

June 24, 2002

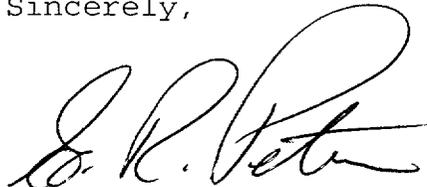
U. S. Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555-0001

SUBJECT: Duke Energy Corporation
Catawba Nuclear Station Units 1 & 2
Docket Nos. 50-413, 50-414
Licensee Event Report 413/02-002 Revision 0
Condition Prohibited by Technical Specifications -
Failure to Comply with the Required Actions of TS
3.9.2 with One Train of the Boron Dilution
Mitigation System Inoperable

Attached please find Licensee Event Report 413/02-002
Revision 0, entitled "Condition Prohibited by Technical
Specifications - Failure to Comply with the Required Actions
of TS 3.9.2 with One Train of the Boron Dilution Mitigation
System Inoperable."

This Licensee Event Report does not contain any regulatory
commitments. This event is considered to be of no
significance with respect to the health and safety of the
public. Questions regarding this Licensee Event Report
should be directed to R. D. Hart at (803) 831-3622.

Sincerely,



G. R. Peterson

Attachment



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xc:

L. A. Reyes
U. S. Nuclear Regulatory Commission
Regional Administrator, Region II
Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, GA 30303

C. P. Patel (addressee only)
NRC Senior Project Manager (CNS)
U. S. Nuclear Regulatory Commission
Mail Stop O-H812
Washington, DC 20555-0001

D. J. Roberts
Senior Resident Inspector (CNS)
U. S. Nuclear Regulatory Commission
Catawba Nuclear Site

LICENSEE EVENT REPORT (LER)

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

Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME Catawba Nuclear Station, Unit 1	2. DOCKET NUMBER 05000 413	3. PAGE 1 OF 8
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4. TITLE
Condition Prohibited By Technical Specifications - Failure to Comply with the Required Actions of TS 3.9.2 with One Train of the Boron Dilution Mitigation System Inoperable

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
04	30	2002	2002	- 002 -	00	06	24	2002	None	
									FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE 6	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)									
	20.2201(b)	20.2203(a)(3)(ii)	50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)						
10. POWER LEVEL 0%	20.2201(d)	20.2203(a)(4)	50.73(a)(2)(iii)	50.73(a)(2)(x)						
	20.2203(a)(1)	50.36(c)(1)(i)(A)	50.73(a)(2)(iv)(A)	73.71(a)(4)						
	20.2203(a)(2)(i)	50.36(c)(1)(ii)(A)	50.73(a)(2)(v)(A)	73.71(a)(5)						
	20.2203(a)(2)(ii) X	50.36(c)(2)	50.73(a)(2)(v)(B)	OTHER Specify in Abstract below or in NRC Form 366A						
	20.2203(a)(2)(iii)	50.46(a)(3)(ii)	50.73(a)(2)(v)(C)							
	20.2203(a)(2)(iv)	50.73(a)(2)(i)(A)	50.73(a)(2)(v)(D)							
	20.2203(a)(2)(v) X	50.73(a)(2)(i)(B)	50.73(a)(2)(vii)							
	20.2203(a)(2)(vi)	50.73(a)(2)(i)(C)	50.73(a)(2)(viii)(A)							
20.2203(a)(3)(i)	50.73(a)(2)(ii)(A)	50.73(a)(2)(viii)(B)								

12. LICENSEE CONTACT FOR THIS LER

NAME R. D. Hart, Regulatory Compliance	TELEPHONE NUMBER (Include Area Code) 803-831-3622
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

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

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

On April 30, 2002, at approximately 0100 with Unit 1 in Mode 6, vital AC instrument panel board 1ERPD was removed from service for scheduled maintenance. Removing 1ERPD from service rendered train B of the Boron Dilution Mitigation System (BDMS) inoperable and it also disabled the Source Range Nuclear Instrument N-32 High Flux at Shutdown alarm function. Operations did not recognize that these functions were inoperable until approximately 0530. Technical Specification (TS) 3.9.2 requires two trains of BDMS operable in Mode 6. If one train becomes inoperable, there are several required actions that have to be completed. Therefore, since the required actions of TS 3.9.2 were not completed within the time allowed, this is a condition prohibited by TS and reportable to the NRC as an LER. The root cause was less than adequate use of available information to properly identify the effects of isolating 1ERPD. Corrective actions include discussing this event with the personnel involved, development of Operations Management guidance, and reviewing this event in Licensed Operator Training. This event is considered to be of no significance with respect to the health and safety of the public.

