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DUKE POWER

May 22, 1995

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

Subject: Catawba Nuclear Station
Docket No. 50-414
LER 414/95-002

Gentlemen:

Attached is Licensee Event Report 414/95-002 concerning TECHNICAL SPECIFICATION 3.6.1.1 VIOLATION DUE TO WRITTEN COMMUNICATION.

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

Very truly yours,

D. L. Rehn

kas

Attachments

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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 2 | 05000414 | 1 OF 8 |

TITLE (4)
Technical Specification 3.6.1.1 Violation Due to Written Communication

| 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 |
| 04 | 20 | 95 | 95 | -- 002 -- | 00 | 05 | 22 | 95 | CNS, Unit 1 | 05000413 |
| | | | | | | | | | FACILITY NAME | DOCKET NUMBER |
| | | | | | | | | | | 05000 |

| OPERATING MODE (9) | 1 |
|---|---|
| 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) |
|---|---|
| D. P. Kimball, Safety Review Group Manager | (803)831-3743 |

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 April 20, 1995, with Units 1 and 2 in Mode 1, Power Operation, at 100 percent power, Safety Assurance determined that a reportable event involving Technical Specification 3.6.1.1, Containment Integrity, had occurred. During the investigation of a missed retest following calibration of a Containment Pressure Control System (CPCS) pressure transmitter, the Engineering group determined that containment integrity would not be ensured during calibrations involving containment pressure sensing transmitters. These procedures aligned an open path from containment to the Auxiliary Building and included the use of a valve for equipment isolation which is not part of the containment boundary, thus had not received Type C leak rate testing. This is attributed to Written Communication due to technical inaccuracies caused by the procedure preparer's/reviewer's lack of knowledge of the containment boundary relating to containment pressure sensing instrument penetrations and the requirements of 10CFR50, Appendix J. Planned corrective action includes the development of a controlling procedure to provide guidance during calibrations and testing associated with containment pressure sensing transmitters. This procedure will be an interim measure dependent on the successful completion of long term planned corrective actions which include the Type C leak rate testing of the manual isolation valve for each containment pressure transmitter, the addition of an isolation valve at the test tee for each containment pressure transmitter, and necessary procedure revisions associated with these corrective actions.

## REQUIRED NUMBER OF DIGITS/CHARACTERS FOR EACH BLOCK

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

## BACKGROUND

Containment pressure is sensed via four containment instrument penetrations [EIIS:PEN] per unit. These containment instrument penetrations are CNIP-1(2)NS9, 10, 11, and 12.

Each containment instrument penetration is provided an impulse line isolation solenoid valve [EIIS:PSV] which meets the requirements set forth in Regulatory Guideline 1.11, Instrument Lines Penetrating Primary Reactor Containment. The impulse line isolation solenoid valves are designated 1(2)NSSV0010, 1(2)NSSV0020, 1(2)NSSV0030, and 1(2)NSSV0040. These valves provide for containment isolation and are located as close to the outside penetrations of containment as practical. The solenoid valves are open during Mode 1 (Power Operation), Mode 2 (Startup), Mode 3 (Hot Standby), and Mode 4 (Hot Shutdown) and are energized by a Reactor Operator to close in the event of an impulse line break.

The containment boundary includes all piping and components downstream of these solenoid valves. Per the Post Maintenance Retest Manual, a Type C leak rate test is required following breach of this containment boundary.

The Containment Pressure Control System (CPCS) provides start/stop permissives to the Containment Spray (NS) System [EIIS:BE] and the Containment Air Return and Hydrogen Skimmer (VX) System [EIIS:BB] to preclude their operation below a containment pressure of 0.25 psig. This provision is provided per the requirements of Section 6.2.1.1.A.II.8 of NUREG 0800, Standard Review Plan (July 1981), to protect the containment structure against possible damage from external pressure conditions which may result, for example, from inadvertent operation of the containment heat removal systems.

Technical Specification 3.6.1.1 states that primary containment integrity shall be maintained. This requirement is applicable in Modes 1 through 4. The Action Statement states that without containment integrity, restore containment integrity within one hour or be in at least Hot Standby within the following six hours and in Cold Shutdown (Mode 5) within the following thirty hours.

Procedure IP/2/A/3145/04, Calibration Procedure for Containment Pressure Control System (CPCS), NS Subsystem, is used to calibrate the instrumentation in the Unit 2 CPCS System.

Periodic Test procedure PT/2/A/4200/01C, Containment Isolation Valve Leak Rate Test, is used for performance of leak rate testing for Unit 2 containment boundary.

## EVENT DESCRIPTION

March 30, 1995

1315 hours — Instrument and Electrical (IAE) began activities per Work Order 95026506-01 to repair CPCS channel 2 of B train. Pressure transmitter [EIIS:PT] 2NSPT5260 was reading low compared to other transmitters.

1800 hours — IAE completed transmitter calibrations for 2NSPT5260 per procedure IP/2/A/3145/04.

