

## LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)

Catawba Nuclear Station, Unit 1

DOCKET NUMBER (2)

0 5 0 0 0 4 1 1 3

PAGE (3)

1 OF 05

TITLE (4)

Comparison of Digital Rod Position to Demand Rod Position Not Performed

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 | DOCKET NUMBER(S) |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-------|-----|------|------|-------------------|-----------------|-------|-----|------|----------------|------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0     | 9   | 2    | 4    | 8                 | 5               | 8     | 5   | 0    | 5              | 7                | 0 | 0 | 1 | 0 | 2 | 5 | 8 | 5 | 0 | 5 | 0 | 0 | 0 |

OPERATING MODE (9)

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

|                  |                   |                  |                      |  |
|------------------|-------------------|------------------|----------------------|--|
| 1                | 20.402(b)         | 20.406(c)        | 50.73(a)(2)(iv)      | 73.71(b)   |
| POWER LEVEL (10) | 20.406(a)(1)(i)   | 50.38(c)(1)      | 50.73(a)(2)(v)       | 73.71(c)   |
| 11010            | 20.406(a)(1)(ii)  | 50.38(c)(2)      | 50.73(a)(2)(vii)     | OTHER (Specify in Abstract below and in Text, NRC Form 366A) |
|                  | 20.406(a)(1)(iii) | X 50.73(a)(2)(i) | 50.73(a)(2)(viii)(A) |  |
|                  | 20.406(a)(1)(iv)  | 50.73(a)(2)(ii)  | 50.73(a)(2)(viii)(B) |  |
|                  | 20.406(a)(1)(v)   | 50.73(a)(2)(iii) | 50.73(a)(2)(ix)      |  |

LICENSEE CONTACT FOR THIS LER (12)

| NAME   | TELEPHONE NUMBER      |
|--|-----------------------|
| Roger W. Ouellette, Associate Engineer - Licensing | 71014 317131-17151310 |

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 |
|-------|--------|-----------|--------------|-------------------|-------|--------|-----------|--------------|-------------------|
|       |        |           |              |                   |       |        |           |              |                   |
|       |        |           |              |                   |       |        |           |              |                   |
|       |        |           |              |                   |       |        |           |              |                   |

SUPPLEMENTAL REPORT EXPECTED (14)

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

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

From September 24, 1985, at 1230 hours, to September 25, 1985, at 1000 hours, with the rod position deviation monitor inoperable, the demand position indication and the digital rod position indication were not compared at least once per 4 hours as required by Technical Specifications. This comparison is to ensure that the digital rod position indication for all control rods is within  $\pm 12$  steps of the demand position indication. This incident was discovered during a review of the Unit 1 Computer Alarm Summary. Upon discovery of this incident, a comparison of demand position to digital rod position was made as required by Technical Specifications. Catawba Unit 1 was at 100% power at the time of this incident.

This incident is classified as a Component Malfunction and a Personnel Error. When the PDC Controller 2000 failed, it masked the ability of the Control Room personnel to detect the alarms indicating that the Rod Position Deviation Monitor was inoperable due to the generation of erroneous computer alarms. However, the Control Room personnel should have determined the validity of incoming alarms and taken the appropriate corrective actions.

This incident is reportable pursuant to 10 CFR 50.73, Section (a)(2)(i)(B).

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## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

APPROVED OMB NO. 3150-0104

EXPIRES: 8/31/85

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|                                 |                   | YEAR           | SEQUENTIAL NUMBER | REVISION NUMBER |          |    |     |
| Catawba Nuclear Station, Unit 1 | 0 5 0 0 0 4 1 3   | 8 5            | - 0 5 7           | - 0 0           | 0 2      | OF | 0 5 |

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

Rod position monitoring of the full length control rods is provided by two separate systems which sense and display control rod position. The Digital Rod Position Indication System measures and provides control room indication for the actual position of each full length control rod. The Demand Position System counts pulses generated in the rod drive control system to provide digital readout of the demanded bank position. Each Digital Rod Position Indicator is demonstrated operable every 12 hours by verifying that the Demand Position Indication and the Digital Rod Position Indication agree within 12 steps. This is verified by procedure PT/1/A/4600/02, Mode 1 Periodic Surveillance Items, and is required by Technical Specification 4.1.3.2.

