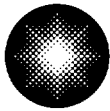


Peter E. Katz
Plant General Manager

1650 Calvert Cliffs Parkway
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410 495-4101



**Constellation
Nuclear**

**Calvert Cliffs
Nuclear Power Plant**

*A Member of the
Constellation Energy Group*

April 19, 2002

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 2002-01
Vital Bus Circuit Breaker Inoperable Due to Seismic Positioner Mounting

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,

PEK/MJY/bjd

Attachment

cc: R. S. Fleishman, Esquire
J. E. Silberg, Esquire
Director, Project Directorate I-1, NRC
D. M. Skay, NRC

H. J. Miller, NRC
Resident Inspector, NRC
R. I. McLean, DNR

IE22

LICENSEE EVENT REPORT (LER)

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

APPROVED BY OMB NO. 3150-0104 EXPIRES 7-31-2004

Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to: bj1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME

Calvert Cliffs Nuclear Power Plant, Unit 1

2. DOCKET NUMBER

05000 317

3. PAGE

1 OF 06

4. TITLE

Vital Bus Circuit Breaker Inoperable Due to Seismic Positioner Mounting

5. EVENT DATE

MO	DAY	YEAR
03	08	02

6. LER NUMBER

YEAR	SEQUENTIAL NUMBER	REV NO
2002	01	00

7. REPORT DATE

MO	DAY	YEAR
04	19	2002

8. OTHER FACILITIES INVOLVED

FACILITY NAME	DOCKET NUMBER
	05000
FACILITY NAME	DOCKET NUMBER
	05000

9. OPERATING
MODE

6

10. POWER
LEVEL

100

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 1: (Check all that apply)

20.2201(b)	20.2203(a)(3)(ii)	50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)
20.2201(d)	20.2203(a)(4)	50.73(a)(2)(iii)	50.73(a)(2)(x)
20.2203(a)(1)	50.36(c)(1)(i)(A)	50.73(a)(2)(iv)(A)	73.71(a)(4)
20.2203(a)(2)(i)	50.36(c)(1)(ii)(A)	50.73(a)(2)(v)(A)	73.71(a)(5)
20.2203(a)(2)(ii)	50.36(c)(2)	50.73(a)(2)(v)(B)	OTHER
20.2203(a)(2)(iii)	50.46(a)(3)(ii)	50.73(a)(2)(v)(C)	Specify in Abstract below or in
20.2203(a)(2)(iv)	50.73(a)(2)(i)(A)	50.73(a)(2)(v)(D)	NRC Form 366A
20.2203(a)(2)(v)	50.73(a)(2)(i)(B)	X 50.73(a)(2)(vii)	
20.2203(a)(2)(vi)	50.73(a)(2)(i)(C)	50.73(a)(2)(viii)(A)	
20.2203(a)(3)(i)	50.73(a)(2)(ii)(A)	50.73(a)(2)(viii)(B)	

12. LICENSEE CONTACT FOR THIS LER

NAME

TELEPHONE NUMBER (Include Area Code)

410-495-6652

Michael J. Yox, Engineering Analyst

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU- FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU- FACTURER	REPORTABLE TO EPIX
B	EK	BKR	W120	Y					

14. SUPPLEMENTAL REPORT EXPECTED

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

15. EXPECTED
SUBMISSION
DATE

MONTH	DAY	YEAR

16. ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On March 8, 2002, it was determined the 14B 480 Volt AC Vital Bus Supply Circuit Breaker (52-1413) was not operable since initial licensing of Unit 1 until breaker replacement occurred during maintenance on March 5, 2002. The 14B 480 Volt AC Vital Bus Supply Circuit Breaker (52-1413) was installed in the plant with the seismic positioner oriented upside down relative to the position in which the breaker was originally qualified for a Safe Shutdown Earthquake. This condition probably originated during field installation of the breaker during construction. Unit 1 was defueled when this condition was discovered. Unit 2 was operating at 100 percent power.

Event investigation concluded the seismic positioner was installed incorrectly since initial construction and the breaker was inoperable but functional in all conditions except during and after a Safe Shutdown Earthquake. All safety-related 480 Volt AC circuit breakers have been inspected. No other seismic positioners were found out of position.

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		2002	- 001	- 00	

17. NARRATIVE (If more space is required, use additional copies of NRC Form 366A)

I. DESCRIPTION OF EVENT

On March 7, 2002, with Unit 1 defueled and Unit 2 operating at 100 percent power, an electrician performing routine periodic maintenance on DS-416 Circuit Breaker CBB001 noticed the seismic positioner was installed upside down relative to the position in which the breaker was originally qualified for a Safe Shutdown Earthquake (SSE). The circuit breaker is a Westinghouse Electric Corporation (Westinghouse), safety-related, 480 Volt AC 'DS' style circuit breaker which had been installed in Breaker Cubicle 52-1413 until March 5, 2002. Circuit Breaker 52-1413 supplies 480 Volt AC power to the Unit 1 14B AC Vital Bus.

