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March 24, 1994

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

Subject: Catawba Nuclear Station
Docket No. 50-413
LER 413/94-003

Gentlemen:

Attached is Licensee Event Report 413/94-003 concerning MISSED TECHNICAL SPECIFICATION 3.3.1 ACTION STATEMENT.

This event was considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

Mark E. Patrick for

D. L. Rehn

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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) |
|---|---|---|
| Catawba Nuclear Station, Unit 1 | 05000413 | 1 OF 06 |

TITLE (4)
Missed Technical Specification 3.3.1 Action Statement

| 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 |
| 02 | 22 | 94 | 94 | -- 003 -- | 00 | 03 | 24 | 94 | CNS, Unit 2 | 05000414 |
| | | | | | | | | | FACILITY NAME | DOCKET NUMBER 05000 |

| OPERATING MODE (9) | 1 |
|---|---|
| POWER LEVEL (10) | 97 |

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) | X 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) | 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) |
|---|---|
| Z. L. Taylor, Compliance Manager | (803) 831-3812 |

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) | | | 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 February 22, 1994, with Units 1 and 2 in Mode 1, Power Operation, at 97% and 50% power level respectively, Safety Assurance determined that Technical Specification (T/S) 3.3.1, Table 3.3-1, Action Statement violations had occurred. A review of Excore Nuclear Instrumentation (ENB) System (NIS) Power Range channel calibration/testing documentation indicated instances in which a channel of the Over Power Delta Temperature (OPDT) reactor trip function was inoperable for greater than 6 hours without its associated OPDT bistable being placed in the tripped position as required by T/S. T/S Amendments 101/95 and 107/101 included adding current (neutron flux) differential (Delta-I) from the NIS Power Range instrumentation to the OPDT reactor trip function. This change resulted in a channel of the OPDT reactor trip function being inoperable during NIS Power Range channel calibration/testing. Per T/S, the inoperable channel must be placed in the tripped position within 6 hours. Procedures were not updated to ensure that the affected OPDT reactor trip function bistable was placed in the tripped position during NIS Power Range channel calibration/testing. This event is attributed to Change Management due to change related documents not being revised. Corrective action includes revisions to Operations and Instrument and Electrical (IAE) procedures, a revision to the T/S interpretation of Reactor Trip System instrumentation, and a review of Catawba Site Directive 2.1.7, T/S Amendments, to determine if enhancements associated with the review of documents associated with T/S changes are warranted.

BACKGROUND

The purpose of the Excore Nuclear Instrumentation [EIIS:JG] (ENB) System (NIS) is to protect the reactor [EIIS:VSL] core by monitoring neutron flux and generating appropriate alarms and trips during all power levels from shutdown to full power operation. There are three overlapping ranges of NIS; Source Range, Intermediate Range, and Power Range.

Power Range instrumentation consists of four independent channels per unit designated as N-41, N-42, N-43, and N-44. Two detectors [EIIS:XT] are provided per channel (upper and lower).

On September 14, 1992, the Nuclear Regulatory Commission (NRC) approved Amendment 101 to Facility Operating License NPF-35 and Amendment 95 to Facility Operating License NPF-52 (Docket Numbers 50-413 and 50-414). This change was to revise the T/S to reflect the reloading of Unit 1, Cycle 7, with fuel manufactured by the Babcock and Wilcox (B&W) Fuel Company. T/S 2.2.1, Reactor Trip System Instrumentation Setpoints, Table 2.2-1, was changed to include electrical current differential (Delta-I) from NIS Power Range instrumentation as an input to the Over Power Delta Temperature (OPDT) reactor trip function for Unit 1. This input (F2-Delta-I) is a function of the indicated electrical current differential between the upper and lower detectors of the power range neutron ion chambers.

On March 23, 1993, the NRC approved Amendment 107 to Facility Operating License NPF-35 and Amendment 101 to Facility Operating License NPF-52. This T/S revision was associated with the reloading of Unit 2, Cycle 6, with B&W fuel. T/S 2.2.1, Table 2.2-1, was revised to include electrical current differential from the Power Range upper and lower detectors as an input to the OPDT reactor trip function for Unit 2.

