Nebraska Public Power District

COOPER NUCLEAR STATION
P.O. BOX 98, BROWNVILLE, NEBRASKA 68321
TELEPHONE (402) 825-3811

NLS950037

January 26, 1995

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

Dear Sir:

Cooper Nuclear Station Licensee Event Report 94-009, Supplement 1 is forwarded as an attachment to this letter.

Sincerely,

J. T. Herron
Plant Manager

/nr

Attachment

cc: L. J. Callan
G. R. Horn
J. H. Mueller
R. G. Jones
R. A. Sessoms
K. C. Walden
INPO Records Center
NRC Resident Inspector
R. J. Singer
CNS Training
CNS Quality Assurance
R. L. Koch



IE22

NRC FORM 366 (5-92) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

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.

# LICENSEE EVENT REPORT (LER)

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

| FACILITY NAME (1) | DOCKET NUMBER (2) | PAGE (3) |
|---|---|---|
| COOPER NUCLEAR STATION | 05000298 | 1 OF 6 |

TITLE (4) Inadequate load shed and logic system surveillance testing resulting in inoperability of safety systems.

| 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 | 25 | 94 | 94 | --009-- | 01 | 01 | 26 | 95 | FACILITY NAME | DOCKET NUMBER |

| OPERATING MODE (9) | N |
|---|---|
| POWER LEVEL (10) | 100 |

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) |
| | 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) | | OTHER |
| | 20.405(a)(1)(iii) | X | 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) | | |

LICENSEE CONTACT FOR THIS LER (12)

| NAME | TELEPHONE NUMBER (Include Area Code) |
|---|---|
| Alan J. Horn Staff Support Engineer, Nuclear Licensing and Safety | (402) 825-3811 |

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 |
|---|---|---|---|---|---|---|---|---|---|---|
| E | EC | BKR | W120 | Y | | | | | | |
| | | | | | | | | | | |

| SUPPLEMENTAL REPORT EXPECTED (14) | | | EXPECTED SUBMISSION DATE (15) | MONTH | DAY | YEAR |
|---|---|---|---|---|---|---|
| | YES (If yes, complete EXPECTED SUBMISSION DATE). | X NO | | | | |


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

On May 16, 1994, a tie wrap was discovered on the undervoltage trip device for the 480 VAC feeder breaker for MCC-N. This breaker is designed to trip during a loss of offsite power, which the tie wrap prevented. On May 23, additional investigation determined that the load shedding of other MCCs was not verified during surveillance testing. On May 25 it was determined that there were additional 480 VAC loads which were not procedurally verified to load shed (the Station Air Compressors and Control Rod Drive pumps). At 1:14 pm, both DGs were declared inoperable due to inadequate surveillance testing and a Notification of Unusual Event was declared. The continuing investigation into this condition also revealed that contacts in the 4160 VAC load shedding circuits of the Service Water Booster Pumps were not tested. A plant shutdown was subsequently commenced. Subsequent investigations determined that there were contacts in additional systems which were not tested in accordance with Technical Specification requirements for Logic System Functional Testing.

This revision is being submitted to provide the cause of this condition and the corrective actions taken and planned.

The cause of these conditions is attributable to a Management/Quality Assurance Deficiency (NUREG-1022, Cause code E) due to inadequate management expectations for configuration control, inadequate management commitment to the operating experience review program, and inadequate organization and programmatic controls.

Corrective actions include revising surveillance procedures, completion of required testing, modifying load shed trip devices, and organizational and programmatic changes.

A. Plant Status

At the time of initial discovery the plant was in operation at approximately 100 percent power. During most of the investigations and subsequent findings, the plant was in cold shutdown with the reactor coolant temperature approximately 110 degrees Fahrenheit.

B. Event Description

On May 16, 1994, while verifying fuse configurations of the safety related 480 VAC busses (EIIS:ED), a tie wrap was found on the undervoltage trip device for the feeder breaker (EIIS:BKR) for MCC-N. The tie wrap prevented the undervoltage trip device from functioning which would prevent the breaker from tripping during a loss of offsite power. An evaluation of the effect of the failure of this undervoltage trip device on Diesel Generator (DG) (EIIS:EK) operability indicated that although the tie wrap would prevent the breaker from tripping during conditions requiring a load shed, it would not result in exceeding the Diesel Generator design capability. Inspections of similar 480 VAC breakers were completed on May 17, with no other restraining devices found. On May 23, further investigation determined that the load shedding of the non-safety MCCs was not verified during surveillance testing. A review of computer records indicated that five breakers which feed non-safety related loads tripped during performance of the surveillance, but there was no indication that the feeder breaker for MCC-N tripped and no indication that the feeder breakers for MCC-OG1 and MCC-MR tripped. The operability of DG 1, assuming both MCC-N and MCC-OG1 did not load shed, and DG 2, assuming MCC-MR did not load shed, was reviewed on May 24. It was concluded that even with these conditions the resulting load would not exceed the design capability of the DGs.

