PETER E. KATZ
Plant General Manager
Calvert Cliffs Nuclear Power Plant

Baltimore Gas and Electric Company
Calvert Cliffs Nuclear Power Plant
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410 495-4101

BGE

February 10, 1997

U.S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 and 2; Docket Nos. 50-317 and 50-318;
License Nos. DPR 53 and DPR 69
Licensee Event Report 97-001
Spent Fuel Moved with Ventilation System Inoperable and Missed Surveillances

The attached report is being sent to you as required under 10 CFR 50.73 guidelines. Should you have questions regarding this report, we will be pleased to discuss them with you.

Very truly yours,

for
P. E. Katz
Plant General Manager

PEK/DWM/bjd

Attachment

cc: D. A. Brune, Esquire
J. E. Silberg, Esquire
Director, Project Directorate I-1, NRC
A. W. Dromerick, NRC
H. J. Miller, NRC
Resident Inspector, NRC
R. I. McLean, DNR
J. H. Walter, PSC

NRC FORM 366 (4-95) U. S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES: 04/30/98
ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENISNG PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), 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.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Calvert Cliffs, Unit 1	05000 317	1 OF 06

TITLE (4)

Spent Fuel Moved with Ventilation System Inoperable and Missed Surveillance

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
									Calvert Cliffs, U2	05000 318
01	10	97	97	001	00	02	10	97	FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (Check one or more) (11)					
POWER LEVEL (10)	100	20.2201(b)	20.2203(a)(2)(v)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)
		20.2203(a)(1)	20.2203(a)(3)(i)	X	50.73(a)(2)(ii)		50.73(a)(2)(x)
		20.2203(a)(2)(i)	20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
		20.2203(a)(2)(ii)	20.2203(a)(4)		50.73(a)(2)(iv)		OTHER
		20.2203(a)(2)(iii)	50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below
		20.2203(a)(2)(iv)	50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (include Area Code)
D. W. Muth, Engineer	410-495-3592

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
X	YES (If yes, complete EXPECTED SUBMISSION DATE)	NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately15 single-space typewritten lines) (16)

On Friday, January 10, 1997, it was discovered that air from the Spent Fuel Pool (SFP) area was leaking out into the Auxiliary Building while fuel was being moved in the SFP. This condition was outside the design basis of the plant. Subsequent investigation found that the Surveillance Test Procedure performed every 18 months to demonstrate operability of the SFP ventilation system had not been performed since September of 1994.

Fuel movement has been suspended until appropriate procedures are changed to ensure that the SFP ventilation system operates at a negative pressure versus surrounding areas, including the Auxiliary Building.

A Root Cause Analysis is being performed to determine casual factors and generic implications for this event.

Additional actions will be reported in a supplement to this report.

I. DESCRIPTION OF EVENT

On Friday, January 10, 1997, it was discovered that air from the Spent Fuel Pool (SFP) area was leaking out into the Auxiliary Building while fuel was being moved in the SFP. Since the Updated Final Safety Analysis Report (UFSAR) assumes that all air in the area will pass through the SFP ventilation system in the event of a fuel handling accident, this condition was outside the design basis of the plant. Subsequent investigation found that the Surveillance Test Procedure (STP) performed every 18 months to demonstrate operability of the SFP ventilation system had not been performed since September of 1994. Both Units were in MODE 1 at 100 percent power and normal operating temperature and pressure at the time of discovery.

Calvert Cliffs Units 1 and 2 share a common SFP area Ventilation of the SFP area is accomplished by an exhaust system which draws SFP air through high efficiency particulate air (HEPA) filters and discharges into the main plant vent of Unit 1. When fuel is being moved, the air is diverted through charcoal filters prior to being discharged to the main plant vent. The system normally maintains a negative pressure with respect to ambient and surrounding areas of the building. The Auxiliary Building ventilation system draws tempered outside air through two air supply fans and releases it into the main plant vent largely via two exhaust fans. The flow path includes a HEPA filter and radiation monitoring equipment but no charcoal filters.

