

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 0 4

TITLE (4)  
Incorrect Calibration of UHI Level Instrumentation

| 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              | 5   | 10   | 85             | 85                | 036             | 0               | 0   | 06   | 2                             | 7 | 8                | 5 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)

|                               |  |   |   |  |
|-------------------------------|--|---|---|--|
| OPERATING MODE (9) <u>3</u>   | <input type="checkbox"/> 20.402(b)         | <input type="checkbox"/> 20.406(c)                  | <input type="checkbox"/> 50.73(a)(2)(iv)      | <input type="checkbox"/> 73.71(b)  |
| POWER LEVEL (10) <u>01010</u> | <input type="checkbox"/> 20.406(a)(1)(i)   | <input type="checkbox"/> 50.38(c)(1)                | <input type="checkbox"/> 50.73(a)(2)(v)       | <input type="checkbox"/> 73.71(e)  |
|                               | <input type="checkbox"/> 20.406(a)(1)(ii)  | <input type="checkbox"/> 50.38(c)(2)                | <input type="checkbox"/> 50.73(a)(2)(vii)     | <input checked="" type="checkbox"/> OTHER (Specify in Abstract below and in Text, NRC Form 366A) |
|                               | <input type="checkbox"/> 20.406(a)(1)(iii) | <input type="checkbox"/> 50.73(a)(2)(i)             | <input type="checkbox"/> 50.73(a)(2)(viii)(A) | <u>50.72(b)(1)(ii)</u>   |
|                               | <input type="checkbox"/> 20.406(a)(1)(iv)  | <input checked="" 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: Roger W. Ouellette, Associate Engineer - Licensing TELEPHONE NUMBER: 7 10 14 3 17 1 3 1 - 1 7 1 5 1 3 1 0

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

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

On May 10, 1985, it was determined that the level instrumentation for the Upper Head Injection (UHI) System water accumulator tank had been incorrectly calibrated on October 5, 1984. The calibration failed to account for atmospheric pressure. A work request was completed on May 11, 1985, that recalibrated the instruments to the corrected setpoint.

This incident is classified as a Procedural Deficiency, because the UHI level transmitters and isolation valves calibration procedure contained the incorrect setpoints. Unit 1 was in Mode 3 (Hot Standby) at the time of discovery of the incident.

This incident is reportable pursuant to 10 CFR 50.73, Section (a)(2)(ii)(B), and 10 CFR 50.72, Section (b)(1)(ii)(B).

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## LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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| Catawba Nuclear Station, Unit 1 | 0500041385        | -036           | -000              | 2               | OF       | 04 |

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

The Upper Head Injection (UHI) System is a separate and independent portion of the Safety Injection (SI) System. It is designed primarily to provide additional core cooling during the blowdown phase of a LOCA following a large Reactor Coolant (NC) cold leg break. The system is primarily composed of an 1800 cubic foot nitrogen gas accumulator and an 1800 cubic foot water accumulator filled with borated water of approximately 2000 ppm. These two tanks are separated by a rupture disk and strainer assembly. During a postulated LOCA, as NC pressure decreases, the UHI membrane in the gas crossover line will rupture at a UHI/NC pressure differential of 40 psid. Flow will be initiated through the UHI water accumulator discharge lines to the reactor vessel head, until a volume of  $976 \pm 50$  cubic feet of water is injected. This amount of water is terminated by closure of two series pairs of power-operated isolation valves (INI245A, INI243A, INI244B, and INI242B) which are operated when a low level signal is received from current switches associated with UHI water accumulator level transmitters (INILT5720, INILT5740, INILT5730, and INILT5750, respectively). A UHI accumulator level of 93.2 inches above the working line on the tank was determined by pre-operational test TP/1/A/1200/03B, Upper Head Injection System Functional Test, to be the point where the discharge isolation valves close for the correct amount of injection water to enter the reactor.

Technical Specification Surveillance (Item 4.5.1.2c.1) requires that each accumulator discharge isolation valve closes automatically when the water level is  $93.2 \pm 2.7$  inches above the working line on the water filled accumulator. Calibration procedure IP/1/A/3143/01, Upper Head Injection System Level Transmitters and Isolation Valves, is used to fulfill this surveillance requirement.

On October 12, 1982, Section 12.5.67 of TP/1/A/1200/03B was performed. The setpoint for closure of the discharge isolation valves was calculated to be 93.2 inches above the working line on the accumulator. The four level switches (INILS5720, INILS5730, INILS5740, and INILS5750) were set at a differential pressure that corresponded to this tank level. This was approximately equivalent to 50.8 INWD with the tank at atmospheric pressure per the Westinghouse Startup Manual. However, the values recorded on Enclosure 13.9 for Actual Level Switch Setpoints were 93.04 in., 93.14 in., and 93.20 in., and 93.06 in., respectively. When the actual blowdown took place during the test, the amount of water injected was 974 cubic feet, which was well within the allowed volume of  $976 \pm 50$  cubic feet. Therefore, no adjustments were made to the level switches at that time.

