36(e)(2)										50.73(a)(2)(vi)										OTHER (Specify in Abstract below and in Text, NRC Form 366A)									
										20.405(a)(1)(iii)										X 50.73(a)(2)(i)										50.73(a)(2)(viii)(A)																			
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LICENSEE CONTACT FOR THIS LER (12)																																																	
NAME D. W. Muth, Compliance Engineer																				TELEPHONE NUMBER 3 0 1 2 6 0 - 3 5 9 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)																																																	
YES (If yes, complete EXPECTED SUBMISSION DATE)																				X NO										EXPECTED SUBMISSION DATE (15)																			
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

On February 27, 1990, with Unit 1 in Mode 5 and Unit 2 defueled, the procedural controls governing the calibration of the hydrogen analyzers were determined to have created a condition prohibited by the plant's Technical Specifications and therefore reportable under 10 CFR 50.73(a)(2)(i)(B). The System Engineer found that Surveillance Test Procedure M-280-0 "Hydrogen Analyzer Calibration Check", did not include steps to fully test the control room recorder for the hydrogen analyzers or the complete circuitry leading from the hydrogen analyzers to the recorder.

The cause of this condition was personnel error with inadequate procedural controls as a contributing cause.

STP M-381-0 was written on March 8, 1990 to include the complete loop calibration check. STP M-280-0 was revised on March 8, 1990 to make it compatible with STP M-381-0. Performance of both STPs was completed by March 20, 1990.

The revised CCI-101, "Calvert Cliffs Implementing Procedure Development and Control," requires that the Technical Specifications being met by a procedure must be clearly identified near the beginning of the procedure.

We have instituted a Performance Improvement Plan item requiring the review of STPs for technical adequacy relative to the Technical Specifications.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 60.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Calvert Cliffs, Unit 1	DOCKET NUMBER (2) 05000317	LER NUMBER (6)			PAGE (3)	
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		90	008	000	2	OF 6

TEXT (If more space is required, use additional NRC Form 300A's) (17)

I. DISCUSSION

On February 27, 1990, with Unit 1 in Mode 5 and Unit 2 defueled, the procedural controls governing the calibration of the hydrogen analyzers (EIIS BB-AE) were determined to have created a condition prohibited by the plant's Technical Specifications and therefore reportable under 10 CFR 50.73(a)(2)(i)(B). The System Engineer found that Surveillance Test Procedure (STP) M-280-0 "Hydrogen Analyzer Calibration Check", did not include steps to fully test the control room recorder (EIIS BB-AR) for the hydrogen analyzers or the complete circuitry leading from the hydrogen analyzers to the recorder.

Technical Specification 4.6.5.2 requires that a channel calibration be performed every 92 days to verify that the hydrogen analyzer is operable. A channel calibration should encompass the whole circuit including recorders. Local indication (EIIS BB-AI) in the area of the analyzers was calibrated but not the control room recorder.

Since both units are shut down, the action requirements of Technical Specification 3.6.5.1, which require that the plant be in Hot Shutdown within 6 hours of discovery, were not applicable.

The channel calibration of the complete loop was satisfied by STP M-380-0, "Hydrogen Analyzer Calibration Check". In mid-1987, the hydrogen analyzer calibration was moved to STP M-280-0 and the calibration of individual components in the loop, including the control room recorder, was moved to Preventative Maintenance (PM) Card Number 2-38-1-RQ2-202. The PM was scheduled to be performed on a refueling interval basis. As stated above, the calibration of the complete loop should be performed every 92 days. This condition existed approximately two and a half years. There are no other structures, systems or components that contributed to this event.

II. CAUSE OF CONDITION

The cause of this condition was personnel error with inadequate procedural controls as a contributing cause. The loop check should not have been removed from the calibration procedure. Although the components in the loop are individually tested in the PM, the entire loop was not calibrated at one time and the frequency of the PM did not match the Technical Specification surveillance requirement regarding frequency of performance. The personnel who revised the procedure did not have available to them adequate design basis documentation for the hydrogen analyzer. This contributed to the lack of knowledge that caused the personnel error.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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TEXT (If more space is required, use additional NRC Form 306A's) (17)

The procedural controls in place at the time were inadequate to ensure that the full intent of the Technical Specification was met when the STP was revised. The historical root cause of inadequate procedures has been previously identified in the Performance Improvement Plan, which specifically cites inadequate control for capturing the bases for procedure changes as they are made and over-reliance on worker knowledge and experience.

