

PETER E. KATZ
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June 4, 1998

U.S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit No. 2; Docket No. 50-318; License No. DPR 69
Licensee Event Report 98-003
Relays Out-of-Calibration Due to Bumped Dial and Actions Not Taken

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,

A handwritten signature in black ink, which appears to read "Peter Katz". The signature is written in a cursive, flowing style.

PEK/JV/bjd

Attachment

cc: R. S. Fleishman, Esquire
J. E. Silberg, Esquire
A. W. Dromerick, NRC
S. S. Bajwa, NRC

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

9806100232 980604
PDR ADUCK 05000318
S PDR

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LICENSEE EVENT REPORT (LER)

(See reverse for required number of
digits/characters for each block)ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY
INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS
LEARNED ARE INCORPORATED INTO THE LICENSING 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.

FACILITY NAME (1)

Calvert Cliffs Nuclear Power Plant, Unit 2

DOCKET NUMBER (2)

05000 318

PAGE (3)

1 OF 05

TITLE (4)

Relays Out-of-Calibration Due to Bumped Dial and Actions Not Taken

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
05	07	98	98	003	00	06	04	98	FACILITY NAME	DOCKET NUMBER
										05000
										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)				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

J. Volkoff

TELEPHONE NUMBER (include Area Code)

410-495-3649

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

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

On May 7, 1998 from 1743 to 2135, Calvert Cliffs Unit 2 Engineering Safety Features Actuation System (ESFAS) Undervoltage Relay Channel ZF was inoperable due to being bumped out-of-calibration. Channel ZF was not placed in bypass or trip within one hour as required by Technical Specification 3.3.2.1, Action b, Action Statement 7. From 1743 to 1832, two channels of ESFAS undervoltage relays were inoperable, and Limiting Condition for Operation 3.0.3 should have been entered. These conditions were the result of the B phase dial on ESFAS Undervoltage Relay Channel ZF being moved during reinstallation of the protective cover. The causes of the event were that the cover was installed upside down by a technician and the cover design allowed it to be installed improperly. There were no adverse safety consequences as a result of this event. The Undervoltage Relay Channel ZF was made operable at 2135 May 7, 1998 by calibration. Technicians will be trained on the event, protective covers of similar design will be identified and clearly marked, and procedures will be enhanced where appropriate.

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

I. DESCRIPTION OF EVENT

On May 7, 1998 from 1743 to 2135, Calvert Cliffs Unit 2 Engineering Safety Features Actuation System (ESFAS) Undervoltage Relay Channel ZF was inoperable due to being bumped out-of-calibration. Channel ZF was not placed in bypass or trip within one hour as required by Technical Specification 3.3.2.1, Action b, Action Statement 7. From 1743 to 1832, the ESFAS Undervoltage Relay Channel ZG was placed in bypass for testing, which with Channel ZF being inoperable made two channels of ESFAS undervoltage relays inoperable, and Limiting Condition for Operation (LCO) 3.0.3 should have been entered. These conditions were the result of the B phase dial on ESFAS Undervoltage Relay Channel ZF being moved during reinstallation of the protective cover after testing at approximately 1743. At the time Unit 2 was in Mode 1 at normal operating temperature and pressure.

Unit 2 has two dedicated safety-related diesel generators to provide a source of emergency power when offsite power is unavailable. Undervoltage protection will generate a loss of voltage start in the event a loss of voltage, degraded voltage, or steady state degraded voltage condition occurs. There are three loss of voltage start functions: loss of voltage, degraded voltage, and steady state degraded voltage for each 4.16 kV vital bus (numbers 21 and 24).

Each of the redundant 4.16 kV Class 1E busses is equipped with three sets of four redundant and independent undervoltage relays. The first set of four relays is set to provide a two-out-of-four undervoltage signal upon a loss of bus voltage. The second set of four relays is set to provide a two-out-of-four undervoltage signal on a transient bus undervoltage. The third set of four relays provide a two-out-of-four undervoltage signal upon a sustained bus undervoltage. The relay channels are numbered ZD, ZE, ZF, and ZG.

Technical Specification LCO 3.3.2.1 Table 3.3-3 (Total No. of Channels) requires four channels per bus of the 4.16 kV Emergency Bus Undervoltage (loss of voltage), four channels per bus of the 4.16 kV Emergency Bus Undervoltage (transient degraded voltage), and four channels per bus of the 4.16 kV Emergency Bus Undervoltage (steady state degraded voltage) be Operable in Modes 1, 2, and 3. In the Minimum Channels Operable column, three channels per bus are required to be Operable in Modes 1, 2, and 3. For this situation, Technical Specification LCO 3.3.2.1 Action b, Action Statement 7 requires that with the number of Operable channels one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:

- a. The inoperable channel is placed in either the bypassed or tripped condition within one hour . . . , and

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- b. Within one hour, all functional units receiving an input from the inoperable channel are also placed in the same condition (either bypassed or tripped, as applicable) as that required by a. above for the inoperable channel, and
- c. The Minimum Channels Operable requirement is met; however, one additional channel may be bypassed for up to 48 hours while performing tests and maintenance on that channel provided the other inoperable channel is placed in the tripped condition.