On Monday, January 6, 1997 at approximately 0630 hours, Auxiliary Building Supply Fans 11 and 12 were tagged out to allow work on their discharge dampers. This placed Unit 1 in an abnormal line up in that only one Auxiliary Building supply fan was now in operation. Historically, this has not been considered an issue because the Auxiliary Building is still being maintained at a negative pressure with respect to the atmosphere. An unknown effect of this line up, however, was that the Auxiliary Building became more negative than the SFP area which caused some leakage from the SFP area into the Auxiliary Building. The removal of the discharge dampers from the supply fans also contributed to reversal of the differential pressure between the Auxiliary Building and the SFP area.

Fuel movement began in the SFP area on Wednesday, January 8, 1997 at 0705 hours. Fuel was being moved in preparation for the upcoming Unit 2 refueling outage and was scheduled to last the week. On Friday, January 10, 1997 at approximately 1030 hours, a Nuclear Regulatory Commission resident inspector noticed that a door from the SFP area was open, apparently due to the air flow from the SFP area into the Auxiliary Building. This was reported to Control Room personnel, who immediately had the door closed and the closure mechanism adjusted. Following some discussion, fuel movement was secured due

to the air still escaping under the door. At 1715 that evening, it was determined that this condition was outside the design basis of the plant. It was therefore reported to the Nuclear Regulatory Commission via the Emergency Notification System.

On Wednesday, January 15, 1997, the System Manager tested various vent paths in the Auxiliary Building and found that during non-outage conditions, the SFP area would maintain a negative pressure versus the Auxiliary Building in any configuration with two air supply fans operating, and could do so, depending on the configuration, with one supply fan operating. Appropriate procedures will be revised and personnel trained prior to fuel movement to ensure that two supply fans are operating or that the SFP area is maintained at a negative pressure whenever fuel is being handled.

On Wednesday, January 22, 1997 at about 1105 hours, Surveillance Test Coordination personnel were reviewing the records for STP-542, which, at 18 month intervals, verifies the ability of the SFP ventilation system to maintain negative pressure relative to the outside atmosphere and the Auxiliary Building, in accordance with Technical Specification Surveillance Requirement 4.9.12.d.2. They found that the full STP had not been run since September of 1994 and was due in March 1996. The test had been partially run on July 18, 1995 following replacement of the HEPA banks. The partial test verified exhaust fan operability, HEPA bank operability and air distribution. It did not verify negative pressure versus the outside or the Auxiliary Building. The Functional Surveillance Test Coordinator reviewed the test and, failing to recognize that the section verifying negative pressure had not been run, erroneously concluded that the test was complete. He reset the 18 month clock following the partial test. Failure to perform the STP within the required time limit constituted a condition prohibited by Technical Specifications. Both Units were in MODE 1 at 100 percent power and normal operating temperature and pressure at the time of discovery.

II. CAUSE OF EVENT

This event resulted from insufficient consideration of and inadequate barriers erected to ensure that the assumptions of the UFSAR fuel handling accident safety analysis were met. Section 14.18.3.2.d of the UFSAR, "Fuel Handling Incident in the Spent Fuel Pool Area," states that, "All of the activity released to the air above the spent fuel pool is assumed to be discharged to the outside atmosphere through charcoal filters." Air leaking from the SFP area to the Auxiliary Building in the event of a fuel handling accident would not pass through charcoal filters. Technical Specification Surveillance Requirement 4.9.12.d.2 requires verification that "each exhaust fan maintains the spent fuel pool area at a measurable negative pressure relative to the

outside atmosphere during system operation." Surveillance Test Procedure STP-M-542 tests for negative pressure versus outside air and surrounding areas, including the Auxiliary Building. However, this procedure does not account for possible bypass flow as a result of ventilation lineup changes in surrounding areas, including the Auxiliary Building. Fuel handling procedures require verification that the SFP area exhaust fans work but give no consideration to pressure differences between the SFP area and surrounding areas, including the Auxiliary Building. Operations, Engineering, Maintenance, and Nuclear Fuel Management personnel were accustomed to thinking in these terms and did not give consideration to pressure differences between the SFP area and the Auxiliary Building.

