



Nebraska Public Power District

COOPER NUCLEAR STATION  
P.O. BOX 98, BROWNVILLE, NEBRASKA 68321  
TELEPHONE (402) 82-3811

CNSS923636

May 8, 1992

U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, D.C. 20555

Dear Sir:

Cooper Nuclear Station Licensee Event Report 92-006, Revision 0, is being forwarded as an attachment to this letter.

Sincerely,

R. L. Gardner  
Acting Division Manager  
of Nuclear Operations  
Cooper Nuclear Station

RLG/bjs

Attachment

cc: R. D. Martin  
G. R. Horn  
J. M. Meacham  
R. E. Wilour  
V. L. Wolstenholm  
D. A. Whitman  
INPO Records Center  
NRC Resident Inspector  
R. J. Singer  
CNS Training  
CNS Quality Assurance

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) <b>Cooper Nuclear Station</b>	DOCKET NUMBER (2) <b>0500002981</b>	PAGE (3) <b>1 OF 05</b>
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TITLE (4): **Technical Specification Violation Due To Inoperable 250 Volt Battery Chargers Caused By Equipment Deficiencies**

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
04	08	92	92	006	00	05	08	92	
									DOCKET NUMBER(S) 050000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § (Check one or more of the following) (11)

OPERATING MODE (9) <b>N</b>	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.406(c)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(b)
POWER LEVEL (10) <b>100</b>	<input type="checkbox"/> 20.406(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(vi)	<input type="checkbox"/> 73.71(e)
	<input type="checkbox"/> 20.406(a)(1)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	<input type="checkbox"/> 20.406(a)(1)(iii)	<input checked="" type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	
	<input type="checkbox"/> 20.406(a)(1)(iv)	<input type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(viii)(B)	
	<input type="checkbox"/> 20.406(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)	

LICENSEE CONTACT FOR THIS LER (12)

NAME <b>John R. Myers</b>	TELEPHONE NUMBER AREA CODE: <b>402</b> NUMBER: <b>825-13811</b>
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC
X	EI	BYCC	173	Y					

SUPPLEMENTAL REPORT EXPECTED (14)

<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewriter lines) (16)

On April 7, 1992, at 7:31 a.m., the 1B 250 V Battery Charger input breaker tripped. Following an investigation, the 1B Battery and Charger were declared inoperable and the Technical Specification LCO entered. On April 8, 1992, at 1:23 p.m., the input breaker to the 1A 250 V Battery Charger tripped, resulting in the 1A Charger being inoperable. After an inspection, the charger was re-energized, but tripped again approximately 1 minute later. The float voltage was adjusted, and the charger returned to operation at 1:52 p.m. Several hours later, approximately 30 minutes after an additional voltage adjustment, the 1A Charger tripped again. The voltage adjustment potentiometer was exercised several times and the charger returned to service, following which the unit operated satisfactorily. Both chargers being out of service resulted in operation prohibited by the Technical Specifications. The 1B Charger was returned to service at 11:18 a.m. on April 9. Additional troubleshooting of the 1A Charger was subsequently performed.

The cause of the trip of the 1B Charger could not be definitively established. Troubleshooting found a failed electronic board, but this discrepancy would not cause the charger to trip without producing any fault indication. The failure of the 1A Charger was due to inadequate preventive maintenance combined with setpoint drift of the high voltage shutdown relay. Both chargers were repaired, tested, and returned to service. Preventive maintenance for the chargers will be enhanced, and additional investigations into the failure of the relay in the 1A Charger will be performed.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-530) U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1)

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Cooper Nuclear Station

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91	006	00

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TEXT (If more space is required, use additional NRC Form 306A's) (17)

A. Event Description

On April 7, at approximately 7:30 a.m., station electricians opened the cabinet door to the 1B 250 Volt Charger to measure the float voltage for Surveillance Procedure 6.3.15.1, 125/250 V Station and Diesel Fire Pump Battery Quarterly Check. Shortly after opening the door, the power supply breaker for the 1B Charger tripped. An inspection of the charger was made, and, finding no evidence of a problem, the charger was re-energized. The charger did not appear to load properly, and, following further investigation, the 1B Charger and 1B Battery were declared inoperable as of 7:31 a.m. At 9:45 a.m., the spare charger, 1C, was placed in operation supplying the 1B Battery. Because the Appendix R analysis for a change in Fire Zones for the battery room area and the separation criteria power cables had not been completed, the 1B Battery was not declared operable with the 1C Charger connected. In accordance with Technical Specification LCO requirements, the operability of Reactor Core Isolation Cooling (RCIC), Residual Heat Removal, and Core Spray were verified, and the appropriate surveillance for the Automatic Depressurization System was performed. At 5:26 p.m., the 24 hour notification required by Technical Specifications was made.

At 1:22 p.m. on April 8, an intermittent ground alarm for the 1A 250 Volt Charger was received. At 1:23, the input breaker tripped, apparently due to high voltage. An inspection was performed, and no evidence of a problem found. The breaker was reset and the charger restarted, however, the charger tripped again after approximately one minute of operation. A minor adjustment was made to the output voltage, the unit re-energized, and the charger returned to service at 1:52 p.m. The charger tripped again at 4:49 p.m., approximately 30 minutes after the output voltage had been adjusted a second time. The float voltage potentiometer was exercised several times in both directions and the charger placed back in service at 5:11 p.m. The output voltage was adjusted to the proper value, following which the unit operated satisfactorily. Since the 1A charger was restored to operation in an expeditious manner during each event, a decrease in power was not initiated.