The ESFAS undervoltage relays are General Electric Model SLV-11A. They support the loss of voltage, transient degraded voltage, and steady state degraded voltage functions. The protective cover for the relay has four connecting bol's, one in each corner of the frame, a glass face, and all the parts of the frame and bolts are black. A button at the bottom of the cover resets the relay trip indication. The button moves a metal wire, not visible from the outside, that moves a metal tab approximately two thirds of the way up the left side of the relay, inside the cover. The button is the same color black as the frame and does not extend beyond the frame. The protective cover looks exactly the same right side up or upside down except for the black button on the bottom side. The dials for setting the three phases of the relay are located approximately one third of the way up on the right side of the relay. If the protective cover is installed upside down, the tab intended for resetting the relay trip indication almost touches the relay B phase dial. The relays contain an upper and lower block inside the relay box, providing the electrical connection for the relay, for which the protective cover has moveable metals tabs to prevent the cover from being installed without the blocks installed.

On May 7, 1998, at 1500, two technicians began testing on the 24 bus undervoltage relays, in order, starting with Channel ZD. At 1703, Channel ZE testing was completed, and Channel ZF testing began. After testing and proper dial adjustment for calibration, the first technician reinstalled the protective cover on the Channel ZF relay. The test on Channel ZF was reported satisfactory at 1743. The second technician noticed the cover had been installed upside down because the mechanical reset button was on the top of the cover instead of on the bottom. The first technician removed the cover and reinstalled it right side up. At 1743, Channel ZG was bypassed, and testing began on Channel ZG. As testing began on Channel ZG, the second technician noticed that the B phase dial setting for Channel ZF was slightly off from where he thought the setting had been after adjustment. He asked the first technician, who agreed the position looked different than he remembered it. At 1832, the testing for all channels was completed, Channel ZG was unbypassed, and the plant exited Technical Specification LCO 3.3.2.1.

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After discussing their concern about the position of Channel ZF B phase dial with their supervisor, the two technicians wrote an issue report regarding the matter and brought it to the Operations Shift Manager at 1900. The plant entered Technical Specification LCO 3.3.2.1 Action b, Action Statement 7 because No. 24 4.16 kV vital bus Channel ZF phase B was potentially out of calibration. At 2105, channel ZF phase B was found out-of-calibration, and at 2135, the setting and testing of Channel ZF was completed satisfactorily. Technical Specification LCO 3.3.2.1 Action b, Action Statement 7 was exited.

II. CAUSE OF EVENT

The protective cover on the No. 24 4.16 kV vital bus Channel ZF relay was installed upside down after relay testing and adjustment. A relay indication reset tab apparently brushed the B phase dial, putting phase B out-of-calibration. This was caused by the technicians not noting the location of the reset button when reinstalling the cover. The button is on the bottom side of the cover, but was on the top when the cover was reinstalled. Another cause is that the covers could physically be installed upside down, and there is no clear visible indication of which side is the top. The General Electric Model SLV-11A relays can be installed upside down because the covers are of uniform size and shape top and bottom, including having metal tabs top and bottom detecting whether blocks are installed in the relays. Many other relays only have top or bottom blocks, so the tabs detecting whether the blocks are installed would allow only allow proper cover installation. Other covers also have relay indication reset buttons with exposed metal or a distinguishing shape to make them clearly visible, or the appearance of their top and bottom areas are clearly different. The buttons on the model SLV-11A relays are the same matte black color as their background, the cover frame.

III. ANALYSIS OF EVENT

This event did not have significant safety consequences. Two of the No. 24 4.16 kV vital bus relays were inoperable for 49 minutes from 1743 to 1832. The LCO 3.0.3 allows one hour before commencement of shutdown is required, so no actions different than those taken would have been required. Having one channel in bypass and one channel inoperable would have required both remaining channels for the 4.16 kV Emergency Bus Undervoltage (steady state degraded voltage) to actuate if an event had occurred. Although the Channel ZF was inoperable by itself for 3 hours and 3 minutes from 1832 to 2135, the system still had two-out-of-three logic, and the relays had just been adjusted and tested, so they would have been expected to operate properly.

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The event is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B), Any event or condition prohibited by the plant's Technical Specifications, based on two ESFAS undervoltage channels being inoperable for 49 minutes, that would have required entry into LCO 3.0.3, and inoperability of ESFAS undervoltage Channel ZF for 3 hours and 52 minutes without placing the channel in trip or bypass within one hour as required by the action statement.

IV. CORRECTIVE ACTIONS

- A. Training will be conducted for technicians on the event.
- B. Relay protective covers of similar design will be identified and clearly marked to help ensure they are installed properly
- C. Procedures will be enhanced where appropriate to minimize the possibility of the protective covers being installed incorrectly and to check that the calibration dials are set appropriately.

V. ADDITIONAL INFORMATION

- A. Affected Component Identification:

Component or System	IEEE 803 EIIIS Function	IEEE 805 System ID
Relay, Undervoltage	27	EK

- B. There were no previous similar events.