III. ANALYSIS

There are two hydrogen analyzer systems, each of which receives input from both units. The hydrogen analyzers were installed in response to NUREG-0737 item II.F.1.(6), "Accident-Monitor, Containment Hydrogen." The purpose of the analyzers is to provide Control Room operators with indication of the level of hydrogen in containment after a Loss of Coolant Incident (LOCI). This information is used by the operator to determine whether or not to turn on the hydrogen recombiners (EIIS BB-RCB), which remove hydrogen from the containment atmosphere. The hydrogen analyzers also serve to inform the operator if the recombiners are not functioning.

Figure 1 is a block diagram of the hydrogen analyzer system. Device 1 is the hydrogen analyzing cell (AE-6519) and its associated electronics (AY-6519). Device 2 is the isolator (EIIS BB-AB) (E/I-6519A) feeding the output signal to Device 3, the control room recorder (AR-6519). Devices 4 and 5 are the local indicators in the 45 foot and -10 foot levels of the Auxiliary Building, respectively.

STP M-280-0 required that Devices 4 and 5, the local indicators, be in calibration with one another. The STP did not require measurement of the output voltage leading from the analyzing cell to the control room recorder. It was possible for this voltage to drift, causing inaccurate readings in the control room. This condition would not have been detected using STP-280-0 or the PM.

The input from the hydrogen analyzers is only relied on during certain LOCI scenarios. The control room recorder indicates the level of hydrogen on a scale from 0 to 10 percent. The administrative limit for turning on the recombiners is 1 percent hydrogen. The level assumed in the Final Safety Analysis Report is 3 percent hydrogen.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

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TEXT (If more space is required, use additional NRC Form 306A's) (17)

Both analyzer systems were recently calibrated using the revised STP M-280-0 and the newly written STP M-381-0, which together perform the loop check correctly (see Corrective Action 1 below). One system was found to be within tolerance, the other was not functioning due to an open slide link in its isolator. This open link would not have been found using the earlier, deficient revision of M-280-0 or the PM. After a LOCI, the recorder associated with the non-functioning analyzer would have read zero hydrogen concentration regardless of what the concentration actually was. The effects of this are mitigated by the availability of the other analyzer and the capability to obtain and analyze grab samples of containment atmosphere. However, there were no procedural controls in place requiring that both analyzers be on-line and providing indication in the Control Room. Had the non-functioning analyzer been the only one lined up, the Control Room operators would not have had accurate hydrogen indication. The analyzer system was found to be in calibration when the open link was closed and STPs M-280-0 and M-381-0 were performed.

IV. CORRECTIVE ACTIONS

1. STP M-381-0 was written on March 8, 1990 to include the complete loop calibration check. STP M-280-0 was revised on March 8, 1990 to make it compatible with STP M-381-0. Performance of both STPs was completed by March 20, 1990, as discussed above.
2. Calvert Cliffs Instruction 104, "Surveillance Test Program", now assigns Functional Surveillance Test Coordinators (FSTCs) responsibility for overseeing and maintaining their assigned STPs. Each FSTC is required to ensure that all Technical Specifications associated with a given STP are fully implemented in the STP. All new or revised STPs receive a review using strict guidelines designed to ensure compliance with technical specifications. New or revised procedures will also receive a review by the System/Component Engineer or appropriate technical expert as well as the department responsible for performing the procedure.
3. The revised CCI-101, "Calvert Cliffs Implementing Procedure Development and Control," requires that the Technical Specifications being met by a procedure must be clearly identified near the beginning of the procedure.
4. We have instituted a Performance Improvement Plan item requiring the review of STPs for technical adequacy relative to the Technical Specifications. The goal of this review is to assure that STPs are consistent with Technical Specification requirements. This review will also identify the design basis of the equipment associated with each STP. The circumstances relative to this event will be factored into the priority and the schedule of this review.

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

5. Emergency Response Plan Implementing Procedure 4.1.8.3 "Containment Atmosphere Task Instruction/Precaution," will be revised to require that both hydrogen analyzers be lined up in the event of a LOCI.