At approximately 6:00 p.m., the 1B Charger was placed back in service (but not declared operable). On April 9, at 11:18 a.m., following the completion of post maintenance testing, the 1B Charger and 1B Battery were declared operable.

Additional troubleshooting of the 1A Charger was performed after the 1B Charger was returned to service. During this troubleshooting, the high voltage shutdown (K-3) relay was found to trip at approximately 272 - 273 V DC, instead of the nominal setpoint of 286 V DC. After 5 such tests, the relay failed, and was replaced. The 1A Charger was returned to service at 11:44 a.m. on April 10. The 1A Battery was powered by the 1C Charger while the 1A Charger was out of service.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-830), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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TEXT (If more space is required, use additional NRC Form 365A's) (17)

B. Plant Status

The plant was in operation at approximately 100 percent power.

C. Basis for Report

Tripping of the 1A Charger with the 1B Charger inoperable resulted in the plant exceeding the Technical Specification LCO of Section 3.9.B.1.c.1, and is reportable per 10CFR50.73 (a)(2)(i)(B), an operation prohibited by the Technical Specifications.

D. Cause

The cause of the tripping of the 1B Charger is not known. Potential causes are the cabinet temperature switch or the high voltage shutdown relay. Both devices were checked and the setpoints were within calibration. Normal operating temperatures of the cabinet are well below the temperature setpoint. No indications of high voltage were noted.

The failure of the 1A Charger was due to the drift of the K-3 relay setpoint, which controls the high DC voltage trip, combined with inadequate preventive maintenance. During the investigation of the charger trip, it was determined that the float voltage adjustment potentiometers were dirty, resulting in a slight DC ground. This reduced voltage to the voltage control circuit thereby causing the charger to increase output voltage to compensate. Further investigation revealed the trip setpoint of the K-3 relay to be approximately 272 V DC, just above the nominal operating voltage of 270 V DC. The setpoint should have been at approximately 286 V DC. Thus, it is probable that the charger voltage could have reached the as-found relay setpoint. The cause of the setpoint drift has not been determined, although two previous failures of this board have occurred. NPRDS also indicates several failures of this relay within the industry. Although a preventive maintenance activity exists for the charger, it did not explicitly cover the cleaning of items such as potentiometers. Cleaning of the potentiometers is not specified as a preventive maintenance action in the Vendor Manual. The relay setpoint for all chargers was checked during the Fall, 1991 outage.

LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 500 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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TEXT (if more space is required, use additional NRC Form 306A's) (17)

E. Safety Significance

As indicated above, the 1C charger had been placed in service supplying the 1B Battery shortly after the 1B Battery was declared inoperable. Because cables for the chargers are located in a common area, Appendix R considerations had initially dictated that the 1C Charger not be considered a qualified backup to the 1B Charger. Other than the power supply cables, the 1C Charger is fully qualified to replace the 1B Charger. With the 1C Charger in service, the 1B Battery was kept in a fully charged state and was capable of providing its design function, although not declared operable.

F. Safety Implications

The 250 Volt batteries supply power to station emergency equipment and selected safeguard system loads. Both batteries supply power to equipment in their respective train. The A Battery also supplies RCIC equipment, and the B Battery supplies High Pressure Coolant Injection equipment. Sufficient redundancy is provided to assure that the loss of either battery will not result in the inability to effectively respond to accident conditions.

G. Corrective Action

During the troubleshooting of the 1B Charger, the Voltage Error Detector and Current Sensor printed circuit board was found to be failed. The reason for the failure of the board is unknown. The failure of the board would not have caused the tripping of the charger without initiating Control Room annunciation. This board had been in service since December, 1991. The board was replaced, the firing cards were balanced, the current limit setting was adjusted, and other operating parameters were verified. Post maintenance testing of the charger was conducted to verify operability.

On the 1A Charger, the K-3 relay was replaced and calibrated. The potentiometers and printed circuit cards were cleaned, and post maintenance testing conducted to verify correct operation.

The preventive maintenance activity for the chargers will be enhanced to provide additional instructions on cleaning and maintenance of the chargers. Additional investigation will be conducted into the failure rate of the K-3 relay.

An Appendix R review had been previously started to determine the actions required to allow the 1C Charger to be considered a qualified backup to the 1B Charger, but this action had not been completed at the time of this event, and thus the necessary procedure changes had not been processed. The review was completed and the necessary procedure changes were approved on April 8 to fully qualify the 1C Charger.



LICENSEE EVENT REPORT (LER)  
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (F-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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TEXT (If it is a minor or required, use additional NRC Form 386A's) (17)

H. Similar Events

None

Supplemental Information

The 250 Volt Chargers are manufactured by C&D Power Systems, Model ARR260K200P. Part numbers for the failed components are:

K-3 Relay MBC-2920-260B-E

Printed Circuit Board MBC-1970-1-E