

## LICENSEE EVENT REPORT (LER)

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

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.

FACILITY NAME (1)

MONTICELLO NUCLEAR GENERATING PLANT

DOCKET NUMBER (2)

05000 - 263

PAGE (3)

1 OF 5

TITLE (4)

Instantaneous Trip of 480 VAC MCCBs Do Not Meet  
Acceptance Criteria Due to Manufacturer's Design

EVENT DATE (5)			LER NUMBER (6)			REPORT NUMBER (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
03	24	94	94	002	01	08	02	94		05000
OPERATING MODE (9)			THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
N			20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)	
POWER LEVEL (10)			20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)	
100			20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		XX OTHER	
			20.405(a)(1)(iii)		50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		(Specify in Abstract below and in Text, NRC Form 366A)	
			20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)			
			20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)		Voluntary Rpt	

## LICENSEE CONTACT FOR THIS LER (12)

NAME

Steve Porter

TELEPHONE NUMBER (Include Area Code)

(612) 295-1497

## COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPDOS

## SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)	XX	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR

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

During routine plant preventative maintenance testing of a Klockner Moeller 480 VAC 3 phase molded case circuit breakers, it was discovered that the breaker tripped at a current below the lower tolerance for the instantaneous trip. Spare breakers of the same model number produced similar test results. The tests results were verified by an independent testing laboratory. The cause is believed to be the design of the breakers. In all cases, sufficient margin exists above requirements to ensure successful load operation. Motor starting, reduced voltage conditions, and fuse/breaker coordination were all considered. This report is a voluntary report as this issue caused no safety problem at Monticello. An Institute For Nuclear Power Operations - Nuclear Network item was issued on March 28, 1994 to inform the industry of this issue.

REQUIRED NUMBER OF DIGITS/CHARACTERS  
FOR EACH BLOCK

BLOCK NUMBER	NUMBER OF DIGITS/CHARACTERS	TITLE
1	UP TO 46	FACILITY NAME
2	8 TOTAL 3 IN ADDITION TO 05000	DOCKET NUMBER
3	VARIES	PAGE NUMBER
4	UP TO 76	TITLE
5	6 TOTAL 2 PER BLOCK	EVENT DATE
6	7 TOTAL 2 FOR YEAR 3 FOR SEQUENTIAL NUMBER 2 FOR REVISION NUMBER	LER NUMBER
7	6 TOTAL 2 PER BLOCK	REPORT DATE
8	UP TO 18 -- FACILITY NAME 8 TOTAL -- DOCKET NUMBER 3 IN ADDITION TO 05000	OTHER FACILITIES INVOLVED
9	1	OPERATING MODE
10	3	POWER LEVEL
11	1 CHECK BOX THAT APPLIES	REQUIREMENTS OF 10 CFR
12	UP TO 50 FOR NAME 14 FOR TELEPHONE	LICENSEE CONTACT
13	CAUSE VARIES 2 FOR SYSTEM 4 FOR COMPONENT 4 FOR MANUFACTURER NPRDS VARIES	EACH COMPONENT FAILURE
14	1 CHECK BOX THAT APPLIES	SUPPLEMENTAL REPORT EXPECTED
15	6 TOTAL 2 PER BLOCK	EXPECTED SUBMISSION DATE

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TEXT CONTINUATION

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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
MONTICELLO NUCLEAR GENERATING PLANT	05000 - 263	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	OF 2 5
		94	- 002 -	01	

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

Description:

On March 24, 1994, the plant was operating at 100% power when an anomaly associated with Klockner Moeller molded case circuit breaker (MCCBs)(EIIS Component Function Identifier - 52) was discovered. While performing routine testing of a Class 1E 480 VAC three phase, Klockner Moeller molded case circuit breaker (Model Number ZM6-33-200.oBi-CNA, purchased in 1982), it was observed that adjustment of the instantaneous trip (magnetic trip) did not result in the expected trip setpoint response.

During subsequent testing of the instantaneous trip, breakers were found to deviate from the trip setpoint at higher settings. The deviation was small for low set points and increased as the setpoint was increased (See attached Figure). The results were consistent for each pole (phase) tested. Spare breakers of the same model number were tested; all of which produced nearly identical results. Two additional Klockner Moeller molded case circuit breaker models (including a breaker procured in 1993) were tested and exhibited similar characteristics. These other models, however, were not outside of allowed tolerances. The testing was performed by experienced plant electricians in accordance with the requirements of UL (Underwriters Laboratory) Standard 489. The results were confirmed by an independent testing laboratory.

These Klockner Moeller molded case circuit breakers are used in essential motor control centers (EIIS System Code - EC). All essential Klockner Moeller molded case circuit breakers are included in the Monticello preventative maintenance program. This provides assurance that any future problems will also be identified.

Cause:

The primary cause of this event is believed to be the design of the molded case circuit breaker. All Klockner Moeller 480 VAC molded case circuit breakers exhibited the trend shown in the attached figure. The trend was consistent between phases, models and manufacturing period. Breakers manufactured by others did not exhibit this trend. The issue identified does not appear to be the result of degrading equipment. Breakers procured in 1993 exhibited similar characteristics to those procured in 1982. Test data taken in 1982 appears to correspond to current data. Test results were very consistent from pole to pole and from breaker to breaker. These facts lead to the conclusion that age is not a cause of this characteristic.

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A contributing cause was the inadequate acceptance criteria specified during the initial motor control center breaker installation. During installation in 1982, the acceptance band provided was the adjustable range for the instantaneous over current trip, rather than being a function of the established setpoint. This inadequate acceptance criteria prevented the condition from being identified during initial motor control center breaker installation. Current acceptance testing methods would identify this problem.

The condition could have been identified during the 1991 breaker testing. However, the testing procedure lacked sufficient detailed guidance to identify the anomaly.

Analysis:

The report is a voluntary report as this issue caused no safety problem at Monticello. It could, however, be of interest to the NRC. An Institute For Nuclear Power Operations - Nuclear Network item was issued on March 28, 1994 to inform the industry of this issue.

The discrepancy identified exists only where the instantaneous setpoint is set above the minimum setting. At settings greater than minimum, the trip would occur at currents below the setting. The primary concern of breakers tripping early (at a lower current than desired) is the resultant loss of equipment when no fault or electrical problem exists, for example, during a pump start. Therefore, a review was conducted of those Klockner Moeller molded case circuit breakers with the instantaneous trip setpoints greater than minimum. In all cases, sufficient margin exists above requirements to ensure successful load operation even with the setpoint at minimum. Motor starting, reduced voltage conditions, and fuse/breaker coordination were all considered.

Load operability has been demonstrated numerous times since the Klockner Moeller molded case circuit breakers were installed. Loads supplied by the molded case circuit breakers have been started many times for surveillance procedures. No problem with these breakers tripping unnecessarily has occurred. Operating history, therefore, provides further assurance of load operability.

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Corrective Action:

- 1) The industry was informed of this event via Nuclear Network.
- 2) Klockner Moeller was informed of this issue and a breaker was shipped to them for testing.
- 3) An independent laboratory has confirmed our test results on a Model ZM6-33-200.oBi-CNA breaker.
- 4) The preventative maintenance procedure for the 480 VAC molded case circuit breakers was revised for further clarification for testing the instantaneous trip.

Additional Information:

Failed Component Identification: NONE

Previous Similar Event: NONE

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## Instantaneous Trip Setting vs Actual Current to Trip