V. ADDITIONAL INFORMATION

Similar problems with procedural implementation of Technical Specifications were documented in LERs 318/88-006, 317/88-001, 317/89-010, 317/89-013, 317/89-017, 318/89-022, 317/89-024, 317/90-001 and 317/90-007.

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TEXT (If more space is required, use additional NRC Form 380A's) (17)

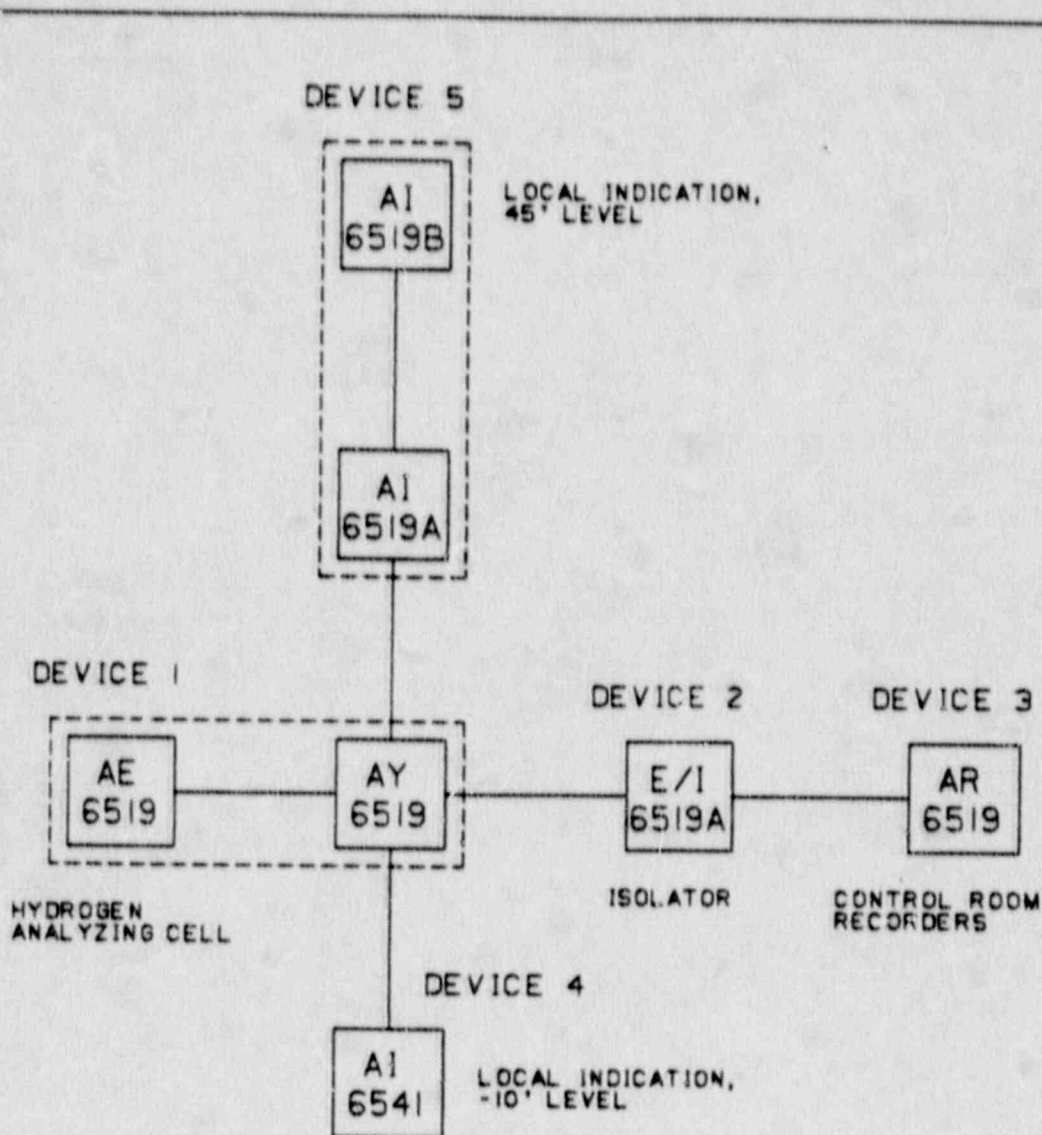


FIGURE 1
BLOCK DIAGRAM OF HYDROGEN ANALYZER SYSTEMS