2140 hours — The Duty Single Point of Contact (SPOC) supervisor contacted the Duty Systems Engineer to determine if a Type C leak rate test per procedure PT/2/A/4200/01C was required. The SPOC supervisor indicated that 2NSPT5260 had been calibrated, but that the containment pressure boundary had not been breached. Based on this information the Type C Leak Rate Test was waived.

An Analog Channel Operational Test (ACOT) was performed per procedure IP/2/A/3145/01B as required by the Post Maintenance Manual for 2NSPT5260 and documented on Work Order 95027189-01.

March 31, 1995

0020 hours — Work Order 95026506-01 was signed as complete for pressure transmitter 2NSPT5260.

1150 hours — The Duty Systems Engineer discussed waiving the Type C leak rate test with the NS System Engineer. Per their conversation and resulting investigation, a determination was made that IAE had breached the system during the calibration of 2NSPT5260.

1330 hours — A Technical Specification Operability Notification was issued declaring the containment penetration (CNIP-2NS10) associated with pressure transmitter 2NSPT5260 inoperable. Applicable Technical Specification Action Item Logbook (TSAIL) entries were made to declare equipment associated with B Train of CPCS inoperable. Necessary actions to place the equipment in the tripped or bypassed condition were performed.

1415 hours — Operations closed solenoid valve 2NSSV0030 to isolate the containment penetration. The Operations Test Group began performance of the Type C leak rate test on the containment penetration (CNIP-2NS10).

1600 hours — The Type C leak rate test on the instrument penetration was successfully completed.

1720 hours — All equipment was restored to normal status. Containment instrument penetration CNIP-2NS10 was declared operable.

Problem Investigation Process (PIP) 2-C95-0506 was initiated to investigate the past operability of the containment instrument penetration following the missed retest.

CONCLUSION

During the investigation of past operability concerns, Systems Engineering determined that pressure transmitter calibrations per IP/2/A/3145/04 were technically inadequate in that containment integrity has not been ensured during the performance of calibrations.

The IAE group immediately reviewed all of their procedures used during calibrations and testing of containment instrument penetrations. Sixteen procedures (including IP/2/A/3145/04) were identified which are similarly written and have the possibility of affecting containment integrity during their performance. The following procedures were identified by this review:

- IP/1(2)/A/3145/04, Calibration Procedure for CPCS, NS Subsystem
- IP/1(2)/A/3145/05, Calibration Procedure for Containment Spray Wide Range Pressure
- IP/1(2)/A/3174/02, Calibration Procedure for Containment Air Release and Addition, VQ System [EIIS:BF]
- IP/1(2)/A/3200/03A, Reactor Protection/Engineered Safeguards Features Response Time Testing (Enclosures for NS transmitters)
- IP/1(2)/A/3222/47A, Containment Pressure Loop PT-937, Channel 1
- IP/1(2)/A/3222/47B, Containment Pressure Loop PT-936, Channel 2
- IP/1(2)/A/3222/47C, Containment Pressure Loop PT-935, Channel 3
- IP/1(2)/A/3222/47D, Containment Pressure Loop PT-934, Channel 4

Each of these procedures are associated with containment pressure sensing instrumentation. These procedures involve the closing of the manual isolation valve [EIIS:ISV] for a containment pressure transmitter during

calibrations or testing. This valve is not part of the containment pressure boundary and does not receive Type C leak rate testing. Thus, during the calibration and testing of pressure transmitters associated with the procedures listed above containment integrity can not be ensured.

During June of 1987, procedural changes were made to IP/1(2)/A/3145/04 and IP/1(2)/3145/05 which allowed for the opening of the manual isolation valve prior to removal of the test equipment. This change was performed to ensure that the manual isolation valve was open and not clogged. With the containment impulse line isolation solenoid valve for the containment instrument penetration open, a direct flow path from containment exists.

This event is attributed to Written Communication due to technical inaccuracies in procedures used to perform calibrations and testing of containment pressure sensing transmitters. During the original preparation and subsequent changes to these procedures containment integrity (T/S 3.6.1.1) was not referenced. Personnel involved with the preparation and review of these procedures did not have adequate knowledge of the makeup of the containment boundary on instrument penetrations utilized by containment pressure sensing transmitters or the requirements set forth in 10CFR50, Appendix J.

The procedural technical inaccuracies occurred prior to and during 1987. Review has indicated that these procedural technical inaccuracies are limited to the procedures associated with containment instrumentation penetrations which are used to sense containment pressure and can be attributed to the unique design of these penetrations.

The following corrective actions will be performed to ensure containment integrity during future calibrations utilizing these procedures:

- A procedure will be written to provide specific guidance for calibrations of pressure transmitters associated with this Licensee Event Report (LER) during Modes 1 through 4. This procedure will be cross-disciplinary reviewed by the appropriate Systems Engineer.

This controlling procedure will be an interim measure pending the successful completion of the following long term corrective actions:

- A station modification will be performed to add isolation valves at the test tees used for test equipment installation during calibrations. These isolation valves and the test tee caps will become a double barrier which is administratively controlled and exempt from Type B and C leak rate testing per ANSI 56.8 - 1994.

- The manual isolation valve for each pressure transmitter will receive a Type C Leak Rate test to determine if the valve can qualified for use for isolation purposes during future transmitter calibrations.