A Root Cause Analysis is under way to review this item and its generic implications. The findings of this review will be included in a supplement to this report.

The missed surveillance was the result of personnel error on the part of the responsible Functional Surveillance Test Coordinator. He had erroneously counted partial performance of the STP on July 18, 1995 as complete performance and so had changed the schedule of the test from December 1995 to January 1997.

III. ANALYSIS OF EVENT

As noted above, the UFSAR analysis for a fuel handling accident assumes that all releases will pass through a charcoal filter. Section 14.18.3.2.d of the UFSAR also states that, "The charcoal filters have an absorption efficiency of 90 percent for inorganic iodine and 70 percent for organic iodine." The analysis calculates a thyroid dose at the site boundary of 3.39 Rem. With the door ajar as found, the System Engineer estimated one percent air leakage from the SFP area. This would raise the dose at the site boundary to approximately 3.58 Rem thyroid and 0.16 Rem whole body. While slightly higher than calculated in the UFSAR, this is still considerably lower than 10 CFR Part 100 limits and well below the UFSAR calculated site boundary thyroid dose of 14.06 Rem from a fuel handling accident in containment. The UFSAR analysis also assumes that the damaged fuel assembly has the highest activity in the core. The fuel actually being moved at the time of discovery of this condition was considerably less active than assumed in the UFSAR analysis.

Even if all the iodine released during a fuel handling accident bypassed the charcoal filters, the site boundary dose would be no greater than 22.25 Rem thyroid and 0.72 Rem whole body, which is considerably less than 10 CFR Part 100 limits.

This item was reportable under 10 CFR 50.73(a)(2)(ii)(B) as a condition outside the plant's design basis and under 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by the plants Technical Specifications.

There were no safety consequences resulting from the missed STP. The partial test verified the operability of the fans and HEPA filters. The complete test was successfully performed on January 24, 1997. Apart from this event, there is no evidence that the SFP ventilation system was incapable of performing its safety function without being declared inoperable between the time the STP expired and was performed again. Fuel movement is required by procedure to stop if the SFP exhaust fans are incapable of performing their safety function. This item was reportable under 10 CFR 50.73(a)(2)(i)(B) as a condition prohibited by the plant's Technical Specifications.

IV. CORRECTIVE ACTIONS

A. Upon notification of the air leakage from the SFP area, the Control Room immediately had the open door shut and, following review of SFP ventilation system flow requirements, suspended fuel movement in the SFP area.

B. Appropriate procedures are being revised to require verification that two Auxiliary Building air supply fans are operating or that the SFP area is maintaining negative pressure relative to the Auxiliary Building whenever the SFP ventilation system is required to be operable. Fuel movement will not resume until revision of the procedures and appropriate training of fuel handling personnel is completed. Fuel movement will be suspended in the event of the loss of one of two operating air supply fans, or a change in Auxiliary Building ventilation lineup with a single fan operating.

C. A Root Cause Analysis is under way to determine casual factors and generic implications for this event. The findings of this review will be included in a supplement to this report.

D. The STP was performed on January 24, 1997.

E. A review of all current STPs is underway to verify that additional STPs have not been missed. The results of this review will be reported in a supplement to this report.

V. ADDITIONAL INFORMATION

A. Affected Component Identification:

Component or System	IEEE 803 EIIS Funct	IEEE 805 System ID
SFP Ventilation Fan	FAN	VG
SFP Ventilation Filter	FLT	VG
Auxiliary Building Fan	FAN	VF
Auxiliary Building Radiation Monitor	RE	VF

B. Previous Similar Events:

Previous similar events will be discussed in a supplement to this report.