In the fall of 1983, the Engineer responsible for the UHI System was reviewing Procedure OP/1/A/3143/01. He questioned the setpoint values for INILS5720, INILS5730, INILS5740, and INILS5750 being 51.3 INWD. (The latest procedure change gave no justification for this setpoint being different from the value of 50.8 INWD which corresponded to 93.2 inches on the Westinghouse graph.) New setpoints were calculated, compensating for an 815 psig nitrogen pressure (the final blowdown pressure determined from TP/1/A/1200/03B) being present in the tank. On August 31, 1983, procedure change 6 was made to IP/1/A/3143/01 to incorporate a new setpoint of 47.9 INWD for the level switches which accounted

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

for nitrogen overpressure and boron concentration. The level switches were not recalibrated at this time because they were to be replaced and were not required until Modes 1, 2 and 3 with pressurizer pressure above 1900 psig per Technical Specifications.

On October 6, 1984, Nuclear Station Modification (NSM) 10137 was implemented to replace the Barton 288A level switches (INILS5720, INILS5730, INILS5740, and INILS5750) with Rosemount 1153DB4 level transmitters and Rochester ET-1214 current switches. On October 5, the current switches had been initially calibrated to 47.88 INWD.

On April 26, 1985, a review was begun to see if Catawba's UHI level instrumentation had any problems similar to those experienced with McGuire's. It was noted that a discrepancy existed between the Catawba and McGuire Technical Specifications. In the McGuire Technical Specifications, it was indicated that the water accumulator discharge isolation valve closure setpoint was with atmospheric pressure in the accumulator. This was not specified in the Catawba Technical Specifications. On May 3, 1985, after discussion with Westinghouse, it was determined that Catawba's setpoint should have also been with the tank at atmospheric pressure. The correction for the additional presence of nitrogen at blowdown pressure did not need to be considered. On May 8, 1985, the Engineer was contacted about the findings. On May 10, 1985, after discussions, the Engineer initiated procedure change 15 to IP/1/A/3143/01 to change the UHI water accumulator level setpoints from 47.7 INWD (which accounted for the nitrogen overpressure and boron concentration in the tank and instrument reference leg) to 51.0 INWD (which accounted for only boron concentration in the tank and reference leg). A Work Request was issued on May 10, 1985, to recalibrate each current switch for level transmitters INILT5720, INILT5730, INILT5740, and INILT5750 to this setpoint. The "as found" setpoints prior to correction were as follows (for atmospheric conditions):

- Channel 5720 - 97.30 inches above working line
- Channel 5730 - 96.32 inches above working line
- Channel 5740 - 96.70 inches above working line
- Channel 5750 - 96.38 inches above working line

Technical Specification (3/4.5.1.2c.1) requires a setpoint of 93.2 +/- 2.7 inches above the working line. It is not clear from the wording that this applies to atmospheric conditions. Since the "as found" setpoints deviated from the 93.2 inch setpoint by between 3.12 and 4.10 inches, the 2.7 inch allowance of the Specification had been violated.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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|  |  | 8   5          | -   0   3   6     | -   0   0       |          |       |

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

This incident is classified as a Procedural Deficiency, because the procedure, IP/1/A/3143/01, used to calibrate the current switches that close the UHI water accumulator discharge isolation valves on low level, specified incorrect setpoints. The procedural deficiency was due to a misinterpretation of the Technical Specifications. It was not recognized that the setpoint of 93.2 inches above the working line on the water filled accumulator was with atmospheric pressure in the tank. This caused the Engineer to assume the 93.2 inches above the working line was with the final nitrogen blowdown pressure in the accumulator.

CORRECTIVE ACTION

- 1) Procedure change 15 was made to Procedure IP/1/A/3143/01 to change the setpoints of the current switches to actuate at 51.0 INWD instead of 47.7 INWD, which accounted for the presence of the nitrogen blanket.
- 2) The current switches associated with level transmitters 1NILT5720, 1NILT5730, 1NILT5740, and 1NILT5750 were recalibrated to the proper setpoint.

SAFETY ANALYSIS

The effect of the current switches set at a point equal to 47.7 INWD instead of 51.0 INWD would have meant that the level above the working line in the water-filled accumulator for discharge isolation valve closure would have been approximately 96.3 inches, instead of the required 93.2 inches. The "as found" data of 97.3, 96.32, 96.70, and 96.38 inches above the working line for channels 5720, 5730, 5740, and 5750, respectively, deviated from the required setpoint of 93.2 inches from 3.12 to 4.1 inches. This would reduce the accumulator water injection volume by approximately 22.87 to 30 cubic feet from the required injection volume of 976 cubic feet. This would have been within the Acceptance Criteria of  $976 \pm 50$  cubic feet for the Upper Head Injection System Functional Test.

From a review performed by Westinghouse, it was determined that the delivered volume of the Upper Head Injection System with the previously calibrated setpoint may have differed from the Emergency Core Cooling System (ECCS) analysis assumptions by 10-15 cubic feet, if uncertainty and single failure allowances are accounted for. This possible deviation of 10-15 cubic feet is not considered to have had any significant impact on the safety of Catawba Unit 1 prior to the correction of the isolation setpoint.

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

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VICE PRESIDENT  
NUCLEAR PRODUCTION

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June 27, 1985

Document Control Desk  
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 413/85-36 concerning incorrect calibration of UHI level instrumentation. This event was considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

*H. B. Tucker 1/85*

Hal B. Tucker

RWO:slb

Attachment

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