During the maintenance, the electrician noticed the seismic positioner of the removed breaker was installed upside down relative to seismic positioners observed on other Westinghouse, 480 Volt AC circuit breakers. Further investigation verified the seismic positioner was installed incorrectly. Immediate action was taken to reinstall the seismic positioner correctly.

Issue Report IR3-065-117 was prepared to document the degraded/non-conforming condition of the breaker in the corrective action system. The issue report noted the condition was corrected when the breaker was replaced during maintenance and the original breaker (CBB001) was no longer in the system. The seismic positioner on CBB001 had also been returned to the correct configuration.

Westinghouse was contacted to determine the operability of the circuit breaker in the as-found condition, with the seismic positioner installed upside down. On April 3, 2002, Westinghouse informed Plant Engineering the circuit breaker would function in all design conditions other than a SSE. The seismic positioner, as installed, would probably not have prevented failure of the circuit breaker secondary contacts during a SSE. The circuit breaker was, therefore, inoperable due to a probable loss of design function during a SSE.

On March 13, 2002, all safety-related, Westinghouse, 480 Volt AC circuit breakers on site were inspected to ensure their seismic positioners were installed correctly. All circuit breakers inspected were found to have correctly installed seismic positioners. Further investigation revealed the 14B 480 Volt AC Bus Circuit Breaker was probably installed incorrectly during Unit 1 initial construction.

This event is considered applicable to Unit 1 only, because no similar deficiencies were observed during the inspection of all related equipment on Unit 2.

Unit 1 Circuit Breaker 52-1413 provides isolation between the low voltage side of the 14B 4160 – 480 Volt AC Service Transformer and the 14B 480 Volt AC Vital Bus. The 14B 480 Volt AC Vital Bus supplies safety-related and non-safety-related 480 Volt AC loads. Since the initial startup of Unit 1, the safety-related loads supplied by the 14B 480 Volt AC Vital Bus have been inoperable due to the degraded/non-conforming condition of Circuit Breaker 52-1413. Safety-related loads supplied by 14B 480 Volt AC Vital Bus included 12 Hydrogen Recombiner, 13 Containment Filter

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Unit, 12 125 Volt DC Battery Charger, 13 Component Cooling Pump, 12 Charging Pump, and 14 Containment Air Cooler.

II. CAUSE OF EVENT

The root cause of this event was a quality issue related to the vendor and lack of adequate acceptance testing during initial construction of Unit 1. The 14B 480 Volt AC Vital Bus Supply Circuit Breaker 52-1413 was installed with the seismic positioner mounted upside down. Similar Westinghouse, safety-related 480 Volt AC breakers at Calvert Cliffs were installed with the seismic positioners oriented correctly.

The seismic positioner mounting bolt holes allow installation in the correct position or upside down. A review of the maintenance history for the Unit 1 14B 480 Volt AC Vital Bus Supply Circuit Breaker 52-1413 did not reveal any instances where the circuit breaker had been removed from its original cubicle location since initial startup, with the exception of temporary removal and reinsertion for periodic maintenance. Westinghouse tracked the shop order number of the breaker that was shipped to Calvert Cliffs Nuclear Power Plant, including eight other 'DS' type breakers, and could not determine if the shop order included directions to field-install the seismic positioner on the breaker. Westinghouse has confirmed they have received no other reports concerning upside down mounting of the seismic positioner on DS breakers.

III. ANALYSIS OF EVENT

The 480 Volt AC system is designed to function reliably and supply power during normal operation and under accident conditions. The 480 Volt AC engineered safety features (ESF) electrical system meets the single-failure criterion as defined in Institute of Electrical and Electronics Engineers 279, Section 4.2, and is designed as a Class 1E system for seismic restraint.

The 480 Volt unit load centers consist of metal-clad switchgear with draw-out air circuit breakers. This equipment is designed to function properly during all design conditions, including SSE accelerations.

Four of the 480 Volt unit load centers for each unit (11A, 11B, 14A, and 14B for Unit 1; 21A, 21B, 24A, and 24B for Unit 2) supply power to ESFs. Number 11A/B Busses and 14A/B Busses feed redundant ESF equipment. The redundant busses are supplied from separate emergency diesel generators (EDGs) through the 4.16 kV/480 Volt unit service transformers. Similarly, two of the motor control centers (MCCs) for each unit (MCC 104R and MCC 114R for Unit 1, MCC 204R and MCC 214R for Unit 2) supply power to redundant ESF trains. Each of the two busses per unit are supplied from separate EDGs via the 480 Volt unit load centers. Redundant ESF 480 Volt busses are located in separate Seismic Category I rooms.