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NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

BACKGROUND

Catawba Nuclear Station Units 1 and 2 are Westinghouse Pressurized Water Reactors [EIIS: RCT]. Catawba has installed a Boron Dilution Mitigation System (BDMS) [EIIS: IG]. The primary purpose of BDMS is to mitigate the consequences of the inadvertent addition of unborated primary grade water into the reactor coolant system (RCS) [EIIS: AB]. The shutdown margin monitor portion of BDMS measures the count rate from a neutron counting instrument. It also provides an alarm output to indicate a decrease in reactor shutdown margin when the count rate increases by a calculated amount. The shutdown monitor alarm setpoint is continuously recalculated and automatically reduced as the reactor is shutdown and the neutron flux is reduced. An alarm will occur when the time averaged neutron count rate increases due to a reactivity addition to a value determined by the BDMS. There are two redundant channels. In addition to providing an alarm on the main control boards, an alarm in either channel will automatically shutoff both reactor makeup water pumps [EIIS: P], align the suction of the charging pump [EIIS: P] to highly borated water from the refueling water storage tank (RWST) [EIIS: DA], and isolate flow to the charging pumps from the volume control tank [EIIS: TK].

Limiting Condition for Operation (LCO) 3.9.2 requires that when the unit is in mode 6, that two BDMS trains be operable to ensure that appropriate monitoring capability is available to detect changes in core reactivity.

With only one or no BDMS trains available core alterations and positive reactivity additions must be suspended immediately. In addition, the unborated water source must be isolated within one hour and RCS boron concentration must be verified once per 12 hours. An option to isolate the unborated water source is provided to allow alternate methods of monitoring core reactivity conditions and controlling boron dilution incidents. This includes the utilization of the two Source Range Neutron Flux Monitors [EIIS: IG]. These monitors must be verified to operate with alarm setpoints less than or equal to one-half decade above the steady-state count, each with continuous visual indication in the control room. In addition, the combined flow rate from both Reactor Makeup Water Pumps must be verified to be within the limits specified in the Core Operating Limits Report (COLR) in 1 hour. Once these

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options are verified, core alterations and positive reactivity changes can continue.

On April 30, 2002, at approximately 0100 with Unit 1 in Mode 6, vital AC instrument [EIIS: EF] panel board 1ERPD [EIIS: BD] was removed from service for scheduled maintenance. Removing 1ERPD from service rendered train B of BDMS inoperable and it also disabled the Source Range Nuclear Instrument N-32 High Flux at Shutdown alarm function. Operations did not recognize that these functions were inoperable until approximately 0530. Therefore, the required actions of TS 3.9.2 were not completed within the time allowed. This is a condition prohibited by TS.

This event is being reported under 10 CFR 50.73(a)(2)(i)(B) (any operation or condition prohibited by the plant's Technical Specifications (TS)), and 10CFR50.36(c)(2)(i) (Limiting Condition for Operation (LCO) not met).

At the time this condition was identified, Unit 1 was operating in Mode 6, "Refueling." The reactor head was still in place and no core alterations were in progress. No structures, systems, or components were out of service at the time of this event that contributed to the event.

EVENT DESCRIPTION

(Dates and times are approximate)

Date/Time

Event Description

04/2002

Several weeks prior to 1EOC13, work requiring isolation of Vital AC Panel board 1ERPD was scheduled to be performed in Mode 5 with the RCS System at 100% level. Tech Spec 3.3.9 BDMS will allow one train of BDMS to be inoperable during Mode 5 for 48 hours prior to requiring action. The information provided for the schedule review did not include clear information stating that both B-Train BDMS and the Source Range High Flux at Shutdown alarm for N-32 function would be inoperable.

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4/17/02 Removal and Restoration {Block Tag Out (BTO) BTO 12-470} was reviewed by the Electrical Assistant Outage Manager (AOM) group. It was recognized that B train BDMS would be affected, and that this would require both Source Range detectors (N-31 and N-32) to be operable.

4/22/02 A conflict was identified with removing 1ERPD from service during Mode 5 when low temperature overpressure protection (LTOP) is required. RCS Wide Range Pressure indication would be deenergized which would affect the LTOP input to RCS pressurizer power operated relief valve 1NC-32B. A significant schedule change request was initiated per procedure to move the 1ERPD work in the outage. It was recognized at this time that B train of BDMS would be inoperable. This information was not put in the pre-job brief for this evolution.

4/27/02/ 1243 Unit 1 entered Mode 5.

4/29/02/ 0942 Unit 1 entered Mode 6.

4/29/02/ 2337 The execution package for the 1ERPD evolution was taken to the outage control center (OCC). The OCC SRO made an entry into the Technical Specification Action Item Log (TSAIL) for the isolation of vital AC panel 1ERPD. Neither BDMS nor the Source Range High Flux at Shutdown Alarm for N-32 was entered into TSAIL. The package provided did contain information that if reviewed could have led to identification B train BDMS and the source range high flux at shutdown alarm for N-32.

04/30/02 0015 The Electrical AOM conducted a pre-job brief with the control room team for this evolution. Several items that would be lost were discussed. BDMS and the Source Range High Flux at Shutdown Alarm were not discussed.

