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May 15, 1995

U.S. Nuclear Regulatory Commission  
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant  
Unit No. 1; Docket No. 50-317; License No. DPR 53  
Licensee Event Report 95-001  
Entry Into Technical Specification 3.0.3 Due to Leaking Emergency Diesel  
Generator Fuel Pump

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,

CHC/CDS/bjd

Attachment

cc: D. A. Brune, Esquire  
J. E. Silberg, Esquire  
L. B. Marsh, NRC  
D. G. McDonald, Jr., NRC  
T. T. Martin, NRC  
P. R. Wilson, NRC  
R. I. McLean, DNR  
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## 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.

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

FACILITY NAME (1) Calvert Cliffs, Unit 1	DOCKET NUMBER (2) 05000 317	PAGE (3) 1 OF 8
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TITLE (4)  
Entry Into Technical Specification 3.0.3 Due to Leaking EDG Fuel Pump

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 NUMBERS(S)
04	15	95	95	-- 001 --	00	05	15	95	CC Unit 2	05000 318
										05000

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR (Check one or more) (11)					
		20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)		
POWER LEVEL (10)	100	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)			
		20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	OTHER		
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	(Specify in Abstract below and in Text, NRC Form 366A)		
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)			

## LICENSEE CONTACT FOR THIS LER (12)

NAME Craig Sly, Senior Engineer - Compliance	TELEPHONE NUMBER (include Area Code) 410-260-4858
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## 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)

YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-space typewritten lines) (16)

On April 15, 1995 at 0640, Calvert Cliffs Unit 1 entered Technical Specification 3.0.3 when an Emergency Diesel Generator (EDG) supplying backup power to two of the four 125-volt DC busses became inoperable due to the discovery of a leaking fuel injector pump after a surveillance test. The fuel injector pump was replaced and Technical Specification 3.0.3 was exited at 0932 that same morning. At the time the event occurred, Unit 1 was at 100 percent power and Unit 2 was in Mode 6, "Refueling," with the reactor vessel head off and Reactor Coolant System (RCS) temperature at 98 degrees.

The cause of the leakage was that the drain from the fuel injector pump was not draining properly.

All of the drain lines from the fuel injector pumps on all of the EDGs have been cleaned out. Long-term corrective actions are currently under development.

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LICENSEE EVENT REPORT (LER)				ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNB-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.	
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# I. DESCRIPTION OF EVENT

On April 15, 1995 at 0640, Calvert Cliffs Unit 1 entered Technical Specification Action Statement 3.0.3 because the Unit had less OPERABLE 125-volt DC busses than allowed under the Action Statements of the Technical Specification. The situation was created when an EDG supplying backup power to two of the four 125-volt DC busses became inoperable due the discovery of a leaking fuel injector pump after a surveillance test. The fuel injector pump was replaced and Technical Specification Action Statement 3.0.3 was exited at 0932 that same morning. At the time the event occurred, Unit 1 was at 100 percent power and Unit 2 was in Mode 6 "Refueling," with the reactor vessel head off and RCS temperature at 98 degrees Fahrenheit.

Calvert Cliffs Units 1 and 2 have three EDGs between the two units. No. 11 EDG may supply power to either Nos. 11 or 21 4 kV Engineered Safety Feature (ESF) busses. No. 21 EDG supplies power to No. 24 4 kV ESF. No. 12 EDG may supply power to either Nos. 14 or 21 4 kV ESF busses. (See Figure 1.)

The 125-volt DC and vital AC systems are designed to furnish continuous power to the plant vital instrumentation and control systems regardless of auxiliary electrical system condition. Calvert Cliffs Units 1 and 2 share four 125-volt DC busses (Nos. 11, 12, 21, and 22).

Unit 1 Technical Specification 3.8.2.3 requires that when operating in Modes 1-4, all four 125-volt DC busses must be operable. Technical Specification 3.8.2.3 Action a states with one 125-volt DC bus inoperable, restore the inoperable bus to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

Unit 2 Technical Specification 3.8.2.4 requires that while in Modes 5 and 6, at least two 125-volt DC busses and two 125-volt battery banks must be operable. If less than the above is operable, then the action requires immediate suspension of core alterations, establishment of containment closure, and immediate initiation of corrective actions to restore the minimum required equipment.