During normal operation, all incoming bus breakers and MCC feeder breakers are closed. The tie breakers between MCCs 104R-114R, 101AT-101BT, 204R-214R, and 201AT-201BT are

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normally open and are closed only for an emergency or maintenance. Each 480 Volt AC Vital Bus Supply Breaker supplies the dedicated safety-related loads on the associated bus. Key interlocks are provided to prevent simultaneous closure of the tie breakers and both MCC feeder breakers. The operation of the bus tie is a manual function only.

Westinghouse conducted seismic testing on this type of breaker with the seismic positioner in the correct orientation. Seismic qualification was based on the breaker installation matching the tested configuration. The as-found configuration of Circuit Breaker CBB001 resulted in a degraded/non-conforming condition, which fails to ensure the component is capable of meeting its design function during a SSE. The breaker has been determined to be functional during all other design conditions. Number 14B 480 Volt AC Vital Bus Supply Circuit Breaker (52-1413) was, therefore, inoperable since initial startup of Unit 1 until the breaker was replaced on March 5, 2002.

This event is considered reportable in accordance with 10 CFR 50.73(a)(2)(i)(B); "Any operation or condition which was prohibited by the plant's Technical Specifications."

With a Unit in Mode 1, 2, 3, or 4, and one or more AC vital busses inoperable, Calvert Cliff's Technical Specification 3.8.9, Required Action B.1 requires the following:

Restore AC vital bus subsystems to OPERABLE status within 2 hours AND within 16 hours from discovery of failure to meet Limiting Condition for Operation or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

With a Unit in Mode 5 or 6, during movement of irradiated fuel assemblies, and one or more required AC, DC, or AC vital bus electrical power distribution subsystems inoperable, Calvert Cliff's Technical Specification 3.8.10, requires the following:

Action A.1: Immediately declare associated supported required feature(s) inoperable, OR, Action A.2, Immediately suspend core alterations and movement of irradiated fuel assemblies; and initiate actions to suspend operations involving positive reactivity additions; and initiate actions to restore required AC, DC, and AC vital bus electrical power distribution subsystems to OPERABLE status; and declare associated required shutdown cooling subsystem(s) inoperable and not in operation.

When the inoperability of 14B 480 Volt AC Vital Bus Supply Circuit Breaker (52-1413) was discovered, Unit 1 was in a defueled condition. The degraded/non-conforming condition was restored when the breaker was replaced with a spare breaker for maintenance. Number 14B 480 Volt AC Vital Bus operability had already been restored when the degraded/non-conforming condition was discovered, therefore, no additional immediate actions were taken.

A significance determination process assessment was performed for the inoperability of Unit 1 14B 480 Volt AC Vital Bus Supply Circuit Breaker (52-1413). This assessment determined a core

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damage frequency change of less than 1.0E-6/year. The large early release frequency change associated with this issue is less than 1.0E-7/year.

IV. CORRECTIVE ACTIONS

- A. All safety-related Westinghouse 480 Volt AC Circuit Breakers have been re-inspected to ensure the seismic positioners are correctly installed. No additional breakers were found to have the seismic positioner incorrectly installed.
- B. Electrical Functional Test Procedures 52, 53, 76, and 77 are being revised to ensure the inspections of Westinghouse 480 Volt AC 'DS' style circuit breaker seismic positioner installations are adequate.

V. ADDITIONAL INFORMATION

A. Component Identification

Component	IEEE 803 EIS Function	IEEE 805 System ID
Circuit Breaker 52-1413	BKR	EK

- B. A previous reportable event involving seismic mounts on circuit breakers at Calvert Cliffs occurred on March 3, 1998 and was documented via Calvert Cliffs LER 317/98-004, "Battery Charger Circuit Breakers Missing Seismic Positioner." All Westinghouse, safety-related, 480 Volt AC, "DS" type circuit breakers were inspected in 1998 to ensure seismic positioners were installed as a result of LER 317/98-004, "Battery Charger Circuit Breakers Missing Seismic Positioner." The scope of the inspections at that time was specifically to verify the seismic positioners were installed. The mispositioning of the seismic positioner on Circuit Breaker 52-1413 was not discovered during the 1998 inspections performed in support of LER 317/98-004. In 1998, the inspection method involved observing the positioner from the opened circuit breaker door. This method was deemed, at the time, the least intrusive approach which met the objective of verifying the positioner was present.

The inspections performed in response to the most recent event involved viewing the positioner through the open door of the cubicle immediately above the circuit breaker in question. Breakers on the top row of cubicles required removal from service and were opened for this inspection. This method was found to allow verification of correct mounting while still allowing most breakers to remain in service, minimizing operational disruptions.

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C. Number and location of Westinghouse 480 Volt AC 'DS' style circuit breakers:

Location	Number of Breakers
Unit 1 27' Switchgear	24
Unit 1 45' Switchgear	24
Unit 2 27' Switchgear	24
Unit 2 45' Switchgear	24
No. 1A Emergency Diesel Generator Building	4