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October 9, 2003

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

Subject: Catawba Nuclear Station, Unit 2
Docket No. 50-414
Licensee Event Report 414/03-001

Attached is Licensee Event Report 414/03-001 titled "Two Channels of RWST Level Instrumentation Were Rendered Inoperable Following Lightning Strike, Resulting in Technical Specification Violation."

There are no regulatory commitments contained in this letter or its attachment.

This event is considered to be of no significance with respect to the health and safety of the public. If there are any questions on this report, please contact L.J. Rudy at (803) 831-3084.

Sincerely,

Dhiaa M. Jamil

Attachment

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xc (with attachment):

Mr. Luis A. Reyes
Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
61 Forsyth Street, S.W., Suite 23T85
Atlanta, GA 30303

Mr. Robert E. Martin (addressee only)
NRC Senior Project Manager
U.S. Nuclear Regulatory Commission
Mail Stop O8-H12
11555 Rockville Pike
Rockville, MD 20852-2738

Mr. Eugene F. Guthrie
NRC Senior Resident Inspector
Catawba Nuclear Station

INPO Records Center
700 Galleria Place
Atlanta, GA 30339-5957

Marsh & McLennan, Inc.
Mr. Kenneth W. Gannaway
100 N. Tryon Street
Charlotte, NC 28202

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 2	2. DOCKET NUMBER 05000 414	3. PAGE 1 OF 6
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4. TITLE
Two Channels of RWST Level Instrumentation Were Rendered Inoperable Following Lightning Strike, Resulting in Technical Specification Violation

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
08	16	2003	2003	- 001 -	00	10	09	2003		

9. OPERATING MODE 1	10. POWER LEVEL 100%	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)		
		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 L.J. Rudy, Regulatory Compliance	TELEPHONE NUMBER (Include Area Code) 803-831-3084
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
C2c	DA	LT	R369	Y					

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 August 16, 2003, at 0753, Channels 1 and 3 of Refueling Water Storage Tank (RWST) level instrumentation failed high in response to an apparent lightning strike in the area. Both of the failed channels were placed in bypass and Unit 2 entered Technical Specification (TS) Limiting Condition for Operation (LCO) 3.0.3. Unit 2 began a TS required shutdown at 0850 and the NRC Operations Center was subsequently notified. Catawba pursued a Notice of Enforcement Discretion (NOED) with NRC Region II to allow an additional 48 hours to troubleshoot and repair the failed level channels prior to having to place Unit 2 in Mode 3. The NRC verbally granted the NOED at 1115. The first of the two inoperable channels was restored to operable status at 1357, which allowed Unit 2 to exit LCO 3.0.3; therefore, the NOED was never actually utilized. The root cause of this event was determined to be the fact that Channels 1 and 3 of RWST level instrumentation appear particularly sensitive to the effects of lightning. Planned corrective actions in response to this event include improving the RWST level transmitter grounding circuits and quality of ground connections.

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

BACKGROUND

This event is being reported under 10CFR50.73(a)(2)(i)(B), any operation or condition which was prohibited by the plant's Technical Specifications, and 10CFR50.36(c)(2)(i), Limiting Condition for Operation (LCO) not met.

Catawba Nuclear Station Unit 2 is a Westinghouse four-loop pressurized water reactor [EIIS: RCT].

The function of the RWST [EIIS: DA, TK] is to store borated water for the Emergency Core Cooling Systems (ECCS) and the Containment Spray System [EIIS: BE] for use during accident conditions and to provide a source of water to the spent fuel pool during refueling and makeup operations and to the Chemical and Volume Control System [EIIS: CB] during abnormal operating conditions. Each Catawba unit has its own RWST.

Four water level indicator channels [EIIS: LI, CHA], with gauges in the control room [EIIS: NA], are provided for the RWST. Each level indicator channel provides input to a one-out-of-four (1/4) annunciator [EIIS: ANN] logic for the following annunciators:

<u>Annunciator Designation</u>	<u>Annunciator Function</u>
High level	Protection against RWST overflow
Makeup level	Makeup to RWST required
Low level	Automatic Residual Heat Removal (RHR) pump [EIIS: P] swapover
Low-low level	Containment spray pumps must be secured and pump suction swapped to containment sump

The RWST level channels also provide a low level signal to the 2/4 logic of the Solid State Protection System (SSPS) [EIIS: JC]. This

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signal, in conjunction with a Safety Injection signal, initiates the automatic RHR pump swapover. In addition, the SSPS low level setpoint also deenergizes the RWST heaters.

Each of the level indicator channels is fed from a level transmitter [EIIS: LT] located at the RWST. In addition to the above function, RWST level indication serves as a post-accident monitoring variable.

TS LCO 3.3.2 governs the Engineered Safety Feature Actuation System (ESFAS) [EIIS: JE] Instrumentation. Table 3.3.2-1 delineates requirements for the ESFAS Instrumentation. Function 7b governs the RWST level - low function. This function is applicable in Modes 1, 2, 3, and 4 and requires four channels of this instrumentation. Condition N states that with one channel inoperable, the channel must be placed in bypass within 6 hours or the unit must be in Mode 3 within 12 hours and in Mode 5 within 42 hours. There is no condition listed for more than one channel inoperable; therefore, TS LCO 3.0.3 applies with more than one channel inoperable. TS LCO 3.0.3 requires that action be initiated within 1 hour to place the unit, as applicable, in Mode 3 within 7 hours, in Mode 4 within 13 hours, and in Mode 5 within 37 hours.

When this event occurred, Unit 2 was operating in Mode 1 at 100% power. No structures, systems, or components were out of service that had any effect on the event.