On April 15, 1995, just prior to the event, No. 21 EDG was out-of-service and being overhauled as part of the ongoing Unit 2 refueling outage. No. 11 EDG was fully operable with no activity. A fast start and one-hour run was performed on the swing diesel, No. 12 EDG. The fast start was part of an accelerated test program that was initiated by a previous fast start test failure of No. 12 EDG several weeks earlier. At the time No. 12 EDG was started, it was lined up to Unit 1 4 kV bus 14. In this lineup, No. 12 EDG was the emergency power supply to 125-volt DC bus 12 via battery charger 12,

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and 125-volt DC bus 21 via battery charger 13. No. 11 EDG was lined up to Unit 1 4 kV Bus 11. In this lineup No. 11 EDG was the emergency power supply to 125-volt DC bus 11 via Battery Charger 11, and 125-volt DC bus 22 via Battery Charger 14.

At 0442, a fast start of No. 12 EDG was performed. The EDG reached rated voltage and speed within its established acceptance criteria. At 0515, the test was officially completed and operators in the Control Room paralleled No. 12 EDG to 4 kV bus 14 and loaded it to 2400 kW to complete the one-hour run required after every start. By 0626, the one-hour run was complete and operators had unloaded No. 12 EDG from 4 kV bus 14 and shut it down in accordance with plant procedures.

At 0640, an Operator and System Engineer at No. 12 EDG discovered the No. 2 fuel injector pump was leaking excessively and the No. 10 fuel injector pump had a minor leak. They notified the Control Room and operators declared No. 12 EDG inoperable and performed the following actions:

For Unit 1;

Entered Technical Specification 3.8.1.1. Action Statement b for one inoperable EDG.

Entered Technical Specification 3.8.2.3 for one inoperable 125-volt DC bus.

For Unit 2;

Entered Technical Specification 3.8.2.2. Action Statement a for no operable 4 kV busses.

Entered Technical Specification 3.8.1.2 Action Statement a for less than two operable 125-volt DC busses.

Entered Technical Specification 3.9.8.1 Action Statement c for no operable Shutdown Cooling loops.

Entered Technical Specification 3.1.2.1 Action Statement for no operable boron injection flow paths.

Entered Technical Specification 3.1.2.3 Action Statement for no operable charging or high pressure safety injection pumps.

As a result of entering the above Action Statements, the order was given to immediately suspend all Unit 2 operations involving core alterations and



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positive reactivity changes and to close both Personal Air Lock doors. The Unit 1 breaker alignment verification required by Technical Specification 3.8.1.1 Action Statement b was also completed at 0720. At that time, operators expected No. 12 EDG repairs to be completed within two hours.

At 0840, efforts to return the EDG to an operable status were continuing. In reviewing the situation at that time, the operators in the Control Room determined that because of the lack of emergency power sources, two 125-volt DC busses were inoperable and had been since 0640. Consequently, they entered Technical Specification 3.0.3 and considered its effective time as 0640. At this point, Technical Specification 3.0.3 required that either No. 12 EDG be returned to an operable status or Unit 1 be in Hot Standby by 1340.

By 0932, No. 12 EDG repairs were complete and it was slow started and loaded successfully. No leakage was noted from the new fuel injector pumps. Operators declared No. 12 EDG operable and exited Technical Specification 3.0.3 and all of the other Technical Specification Action Statements that were entered as a result of the inoperability.

## II. CAUSE OF EVENT

The immediate cause of this event was gross leakage from the No. 2 fuel injector pump to No. 12 EDG. Initially, it was believed that the fuel injector pump leaks were the result of internal cracks. However, discussions with a diesel vendor representative, who was onsite for the No. 21 EDG overhaul during the Unit 2 refueling outage, indicated the cause of the leakage was that the drain from the fuel injector pump was not draining properly.

The plunger and barrel assembly of the fuel injector pumps are designed to pass some amount of fuel by the plunger as the pump operates. The fuel that bypasses the plunger assembly is drained off at the bottom of the pump body. (See Figure 2.) The fuel passes through drain lines and into a common header containing the drained fuel oil from other fuel injector pumps. With the drain line not draining properly, fuel oil built up in the body of the pump and eventually started leaking from the area where the control rack plunger enters the fuel pump.

Even with the fuel injector pump not internally cracked, as first thought, No. 12 EDG was still inoperable due to the leakage from No. 2 fuel injector pump. The leakage was considered significant enough to affect the operability of the EDG due to the fire hazard created by the fuel oil.