The OPDT reactor trip function provides assurance of fuel integrity (e.g., no fuel pellet melting and less than 1 percent cladding strain) under all possible overpower conditions, limits the required range for Overtemperature Delta Temperature reactor trip function, and provides a backup to the High Neutron Flux reactor trip function.

T/S 3.3.1, Reactor Trip System Instrumentation, requires a minimum of three operable OPDT channels in Mode 1, Power Operation, and Mode 2, Startup. Action Statement 6 to Table 3.3-1 states the following:

> With the number of OPERABLE channels one less than the Total Number of Channels, STARTUP and/or POWER OPERATION may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within 6 hours, and

b. The Minimum Channels OPERABLE requirement is met; however, the inoperable channel may be bypassed for up to 4 hours for surveillance testing of other channels per Specification 4.3.1.1.

Procedures IP/1(2)/A/3240/04C, NIS Power Range Channel Calibration, are used to perform NIS 18 month channel calibrations as required by T/S Surveillance Requirement 4.3.1.1.

Procedures IP/1(2)/A/3240/14 are used to perform NIS Incore/Excore cross calibrations on the respective Units.

Procedures AP/1(2)/A/5500/16, Malfunction of Nuclear Instrumentation System, are used by the Control Room Operators to verify the proper response in the event of a nuclear instrumentation malfunction.

Catawba Site Directive 2.1.7, T/S Amendments, provides guidance for the review and implementation of T/S changes. Guidance is provided on the method to notify affected groups to review proposed T/S changes, identify and prepare affected documents for revision upon implementation of the T/S change, and final notification to implement document changes upon T/S change implementation.

EVENT DESCRIPTION

On January 8, 1994, with Unit 1 in Mode 1, Power Operation, at 100% power level, Instrument and Electrical (IAE) technicians were performing procedure IP/1/A/3240/14 on NIS Power Range channel N41 per Work Order Task 93093141 01.

During the performance of the calibration, the bistable [EIIS:XIS] for Loop A OPDT tripped and the setpoint meter failed low. This was an unexpected response. The Control Room Operators consulted procedure AP/1/A/5500/16. The procedure did not specify to trip the OPDT bistable on the malfunction of a Power Range channel.

Component Engineering was contacted to explain the unexpected response. The Component Engineer explained that the alarm should be expected since Delta-I from the Power Range instrumentation is an input to the OPDT equation.

This event was documented in Problem Investigation Process (PIP) 0-C94-0024 for investigation into the root cause.

A review of IAE procedures associated with the NIS Power Range channels indicated that provisions for placing the OPDT bistables in the tripped position during calibrations/testing were not made following the T/S changes to include Delta-I into the OPDT reactor trip equation.

Since one channel of the OPDT reactor trip function was determined to be inoperable during Power Range NIS calibrations/testing, a review of NIS Power Range calibrations/testing was initiated to determine if any violations of Action Statement 6 to T/S Table 3.3-1 had occurred following implementation of T/S Amendments 101/95 and 107/101. The Technical Specification Action Item Logbook (TSAIL) was reviewed to determine the time period an OPDT channel was technically inoperable during NIS Power Range instrumentation calibrations/testing. On February 22, 1994, with Units 1 and 2 in Mode 1, a determination was made that there were 7 instances in which a channel of the OPDT reactor trip function was inoperable for greater that 6 hours without the bistable being placed in the tripped position.

CONCLUSION

One of the Catawba T/S changes associated with Amendments 101/95 and 107/101 added Delta-I input from the NIS Power Range instrumentation to the OPDT equation. Physical and procedural changes made to implement this change involved the NSSS Process Instrumentation and Control [EIIS:JF] (EIA) System (7300 Process Protection System) and Reactor Protection/Engineered Safety Features response time testing.

During the change review process, rendering a channel of the OPDT reactor trip function inoperable during NIS Power Range calibrations/testing was not identified. This resulted in the procedures associated with the NIS Power Range instrumentation not being revised to include the tripping of the affected channel of OPDT during NIS Power Range calibration/testing. This event is attributed to Change Management due to change related documents not being revised.