The demanded and measured rod position signals are monitored by the Operator Aid Computer (OAC) which provides a visual printout and an audible alarm if an individual rod position deviates from the bank demand position by more than 12 steps. This function of the OAC is known as the Rod Position Deviation Monitor. In the event the Rod Position Deviation Monitor is inoperable, procedure PT/1/A/4600/09, Loss of Operator Aid Computer, is implemented. PT/1/A/4600/09 is used every 4 hours to verify that the Digital Rod Position Indication and the Demand Position Indication agree within 12 steps. This verification is required by Technical Specification 4.1.3.2.

On September 24, 1985, at 1102:03 hours, a "PDC Controller 2000" alarm was received on the OAC. This alarm intermittently actuated and deactuated throughout the day. The failure of the PDC Controller 2000 resulted in no audible OAC alarms, the loss of megawatt input to the OAC, and the loss of OAC keyboard lights. A Priority 2 Work Request was subsequently issued to investigate and repair the OAC PDC Controller 2000.

The OAC received and printed out certain transformer alarms several times during the day. At 1230:46 hours, the "Rod Position Interface Failed" OAC alarm was received, and at 1231:10 hours, the "Rod Position Hardware Malfunction" OAC alarm was received. However, these two alarms went undetected by Control Room personnel.

On September 25, 1985, at about 1000 hours, during a review of the Unit 1 Computer Alarm Summary, it was discovered that the "Rod Position Interface Failed", and "Control Rod Position Hardware Malfunction" OAC alarms had been received. Normally the Alarm Summary Review is performed during shift turnover, but due to the workload at the time, it was performed later. PT/1/A/4600/09 was initiated after the Rod Position Deviation Monitor was determined to be inoperable. A Priority 2X Work Request was subsequently issued to investigate and repair the cause of the "Rod Position Interface" and the "Control Rod Position Hardware Malfunction" OAC alarms. At 1115 hours, the Rod Position Deviation Monitor was declared inoperable.

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| Catawba Nuclear Station, Unit 1 | 0 5 0 0 0 4 1 3 8 5 | —              | 0 5 7             | —               | 0 0      | 0 3 | OF 0 5 |

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

When the "Rod Position Interface Failed" and the "Rod Position Hardware Malfunction" OAC alarms were received, the Rod Position Deviation Monitor became inoperable. This resulted in the inability of the OAC to compare measured rod position to demanded rod position. At the time the alarms occurred, PT/1/A/4600/09 should have been implemented to satisfy the surveillance requirements specified in Technical Specification 4.1.3.2. However, the presence of the "Rod Position Interface Failed", and the "Rod Position Hardware Malfunction" OAC alarms went undetected by Control Room personnel. At the time these two alarms occurred, there were no audible OAC alarms due to the failure of the PDC Controller 2000. Also, the OAC had received certain erroneous transformer alarms several times during the day. These conditions contributed to the fact that the alarms went undetected. For this reason an event cause of Component Malfunction is assigned to this incident.

At the time the "Rod Position Interface Failed", and the "Rod Position Hardware Malfunction" OAC alarms were received, the Control Room personnel should have determined the validity of the incoming alarms before acknowledgement and taken the appropriate corrective actions. Also, Operations Management Procedure (OMP) 2-22 requires that the oncoming and off-going Unit Supervisor, Operator at the Controls, and Balance of Plant Operator review the Alarm Summary during shift turnover. When this review was performed, the significance of each alarm present should have been clearly understood so as to determine its impact on station operation. Therefore, this incident is also classified as a Personnel Error.

On September 26, 1985, personnel attempted to investigate and repair the OAC PDC Controller 2000. However, Operations did not want to bring the OAC down, so the work was rescheduled for September 27, 1985. On that day, 13 circuit cards in the OAC PDC Controller 2000 were replaced. Personnel inspected each card which was replaced. However, no visible problem could be identified. At this time, the specific cause of the PDC Controller 2000 failure and the "Rod Position Interface Failed", and the "Rod Position Hardware Malfunction" OAC alarms is not known. However replacement of the circuit cards corrected the problem. The PDC Controller 2000 is a subsystem of the Honeywell Model 4400 computer. A review of the Nuclear Plant Reliability Data System did not reveal any failures associated with this type equipment.