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The cause of the drain lines not draining properly is not positively known but is suspected to be accumulation of deposits inside the drain lines from years of service.

### III. ANALYSIS OF THE EVENT

This event is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B), "Any operation or condition prohibited by the plants Technical Specifications." The entry into Technical Specification Action Statement 3.0.3 is considered a plant condition prohibited by the Technical Specifications.

The 125-volt DC and vital AC systems are designed to furnish continuous power to the plant vital instrumentation and control systems regardless of auxiliary electrical system condition. The operability of the AC and DC power sources and associated distribution systems during operation ensures that sufficient power will be available to supply the safety related equipment required for 1) the safe shut down of the facility and 2) the mitigation and control of accident conditions within the facility.

The Technical Specification requirements of these power sources are consistent with the initial condition assumptions of the accident analyses and are based upon maintaining at least one of each of the onsite AC and DC power sources and associated distribution systems operable during accident conditions coincident with an assumed loss of offsite power and single failure of the other onsite AC source.

The Technical Specification requirements of the minimum specified AC and DC power sources and associated distribution systems during shutdown and refueling ensures that: 1) the facility can be maintained in the shutdown or refueling condition for extended time periods; and 2) sufficient instrumentation and control capability is available for monitoring and maintaining the facility status.

At the time the event occurred, Unit 1 was operating at 100 percent rated thermal power. Unit 2 was in a refueling outage in Mode 6 with the reactor vessel head removed and RCS temperature at 98 degrees Fahrenheit. No fuel movements were in progress on Unit 2. No. 21 EDG was out-of-service undergoing an upgrade and modifications to support installation of two new Station Blackout EDGs. When No. 12 EDG became inoperable, the plant entered a condition not covered by the Unit 1 Technical Specifications because two out of four 125-volt DC buses did not have an operable emergency backup power supply.

The loss of No. 12 EDG effectively resulted in Unit 1 being in a condition where it could not withstand a loss of offsite power and a failure of

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No. 11 EDG using only power sources credited in the Technical Specifications. The actual vulnerability was substantially reduced by the presence of a skid-mounted diesel generator which could have supplied the bus and battery chargers so that the DC busses would have performed their safety function. This diesel, which was both proceduralized and had been previously reviewed and credited in the Technical Specifications for an earlier period of the outage when No. 12 EDG was undergoing maintenance, would have also provided sufficient power to supply necessary decay heat removal and other safety functions for Unit 2. Because of this contingency capability, combined with the relatively short time that No. 12 EDG was inoperable and the very low probability of loss of all four sources of off-site power, this event did not present a significant increase in risk to the health and safety of the public or plant personnel.

#### IV. CORRECTIVE ACTIONS

Both Cylinder 2 and 10 fuel injector pumps that were found leaking were replaced and No. 12 EDG was restarted, loaded and run for one hour to verify the new pumps were performing satisfactorily.

All of the drain lines from all of the fuel injector pumps on all of the EDGs were cleaned out. Long-term corrective actions to ensure this event does not occur again in the future are currently being investigated.

#### V. ADDITIONAL INFORMATION

There have been no previous reportable events due to an EDG becoming inoperable as a result of fuel injector pump leakage.