On May 25 there were additional 480 VAC loads found which were not verified to load shed (the station air compressors (EIIS:CMP) and Control Rod Drive pumps (EIIS:P), which were routinely transferred to another bus during this surveillance test). At 1:14 pm, both DGs were declared inoperable due to the inadequate surveillance testing and a Notification of Unusual Event was declared. In accordance with Technical Specification requirements, a load reduction to 25 percent power was initiated. Continued investigation revealed that a contact in the 4160 VAC (EIIS:EB) load shedding circuit of the Service Water Booster Pumps (EIIS:P) was bypassed during load shed testing. A plant shutdown was subsequently initiated when it became evident from the investigation that operability of the DGs could not be assured. Cold shutdown was reached at 11:57 pm on May 26.

B. Event Description (cont'd)

During subsequent testing to demonstrate load shedding of components not previously tested, the feeder breakers for MCC-OG1 and MCC-MR did not trip and breakers for the Station Air Compressor A and MCC-V exceeded the required time to trip. Investigation into these failures revealed the undervoltage trip devices did not work properly. It was determined that the undervoltage trip devices should be replaced with shunt trip devices activated by undervoltage relays in the 4160 VAC system. These breakers are Westinghouse model DB-50s which have been the subject of previous generic information. Problems with the undervoltage trip devices were not identified earlier due to inadequate surveillance procedures which did not properly test them.

After plant shutdown, it was determined that the Technical Specification requirement for Logic System Functional Testing (LSFT) was not fully satisfied. A review of the systems required to be operable during shutdown resulted in declaring the Service Water System (EIIS:BI), Reactor Equipment Cooling System (EIIS:CC), 4160 VAC bus 1F, and 4160 VAC bus 1G inoperable on June 11. Additional reviews of LSFT requirements for a sample of other systems have identified contacts that had not been adequately tested. The contacts identified in this sample have been tested satisfactorily. It was also determined that additional contact testing should be completed for contacts that perform or initiate an automatic safety function.

The effort to resolve LSFT deficiencies resulted in identifying a subsequent inadequacy in some relay tests. The issue involved two 4160 VAC loss of voltage relays that were tested by an existing surveillance procedure, but the testing was determined to not fully satisfy the Technical Specification definition of an instrument functional test since it did not specifically test that the associated auxiliary relay was energized. This test was revised to provide the proper functional test and satisfactorily performed.

On July 21, 1994, upon completion of the investigation and testing associated with the 480 VAC circuit breakers, load shedding, sequential loading, and Logic System Functional Testing, DG 1 was declared operable and the Notice of Unusual Event was terminated. DG 2 was declared operable on July 24, 1994.

C. Cause

The cause of these conditions is due to inadequate management expectations for configuration control of equipment prior to testing, inadequate management commitment to the operating experience review program, and inadequate organization and programmatic controls. (NUREG-1022, Cause code E, Management/Quality Assurance Deficiency). These deficiencies all contributed to an overall culture at CNS that resulted in a narrow focus when resolving problems or generic issues which did not fully correct past deficient conditions at the plant.

The following are more specific discussions of the reasons behind the root cause:

The existence of the tie wrap was due to a procedure deficiency that installed the tie wrap as part of a test procedure, but did not require or verify the removal of the tie wrap upon completion of the test. Also, work control procedures did not provide adequate post-maintenance testing instructions that could have discovered this deficiency prior to returning the equipment to service.

The surveillance procedure for testing the sequential loading of emergency diesel generators did not verify the load shedding of the non-essential 480 VAC circuit breakers on bus 1F and 1G nor of the loads requiring load shedding on essential 480 VAC MCCs. This was partly influenced by evaluations indicating that even without load shedding of 480 VAC breakers the diesels will start and energize safety related loads without overloading.