Corrective action included Operations revising AP/1(2)/A/5500/16 to ensure IAE places the affected OPDT bistable in the tripped position within the T/S Table 3.3-1 six hour time limit in the event a Power Range channel becomes inoperable.

Planned corrective actions include IAE revising NIS Power Range procedures to include placing the affected OPDT bistable in the tripped position during channel calibration/testing and Regulatory Compliance revising the T/S interpretation for T/S 3.3.1, Table 3.3-1, to include OPDT as an inoperable functional unit. Regulatory Compliance will also review Catawba Site Directive 2.1.7 to determine if enhancements concerning the review of documents associated with T/S changes are warranted.

2) Regulatory Compl... /S interpretatio
3.3-1, to include OPDT as an inop... functional unit

3) Regulatory Compliance will review Catawba Site Directi
enhancements concerning the review of documents assoc
are warranted.

A review of the PIP data base for the 24 month period preceding this event revealed one other reportable event attributed to Change Management. This event is documented in Licensee Event Report (LER) 413/94-002. This event involved missed T/S 3.3.1, Table 4.3-1, surveillance requirements for NIS Intermediate Range and Power Range instrumentation. The specific root cause and corrective actions from the previous event are not applicable to the current event.

A similar event is documented in LER 413/93-011 in that two Model Work Orders were not revised following a T/S amendment. The root cause of this event was attributed to document use practices due to notification requirements specified by Catawba Site Directive 2.1.7 not being fully implemented during this specific T/S amendment. Corrective action associated with LER 413/93-011 includes review of Catawba Site Directive 2.1.7 to determine if enhancements to strengthen control of the T/S change process are warranted. This review is associated with the notification of groups affected by a T/S change. In addition, a review of T/S amendments implemented in the previous two years will be performed to ensure affected documents were updated to reference any change. The specific root cause of the previous event is not applicable to the current event. The current event is not considered recurring.

CORRECTIVE ACTIONS

SUBSEQUENT

1) The Operations Group revised procedures AP/1(2)/A/5500/16 to ensure IAE places the affected OPDT bistable in the tripped position within the T/S Table 3.3-1 time requirements in the event a Power Range channel becomes inoperable.

PLANNED

1) IAE will revise the NIS Power Range calibration/testing procedures to include placing the affected OPDT bistable in the tripped position.

2) Regulatory Compliance will revise the T/S interpretation for T/S 3.3.1, Table 3.3-1, to include OPDT as an inoperable functional unit.

3) Regulatory Compliance will review Catawba Site Directive 2.1.7 to determine if enhancements concerning the review of documents associated with T/S changes are warranted.

## SAFETY ANALYSIS

The investigation into the cause of PIP 1-C94-0024 identified times during the operation of Catawba Unit 1 Cycle 7 (C1C07) and Unit 2 Cycle 6 (C2C06) when one channel of NIS was inoperable for providing a F2-Delta-I trip penalty. These times exceeded the Technical Specification requirement for placing an inoperable OPDT channel in the tripped position within 6 hours. The safety significance of these instances were reviewed relative to the function of the F2-Delta-I trip penalty.

The F2-Delta-I function may be used to provide both direct and indirect benefits during the safety analysis and operating limits determination of a cycle design. The penalty function may be used as a direct benefit to protect against Centerline Fuel Melt (CFM) limits at highly axially skewed power distributions. It may also be used as an indirect benefit to determine maximum achievable power levels in the safety analyses or to restrict the range of imbalance considered for evaluating fuel failure criteria (Departure from Nucleate Boiling, CFM, or Transient Strain).

In reviewing the safety significance of these events, both direct and indirect benefits of the F2-Delta-I penalty were evaluated. Evaluation of the benefits of the F2-Delta-I function included ensuring that no credit was taken in the safety analysis or in limiting the range of Axial Flux Difference evaluated in the Maneuvering Analyses or Transient Strain Evaluations.

Calculations performed by Nuclear Design and Reactor Support demonstrated that for the particular cycles of interest the Reactor Protection System trip systems would have adequately performed their intended function without a reduction in safety. This conclusion is applicable for the entire length of the cycle for C1C07 and C2C06.

The health and safety of the public were not affected by this event.