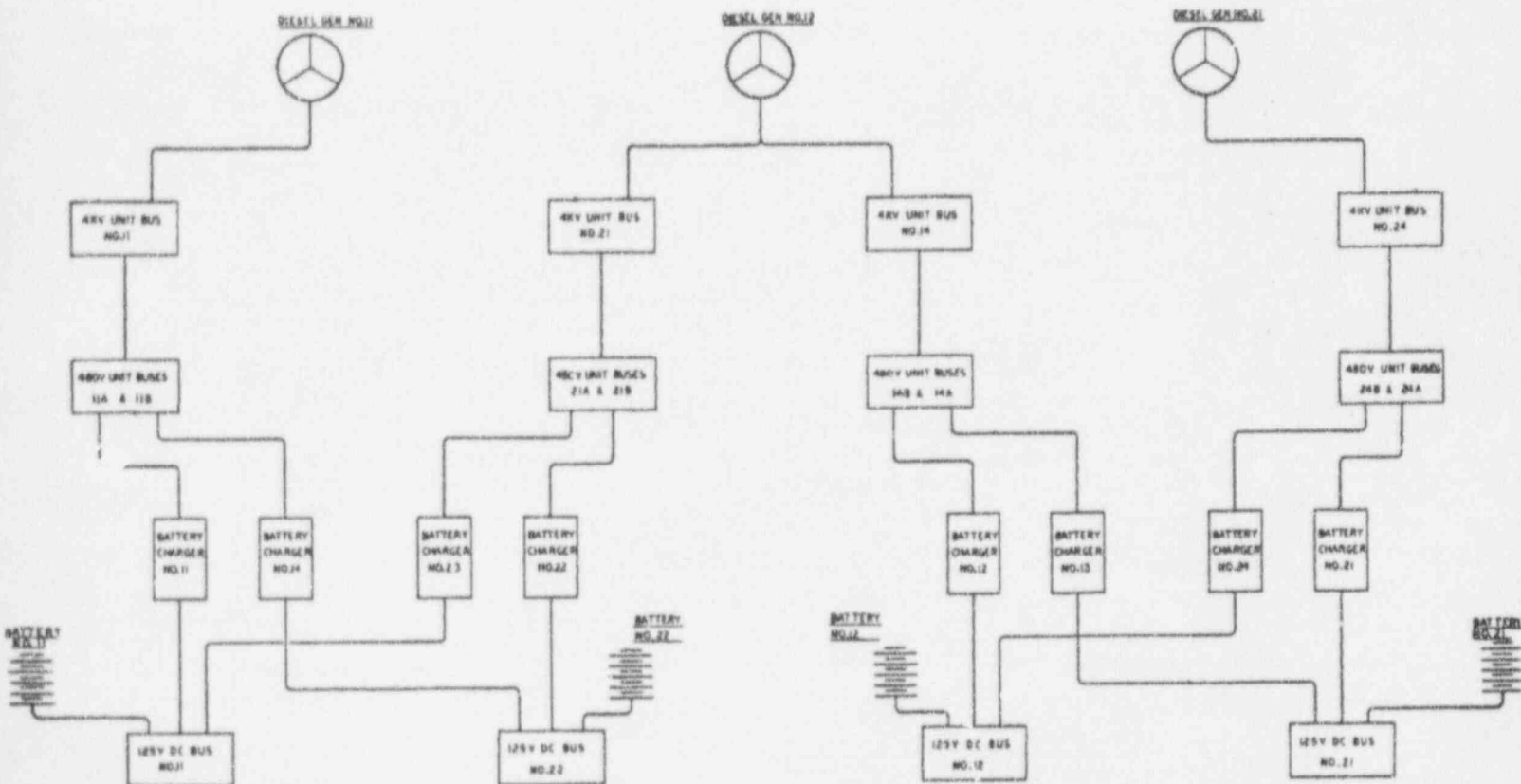
Identification of components referred to in the LER:

Component	IEEE 803 EIS Function	IEEE 805 System ID
Emergency Diesel Generator	DG	EK
Fuel Injector Pump	P	EK
125-volt AC Electrical System	N/A	EI
Battery Banks	BTRY	EI
125-volt DC Electrical System	N/A	EI

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FIGURE 1





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FIGURE 2

INJECTION PUMP ASSEMBLY .....

- 1 BODY, Pump Injection .....
- 2 PLUNGER & BARREL ASSEMBLY (V.E.) .....
- 3 SETSCREW, Barrel & Rack Locating .....
- 4 GASKET, Barrel Setscrew .....
- 5 GEAR, Rack Control .....
- 6 RACK, Plunger Control .....
- 7 SETSCREW, Barrel Locating .....
- 8 SLEEVE, Erosion Pump Body .....
- 9 WASHER, Plunger Spring Duplex .....
- 10 SPRING, Barrel Plunger .....
- 11 RETAINER, Plunger Spring .....
- 12 RING, Snap .....
- 13 VALVE ASSEMBLY, Delivery Injection Pump
- 14 SPRING, Discharge Valve .....
- 15 CAGE, Valve Pump Discharge .....
- 16 GASKET, O-Ring .....
- 17 YOKE, Cage .....
- 18 SCREW, Pump Control Rack .....
- 19 NUT 5/16-24 .....
- 20 SPRING, Control Rack .....
- 21 COLLAR, Control Rack .....
- 22 POINTER, Control Rack .....
- 23 SHIM .007 .....
- 24 SCREW 1/4-20x1/2 .....