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NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

- 4/30/02~0100 Vital AC panel 1ERPD was removed from service per operating procedure OP/1/A/6350/008, 125VDC/120VAC Vital Instrument and Control Power System, for scheduled maintenance. Removing 1ERPD from service rendered B train of BDMS and the Source Range High Flux at Shutdown Alarm for N-32 inoperable.
- 4/30/02~0500 The reactor makeup water pumps (RMWP) failed to start in support of a Pressurizer Relief Tank (PRT) [EIIS: TK] flush. The control room contacted the Electrical AOM to assist in troubleshooting. This resulted in determining that B train of BDMS was inoperable and the control room began actions to comply with the required actions of TS 3.9.2.
- 4/30/02~0530 The maintenance on 1ERPD was completed and the maintenance technicians returned the BTO tags to the control room to allow for restoration of the vital AC instrument panel.
- 4/30/02~0630 Vital Instrument Panel 1ERPD was returned to service and B train of BDMS was declared operable.

CAUSAL FACTORS

The root cause was less than adequate use of available information to properly identify the effects of isolating 1ERPD. There were 2 specific areas where this inappropriate action occurred.

The first occurred when the 1ERPD work was scheduled in Mode 5, where Catawba Nuclear Station Directive (CNSD) CNSD 3.1.30, "Unit Shutdown Configuration Control" recommends "two operable trains of Source range detectors or Boron Dilution Mitigation". The information provided for the schedule review did not include clear information stating that both B-Train BDMS and the Source Range High Flux at Shutdown alarm function for N-32 would be inoperable. If this information had been provided, the schedule review may have been successful in identifying that this was in conflict with CNSD 3.1.30 requirements.

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The second occurred in that the guidance provided to the shifts did not include clear information stating that both B-Train BDMS and the Source Range High Flux at Shutdown alarm function for N-32 would be inoperable. If this information had been provided, the Outage Control Center (OCC) SROs may have been successful in addressing the applicable TS and applying the appropriate required action.

A contributing cause to this event was unclear management expectation for the required level of review performed by the OCC SROs. The current management expectation is that an independent review of the load lists would not be expected of the SRO making the TSAIL entry for complex evolutions. The Electrical AOM would be expected to provide the detailed review. Moving the SRO's responsible for making TSAIL entries from the Work Control Center to the OCC may have reduced the level of review provided by the SRO's making the TSAIL entry.

CORRECTIVE ACTIONS

Immediate:

1. The maintenance performed on Vital AC panel board 1ERPDP was completed, 1ERPDP was returned to service, and BDMS train B was declared operable.

Planned:

1. This event will be discussed with the personnel involved to ensure they understand the root cause and corrective actions.
2. The wording in the low voltage breaker list (CNLT-1705-01.02-04) will be revised to clarify how the source range high flux at shutdown alarm is affected by this panel. This revision will also include the inputs to the other Source Range detectors for both Catawba Units 1 and 2.
3. Operations management will develop guidelines for the expected level of review for the execution SRO in the OCC for removal and restorations and TSAIL entries during outages.
4. The Operations Pre-Job briefings for removing the Vital AC panel boards that power BDMS and the source range detectors will be

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revised to include information stating that both BDMS and source range detectors are affected. This corrective action will be done for both Units 1 and 2.

- This event will be discussed during Licensed Operator Training via Operations Proficiency review.

The planned corrective actions as well as any future corrective actions will be addressed via the Catawba Corrective Action Program. There are no NRC commitment items contained in this LER.

SAFETY ANALYSIS

At the time this event occurred, Unit 1 was in Mode 6 with the reactor vessel head in place and no core alterations or positive reactivity additions on going. Train A of BDMS was operable through out this event. De-energizing vital panel board 1ERPD also disables the RMWPs from being started. During this event the unborated water source isolation valve(s) were not closed and secured, nor was the flow rates of the RMWPs verified to be within the COLR limits. However, since the sources of unborated water require the RMWPs for delivery, the net effect was to prevent the addition of unborated water to the reactor coolant system.

UFSAR Chapter 15.4.6, "Chemical and Volume Control System Malfunction that Results in a Decrease in Boron Concentration in the Reactor Coolant," provides an analysis of a boron dilution event for the Catawba Nuclear Station. For Modes 3-6 with the BDMS inoperable, the results presented in UFSAR Table 15-23 show that, with limitations on flow rates from potential sources of unborated water, there is adequate time for the operator to determine the cause of the dilution, isolate the source of unborated water, and initiate reboration before the shutdown margin is exhausted. In accordance with USNRC Standard Review Plan, Section 15.4.8, NUREG-0800, Rev. 2, July 1981, adequate time is judged to be at least 15 minutes for Modes 3-5 and at least 30 minutes for Mode 6.

In conclusion, the overall safety significance of this event was determined to be minimal and there was no actual impact on the health and safety of the public.

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ADDITIONAL INFORMATION

A review of LERs from the last three (3) years found no LERs written due to outage schedule change review process. Therefore, this event was determined to be non-recurring in nature.

Energy Industry Identification System (EIIS) codes are identified in the text as [EIIS: XX].

This event did not include a Safety System Functional Failure. There were no releases of radioactive materials, radiation exposures or personnel injuries associated with this event.