EVENT DESCRIPTION

(Certain event times are approximate)

Date/Time	Event Description
August 16, 2003/0730	Severe thunderstorms were occurring in the vicinity of Catawba Nuclear Station.
0753	Channels 1 and 3 of RWST level instrumentation failed high as a result of an apparent lightning strike in the area. The affected channels were declared inoperable and placed in bypass. Unit 2 entered LCO 3.0.3.

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0800 Plant personnel from various groups began assembling to determine the best course of action. Site management made the decision to pursue a NOED while troubleshooting and repair of the failed channels was in progress. The NOED would request an additional 48 hours to complete the repairs prior to Unit 2 having to be in Mode 3.

0850 Unit 2 began a load reduction to be in Mode 3 by 1453, as required by LCO 3.0.3. Operations personnel subsequently made a telephone notification to the NRC Operations Center pursuant to 10 CFR 50.72(b)(2)(i) regarding the initiation of a TS required shutdown.

1030 A conference call was held between Duke Energy Corporation and the NRC concerning the NOED.

1115 NRC verbally granted approval of the NOED.

1357 Channel 1 was repaired and declared operable. Unit 2 exited LCO 3.0.3.

1715 Channel 3 was repaired and declared operable. Unit 2 exited LCO 3.3.2, Condition N.

CAUSAL FACTORS

The root cause of this event was determined to be the fact that Channels 1 and 3 of RWST level instrumentation appear to be more sensitive than other channels of this instrumentation to the effects of lightning. The increased sensitivity of Channels 1 and 3 is most likely due to differences in the grounding geometry and the quality of the ground connections. Significant differences were observed between Unit 1 and Unit 2 regarding the RWST level transmitter grounding configuration. These differences primarily involve the location and orientation of grounding cables relative to the RWST structure.

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CORRECTIVE ACTIONS

Immediate:

1. Operations declared Channels 1 and 3 of RWST level instrumentation inoperable and placed both channels in bypass.

Subsequent:

1. A NOED was requested and approved by the NRC, which allowed 48 additional hours prior to Unit 2 having to be placed in Mode 3.
2. Channels 1 and 3 of RWST level instrumentation were subsequently repaired and Unit 2 exited LCO 3.0.3 and LCO 3.3.2, Condition N.

Planned:

1. Catawba will improve RWST level transmitter grounding circuits and quality of ground connections to minimize the impact of lightning strikes on the operation of the circuits.

The planned corrective action is being addressed via the Catawba Corrective Action Program. There are no NRC commitments contained in this LER.

SAFETY ANALYSIS

Following the failure of Channels 1 and 3 of RWST level instrumentation, Operations placed the channels in bypass. The functional capability of the RWST level - low function then changed from a 2/4 logic to a 2/2 logic. Although functional reliability was decreased, the capability to transfer suction of the RHR pumps from the RWST to the containment sump was still maintained, assuming no single failure occurred on the remaining two channels. Duke Energy Corporation evaluated the risk implications of remaining at power with the existing 2/2 logic configuration and submitted a NOED to the NRC to request an additional 48 hours for troubleshooting and repair of the two failed channels. It was determined that it was acceptable to remain at power for this limited period of time given the establishment of proper compensatory actions (i.e., there was no net increase in overall plant risk). These compensatory actions consisted of stationing a

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dedicated operator in the control room to monitor level indication on the two operable channels upon receipt of a Safety Injection signal. The operator was to monitor the RWST level channels for proper tracking by monitoring RWST level decrease and corresponding containment sump level increase during the injection phase of a loss of coolant accident. If automatic swapover did not occur, the dedicated operator was to inform the control room Senior Reactor Operator (SRO) that manual swapover to the containment sump was required. This dedicated operator was also to inform the control room SRO to perform a manual swapover if containment sump level reached 4.5 feet, regardless of RWST level (this action would only have been necessary if both of the operable RWST level channels were to fail). Additionally, no other Unit 2 ECCS related components, trains, or systems were to have been removed from service for maintenance or testing during the time period that the NOED was in effect. The NRC subsequently approved the NOED. The first of the two failed RWST level channels was subsequently repaired and declared operable prior to the expiration of the original LCO time limit for Unit 2 to be in Mode 3. Therefore, the NOED was never actually utilized. The second of the two failed RWST level channels was subsequently repaired and declared operable shortly thereafter.

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

ADDITIONAL INFORMATION

Within the last three years, no other LERs occurred at Catawba involving instrumentation channel failures resulting from lightning strikes. 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 is considered reportable to the Equipment Performance and Information Exchange (EPIX) program.

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

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PIP C03-4566
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ENCLOSURE 1

Signature Sheet

Prepared By: L. D. [Signature] Date: 10/9/03
Reviewed By: R. D. [Signature] Date: 10/9/03
C. [Signature] Date: 10/9/03

Date: _____

Date: _____
Approved By: L. D. [Signature] Date: 10/9/03

ENCLOSURES:

1. Regulatory Compliance Signature Sheet
2. References
3. Corrective Action Schedule
4. Cause Code Summary
5. Personnel Contacted

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ENCLOSURE 2

REFERENCES

1. PIP C-03-4566
2. Technical Specification Action Item Log
3. NUREG-1022 Rev 2, Event Reporting Guidelines 10CFR 50.72 and 50.73
4. Letter from Duke Energy Corporation to NRC, dated August 18, 2003
5. Letter from NRC to Duke Energy Corporation, dated August 20, 2003

ENCLOSURE 3

CORRECTIVE ACTION SCHEDULE

Corrective Action	Person Contacted	Person Assigned	Due Date
1	R.G. Neigenfind	R.G. Neigenfind	

ENCLOSURE 4

CAUSE CODE ASSIGNMENT SHEET

CAUSE CODE: Q1h - Direct lightning strike

ENCLOSURE 5

PERSONNEL CONTACTED

1. R.G. Neigenfind