- Procedures associated with the calibration of pressure transmitters on containment instrument penetrations associated with this LER will be revised to include necessary changes due to the addition of the isolation valves at the pressure transmitter test tees following successful completion of the station modification noted above. Reference the IP procedures listed above. These procedure revisions will be cross-disciplinary reviewed by the appropriate Systems Engineer.

A procedure weakness was also identified in PT/1(2)/4200/01C. The test equipment used for pressurization during the Type C leak rate testing of containment instrument penetrations CNIP-1(2)NS9, 10, 11, and 12 are connected at the test tee on the high pressure side of containment pressure transmitters. Thus, the test tee cap does not receive a Type C leak rate test. Procedure changes will be made to perform this testing via the test tee located on the instrument loop drain line since a double barrier exists at this point.

A review of the Operating Experience Program database for the twenty four months prior to this event did not identify any reportable events associated with technical inaccuracies in written communications or events associated with containment integrity. This event is not considered recurring.

CORRECTIVE ACTIONS

SUBSEQUENT

1) Containment instrument penetration CNIP-2NS10 was successfully Type C LeakRate tested per procedure PT/2/A/4200/01C.

2) NS and VQ procedures used for calibration of containment pressure transmitters were placed on hold pending completion of the planned corrective actions.

PLANNED

1) A procedure will be written to provide specific guidance for calibrations of pressure transmitters associated with this LER during Modes 1 through 4. This procedure will receive cross-disciplinary review by the appropriate Systems Engineer. This corrective action will be used as an interim measure pending the successful completion of planned corrective actions 2 and 3.

2) A station modification will be performed to add isolation valves at the test tees used for test equipment installation during calibrations of containment pressure sensing transmitters.

3) The manual isolation valve for each pressure transmitter on instrument penetrations associated with this LER will be Type C leak rate tested to determine if the manual isolation valve can be qualified for use during future pressure transmitter calibrations.

4) Procedures associated with the calibration of containment pressure sensing transmitters associated with this LER will be revised to include necessary changes due to the addition of the isolation valve at the pressure transmitter test tee following the completion of the station modification noted in Planned Corrective Action number 2. These procedure revisions will receive cross-disciplinary review by the appropriate Systems Engineer.

5) Procedures PT/1(2)/A/4200/01C will be revised to perform Type C leak rate testing of containment instrument penetrations CNIP-1(2)NS9, 10, 11, and 12 via the test tee on the loop drain leg.

SAFETY ANALYSIS

In the event that a design basis accident had occurred during the calibration/testing of a containment pressure transmitter it is reasonable to expect that the IAE technicians would have taken appropriate measures to return the instrumentation to normal service which would have restored the integrity of this penetration. This is consistent with the requirements set forth in Site Directive 3.0.7, Site Assembly/Evacuation, which provides direction for returning equipment to a safe condition during an accident scenario.

With Emergency Core Cooling System (ECCS) available, no fuel damage would occur. Additionally, without ECCS the source term availability would be protracted in time such that early isolation of the instrumentation would prevent the release of unfiltered source term from containment. Duke Power Company computer codes have been used to demonstrate that, even without ECCS, significant source term releases would not begin until 15-20 minutes into an accident assuming no transfer of heat to the flashing coolant. Additionally, NUREG/CR-5747 summarizes the results of the Nuclear Regulatory Commission computer code package, STCP, to show that significant releases do not begin until approximately 28 minutes for the most limiting sequence.

The instrumentation in question does not communicate directly with the environment, but communicates with the Auxiliary Building. NUREG/CR-5928 outlines studies which demonstrate that a typical auxiliary building

will retain more that 75 percent of the fission products with no operator action. Dose calculations have been performed combining the dose results from realistic containment leakage (from Integrated Leak Rate Test results) and the leakage which would have existed through this instrumentation during a large break Loss of Coolant Accident (LBLOCA), using an Auxiliary Building decontamination factor (DF) suggested in NUREG/CR-5928. Both the Exclusion Area Boundary and the Low Population Zone dose results are below the 10 CFR 100 values.

The Catawba Probabilistic Risk Assessment (PRA) also evaluates both intact containment and containment failure sequences. The risk from intact containment sequences constitutes less than 0.03 percent of the risk of all initiators. The containment leak rate used in the Catawba PRA was the design leak rate. However, the small addition to the leak rate from this instrumentation would not cause a significant change in public risk. Also, the Catawba PRA assumes no credit for filtration of fission products for intact containment sequences. Therefore, if the leakage from the open penetration bypasses available filtration systems, the Catawba PRA still applies. In both the design basis dose analysis and the PRA assessment above, no credit was assumed for filtration of the leakage by the Auxiliary Building Ventilation (VA) System [EIIS:VF], which would be available post-accident. NUREG-1493 evaluates the risk impacts of containment leaktightness, and concludes that containment leak rate can be increased one to two orders of magnitude without significantly impacting risk. Additionally, the relative risk of this alignment is reduced due to the short duration of time that the instrumentation is open to the Auxiliary Building.

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