Work Requests were issued on September 24, 1985, and September 25, 1985, respectively. The repair work was completed and the PDC Controller was returned to service on September 27, 1985.

## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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| Catawba Nuclear Station, Unit 1 | 0   5   0   0   0   4   1   3 | 8   5          | —   0   5   7     | —   0   0       | 0   4    | OF | 0   5 |

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

Indication of inoperable rod position monitoring by the OAC is provided by the following digital alarm points:

- D4397 - "OAC Rod Position Interface"
- D4398 - "Digital Rod Position Interrupt Status Malfunction"
- D4406 - "Rod Bank Position Hardware Malfunction"
- D4407 - "Control Rod Position Hardware Malfunction"
- D4408 - "Control Rods Position Reliable"

When any of these points go into alarm, the capability of the OAC to monitor rod position is lost and may indicate that the Rod Position Deviation Monitor is inoperable. However, due to the alarm descriptions provided for each of these alarms, it is not clear to the Control Room Operator that the Rod Position Deviation Monitor is inoperable. For this reason, a change request was issued to have the OAC software changed to provide a "Technical Specification Rod Position Deviation Monitor Inoperable" alarm and invalidate the Performance alarm points indicating maximum Technical Specification Rod Deviation when the above digital alarm points go into alarm. Had the capability to invalidate the Performance alarm points been available at the time of the incident, the inoperable Rod Position Deviation Monitor would have been discovered during the conduct of PT/1/A/4600/02A on September 24, 1985, at 1545 hours which would have been within the 4 hour Technical Specification requirement.

CORRECTIVE ACTION

- 1) PT/1/A/4600/09 was initiated and measured rod position was verified to be within 12 steps of demand rod position every 4 hours.
- 2) Personnel replaced 13 circuit cards in the OAC PDC Controller 2000.
- 3) An Operator Update was issued to stress the importance of understanding and acknowledging all OAC alarms received in the Control Room.
- 4) A change request was issued to have the OAC software changed to provide a "Technical Specification Rod Position Deviation Monitor Inoperable" alarm and invalidate the Performance alarm points indicating maximum Technical Specification rod deviation when the OAC alarm points for rod position monitoring go into alarm.
- 5) A change was made to the Computer Response Manual to direct Control Room personnel to initiate PT/1/A/4600/09, Loss of Operator Aid Computer, to ensure Demand Rod Position is compared to Digital Rod Position as required by Technical Specifications when the aforementioned digital alarm points are in alarm.

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| Catawba Nuclear Station, Unit 1 | 0 5 0 0 0 4 1 3 8 5 | —              | 0 5 7             | —               | 0 0      | 0 5 | OF 0 5 |

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

SAFETY ANALYSIS

The Rod Position Deviation Monitor became inoperable on September 24, 1985 at 1330 hours. At 1545 hours, Operations verified per PT/1/A/4600/02A that the rod position indication and the demand position indication agreed within 12 steps. This comparison was made again on September 25, 1985, at 0305 hours. The inoperability of the Rod Position Deviation Monitor was discovered at 1000 hours on September 25, 1985 and PT/1/A/4600/09 was implemented at that time. Therefore measured rod position verses demand position was being monitored by Control Room personnel, although not at the required Technical Specification surveillance interval, and was determined to agree within 12 steps. Also, from a comparison made between measured rod position as recorded in the Control Room Log and demand rod position as recorded in the NSSS Log, measured rod position was within 12 steps of demand rod position at 1900 hours, on September 24, 1985, and 0700 hours, on September 25, 1985.

The health and safety of the public was not affected by this incident.

DUKE POWER COMPANY

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VICE PRESIDENT  
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October 25, 1985

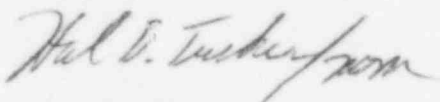
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U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Subject: Catawba Nuclear Station, Unit 1  
Docket No. 50-413

Gentlemen:

Pursuant to 10 CFR 50.73 Section (a) (1) and (d), attached is Licensee Event Report 413/85-57 concerning the comparison of Digital Rod Position to Demand Rod Position not being performed as required. This event was considered to be of no significance with respect to the health and safety of the public.

Very truly yours,



Hal B. Tucker

RWO:slb

Attachment

cc: Dr. J. Nelson Grace, Regional Administrator  
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