The evaluation of Information Notice 88-83, "Inadequate Testing of Relay Contacts in Safety Related Logic Systems," identified contacts which were not being tested, but was closed without changes after concluding that the Technical Specifications were being met without the need for changes. In addition, the review of Information Notice 93-38, "Inadequate Testing of Engineered Safety Features Actuation Systems," had not been completed when this event was evaluated possibly indicating inadequate management commitment to the operating experience review program that existed at that time.

The failure of four of twelve 480 VAC circuit breakers to load shed in the required time was the result of unreliable undervoltage trip devices. These breakers, Westinghouse DB-50s, had been the subject of generic correspondence on several previous occasions, including NRC Bulletins 83-01, 83-04, 83-08, and 85-02. The recommendations in these bulletins were not adequately implemented.

D. Safety Significance

Calculations indicate that upon a loss of offsite power the diesel generators would have been capable of loading successfully even with the failure of all 480 VAC breaker undervoltage devices which shed loads from the emergency buses. Therefore, the DGs are considered to have been capable of performing their required function.

All of the logic system contacts tested were found to operate as required. Therefore, there is reasonable assurance that there would have been no impact on operability of the involved systems during previous power operation.

F. Corrective Action

Short term corrective actions have been completed to address significant concerns resulting from the events as described. These include the following.

1. The tie wrap was removed from the breaker and other breakers were inspected to ensure there are no other tie wraps or impairments of any kind.

2. The breakers required to load shed were identified and tested.

3. Breakers that did not satisfy load shed testing requirements resulted in removing the 480 VAC breaker undervoltage devices and replacing them with shunt trip devices. Subsequent load shed testing was satisfactory.

4. A review for contacts requiring testing in systems important to safety was completed.

5. Testing was performed on all startup related contacts found not to be properly tested during the above review.

6. A review of procedures was performed to assure proper restoration of components following maintenance or testing, including removal of any impairments.

7. A comprehensive review was performed to examine methods and procedures used in developing and implementing the surveillance program and to evaluate the program's efficiency, effectiveness and compliance with applicable regulations. Improvements to the surveillance program will be initiated based on recommendations from this evaluation.

E. Corrective Action (cont'd)

8. A review was performed of design input and output documents that did not include adequate configuration maintenance provisions. Issues developed during this review will be addressed by the Corrective Action Program.

Additional actions planned include the following.

A. Implement provisions to ensure that changes to procedures and engineering program documents are reviewed for impact on design basis documents. Interim measures have been implemented to monitor changes.

B. Perform a review and implement improvements in the Operating Experience Review Program to assure timely and complete OE reviews. This action is part of the CNS Performance Improvement Plan.

Management performance issues are being addressed in great part by changes in management staff, communicating management expectations, and requiring an increased level of accountability. The District has acquired new personnel with higher standards and reassigned some incumbent managers, which has brought a fresh industry perspective to Cooper Nuclear Station. A new Site Manager, Plant Manager, Operations Manager, Plant Engineering Manager, Licensing Manager, Planning and Scheduling Manager, and Corrective Action Program Manager have been acquired and have assumed their respective responsibilities. Other changes have been made and continue to be made in the way CNS carries out its responsibilities.

F. Similar Events

Inadequate surveillance testing has been the subject of the following LERs:

LER 93-011, Secondary Containment Surveillance Methodology Failed to Identify Leakage Path between Secondary Containment and the Radwaste Building.

LER 93-019, Nonconservative Testing Methodology Discovered During Local leak rate testing.

LER 93-027, ASME Section XI inspection and test requirements associated with safety-related portions of the Service Water and Reactor Equipment Cooling Systems.

G. Supplemental Information

Manufacturer: The breakers are Westinghouse Model DB-50.

Correspondence No: NLS9500037

The following table identifies those actions committed to by the District in this document. Any other actions discussed in the submittal represent intended or planned actions by the District. They are described to the NRC for the NRC's information and are not regulatory commitments. Please notify the Licensing Manager at Cooper Nuclear Station of any questions regarding this document or any associated regulatory commitments.

| COMMITMENT | COMMITTED DATE OR OUTAGE |
|---|---|
| Implement provisions to ensure that changes to procedures and engineering program documents are reviewed for impact on design basis documents. | N/A |
| Perform a review and implement improvements in the Operating Experience Review Program to assure timely and complete OE reviews. This action is part of the CNS Performance Improvement Plan. | N/A |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |