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March 9, 2010

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

Subject: Duke Energy Carolinas, LLC (Duke)
Catawba Nuclear Station, Unit 2
Docket No. 50-414
Licensee Event Report 414/2010-001

Attached is Licensee Event Report 414/2010-001 Revision 0
entitled, "Reactor Mode Change with Limiting Condition for
Operation 3.6.6 Not Met in Violation of Limiting Condition for
Operation 3.0.4."

There are no regulatory commitments contained in this letter.

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 Marc Sawicki at (803) 701-5191.

Sincerely,

James R. Morris

Attachment

IE22

NRR

Document Control Desk

Page 2

March 9, 2010

xc (with attachment):

L.A. Reyes

Regional Administrator, Region II

U.S. Nuclear Regulatory Commission

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LICENSEE EVENT REPORT (LER)

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

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet-mail to infocollects@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NE0B-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an 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 00414	3. PAGE 1 OF 8
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4. TITLE
Reactor Mode Change with Limiting Condition for Operation 3.6.6 Not Met in Violation of Limiting Condition for Operation 3.0.4

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
01	11	2010	2010	- 001 -	00	03	09	2010	N/A	N/A
									N/A	N/A

9. OPERATING MODE	4	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5: (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)		50.36(c)(2)	50.73(a)(2)(v)(B)	
		20.2203(a)(2)(iii)		50.46(a)(3)(ii)	50.73(a)(2)(v)(C)	OTHER
		20.2203(a)(2)(iv)		50.73(a)(2)(i)(A)	50.73(a)(2)(v)(D)	Specify in Abstract below or in
		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 Marc Sawicki	TELEPHONE NUMBER (Include Area Code) 1-803-701-5191
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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

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

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

As part of an extent of condition review of an issue identified in the Fall 2009 Unit 1 refueling outage, it was discovered that during the Spring 2009 Unit 2 outage, a reactor mode change was made with Technical Specification (TS) Limiting Condition for Operation (LCO) 3.6.6 not met, as one train of the Containment Spray (NS) system was inoperable. On April 16, 2009 at 1500, with Unit 2 moving from Mode 5 to Mode 4, LCO 3.6.6 was unknowingly not met, as Surveillance Requirement (SR) 3.6.6.3 could not be met due to a valve incapable of automatically opening in accordance with the SR. This mode change was in violation of LCO 3.0.4.

The issue was identified during the Fall 2009 Unit 1 refueling outage; however, a risk assessment was performed per LCO 3.0.4.b to allow the mode change, preventing the unit from violating TS. After further evaluation, the Unit 2 event was identified and the condition was determined to be reportable on January 11, 2010. The cause of the event was that unclear TS Bases did not address inoperability of the NS system when the valves in question were de-energized. Corrective Action was taken to make all licensed Operations personnel aware of the lessons learned from this event through an Operations Guide. The Emergency Core Cooling System Water Management License Amendment Request was previously submitted and will remove the requirement for automatic actuation of the NS system, thus allowing for the deletion of SR 3.6.6.3. This incident was determined reportable since the plant was in a condition prohibited by TS. There was no safety significance associated with the event.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2) NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISIO N NUMBER	
Catawba Nuclear Station, Unit 2	05000414	2010	- 001	- 00	2 OF 8

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

BACKGROUND

Catawba Nuclear Station Unit 2 is a Westinghouse Pressurized Water Reactor [EIIS: RCT].

The Containment Spray (NS) system [EIIS: BE] provides containment atmosphere cooling to limit post accident pressure and temperature in containment to less than the design values. Reduction of containment pressure and the iodine removal capability of the spray reduce the release of fission product radioactivity from containment to the environment in the event of a Design Basis Accident (DBA).

The NS system consists of two separate trains of equal capacity, each capable of meeting the system design basis spray coverage. Each train includes a NS pump [EIIS: P], one NS heat exchanger [EIIS: HX], spray headers, nozzles [EIIS: NZL], valves [EIIS: V], and piping. Each train is powered from a separate Engineered Safety Feature (ESF) bus [EIIS: BU]. The Refueling Water Storage Tank (RWST) [EIIS: DA] supplies borated water to the NS during the injection phase of operation. In the recirculation mode of operation, NS pump suction is transferred from the RWST to the containment recirculation sump(s). When the NS suction is from the containment recirculation sump, its associated heat exchanger receives Nuclear Service Water (RN) system [EIIS: BI] flow for cooling. The RN system is served by two bodies of water, Lake Wylie and the Standby Nuclear Service Water Pond (SNSWP). Lake Wylie serves as the non-safety class, non-seismic, normal source of nuclear service water. The SNSWP is a Category 1 seismically designed structure with sufficient water to bring the station to cold shutdown following a Loss of Coolant Accident on one unit and a normal cooldown on the other unit.

EVENT DESCRIPTION

For either unit, two trains of the NS are required operable from Modes 1 through 4 per Technical Specification (TS) 3.6.6. During the Spring 2009 refueling outage for Unit 2, one train of NS was inoperable as the Unit went from Mode 5 to 4 during startup. The 'B' train of NS was made inoperable because the sump suction valve was not meeting SR 3.6.6.3, which states that each automatic containment spray valve in the NS flow path must actuate to the

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2) NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISIO N NUMBER	
Catawba Nuclear Station, Unit 2	05000414	2010	- 001	- 00	3 OF 8

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

correct position to meet the SR. TS Bases 3.6.6.3 identifies that the containment sump suction valves in particular are to automatically reposition on a low RWST level coincident with a Safety Injection signal to meet SR 3.6.6.3.

During outages previous to the issue, NS operability was not a concern as these sump valves had power restored prior to entering Mode 4. This was consistent for start-ups on both Units 1 and 2. Due to Residual Heat Removal (ND) system [EIIS: BP] Mode 4 Loss of Coolant Accident (LOCA) concerns, it was determined that the sump suction valve must be de-energized for the associated train of the ND system aligned for Residual Heat Removal operation and power restored once the ND train was realigned for Emergency Core Cooling System (ECCS) operation after entering Mode 4. The Station continues to employ this process during startup to avoid the ND system Mode 4 LOCA issue.

Failure to recognize the inoperability of the NS train in Mode 4 during unit shutdown was not reportable since Mode 5 was entered within the 72 hour action time of LCO 3.6.6 for an inoperable train. LCO 3.0.4.b, which requires that a risk assessment be performed prior to a Mode change with an LCO not met, was not used during the Unit 2 outage startup. LCO 3.0.4.b is performed to assess the impact of an inoperable train of NS. During the reportable event, the inoperable train of NS was returned to operable status 65 minutes after entering the action statement for LCO 3.6.6, well within the 72 hour action statement required. Therefore, this event is reportable only against LCO 3.0.4, because of an operation or condition prohibited by TS.

During the Fall 2009 Unit 1 refueling outage, it was determined that a risk assessment per LCO 3.0.4.b should be completed before the Mode 5 to Mode 4 change for Unit 1. Inoperability of the one NS train was within the 72 hour limit required by TS 3.6.6, as both trains of NS were operable after 6 hours and 13 minutes of entry into the Action Statement. Therefore, the Station acted according to TS for the Unit 1 outage.

This event is being reported under 10 CFR 50.73(a) (2) (i) (B) for an operation or condition prohibited by the plant's TS. No additional structures, systems, or components were out of service at the time of this event that contributed to the event.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2) NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISIO N NUMBER	
Catawba Nuclear Station, Unit 2	05000414	2010	- 001	- 00	4 OF 8

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

Sequence of Events Timeline
(Dates and times are approximate)

- 1/2/2008 McGuire Nuclear Station initiates a Problem Investigation Process (PIP) to address two Mode 4 LOCA issues. The PIP determined one of the issues was applicable to Catawba. It concerned auto-swap to the containment sump during Residual Heat Removal operation resulting in an additional LOCA path from Reactor Coolant System (RCS) hot leg through the open ND loop suction isolations to the containment sump through containment sump isolation valves NI-185A or NI-184B (i.e. Safety Injection (NI) system [EIIIS: BQ]).
- 1/28/2008 Catawba initiates a PIP to address the concern coming from McGuire's corrective action program. From this PIP Catawba discovers they have Mode 4 LOCA issues and the need to de-energize the containment sump valves is formulated to resolve the problem.
- 3/7/2009 04:04 Unit 2 enters Mode 2 as 2EOC16 outage begins.
- 3/7/2009 11:31 Power removed from containment sump isolation valve 2NI-184B.
- 3/7/2009 14:14 Unit 2 enters Mode 5 (NS is no longer required operable).
- 3/23/2009 The Controlling Procedure for Unit Startup for Unit 2 is approved. This revision adds step to restore power to the containment sump isolation valve after the last ND train is secured. The Mode 4 check list is also revised.
- 4/16/2009 15:00 Unit 2 makes mode change from Mode 5 to Mode 4 during startup. One train of the NS system is inoperable due to containment sump valve 2NI-184B being de-energized. This mode change is done in violation of TS 3.0.4, as no risk assessment per 3.0.4.b was performed.
- 4/16/2009 15:27 ND 'B' train is secured.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2) NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISIO N NUMBER	
Catawba Nuclear Station, Unit 2	05000414	2010	- 001	- 00	5 OF 8

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

- 4/16/2009 16:05 Power is restored to containment sump valve 2NI184B. Both trains of the NS system are operable and the Station meets LCO 3.6.6.
- 11/7/2009 04:21 Unit 1 commences shutdown for refueling outage 1EOC18.
- 11/7/2009 05:24 Containment sump isolation valve 1NI-184B is de-energized.
- 11/7/2009 10:25 Unit 1 enters Mode 5 (NS is no longer required operable).
- 12/6/2009 The Controlling Procedure for Unit Start-up is approved. This revision adds step to restore power to the containment sump isolation valve after the last ND train is secured. The Mode 4 check list is also revised.
- 12/8/2009 Catawba initiates a PIP to address the effect of de-energizing containment sump isolation valves on NS operability when the associated train of ND is aligned for Residual Heat Removal operation. This issue was brought up by the Operations support group during review of procedure revisions for an earlier PIP.
- 12/9/2009 Risk assessment is performed to allow the use of LCO 3.0.4.b to support a mode change with one train of NS inoperable.
- 12/9/2009 Revision of the Unit 1 Controlling Procedure for Unit Start-up is approved. Step added to Mode 4 check lists to ensure the ND train that remains aligned for Residual Heat Removal operation is logged for tracking per TS 3.5.3.
- 12/12/2009 04:00 Unit 1 entered Mode 4 from Mode 5. 'B' train of NS is declared inoperable due to 1NI-184B being de-energized and the stroke test of NS valve 1NS1B not being completed.
- 12/12/2009 08:38 Power is restored to containment sump isolation valve 1NI-184B.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2) NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISIO N NUMBER	
Catawba Nuclear Station, Unit 2	05000414	2010	- 001	- 00	6 OF 8

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

12/12/2009 10:13 'B' train of NS is declared operable. Station exits LCO 3.6.6.

CAUSAL FACTORS

The root cause for entering Mode 4 with an inoperable NS train on April 16, 2009, was due to a failure to recognize the tie between ECCS TS 3.5.3 and NS TS 3.6.6. The wording within ECCS TS Bases 3.5.3 and the NI system Design Bases Document (DBD) which includes the containment sump suction valves does not address NS inoperability with power removed from these valves.

Several factors influenced the organizations' inaction while entering Mode 4 with the particular valve de-energized. The particular containment sump isolation valve is considered to be part of ECCS. Also, only one train of ECCS is required to be operable in Mode 4, and automatic transfer to containment sump is not required. The same logic was inadvertently applied to the NS system. An ND train is considered operable for ECCS while aligned in Residual Heat Removal mode as long as it is capable of being manually aligned. Within the process valve evaluation of containment sump isolation valve 2NI-184B, which is contained in the NI DBD, only ECCS operability is discussed with no mention of NS operability.

CORRECTIVE ACTIONS

Immediate:

1. Reportability determination was completed to understand if the NS train was inoperable for the most recent Unit 1 outage, and it was determined the 3.0.4.b risk assessment was used correctly. Extent of condition then concluded that the past Unit 2 outage case was reportable as per this Licensee Event Report. No other immediate actions were necessary as the event was historical in nature.

Subsequent:

1. Lessons learned were communicated to affected personnel by an Operations Guide.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2) NUMBER (2)	LER NUMBER (6)			PAGE (3)
Catawba Nuclear Station, Unit 2	05000414	YEAR	SEQUENTIAL NUMBER	REVISIO N NUMBER	7 OF 8
		2010	- 001	- 00	

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

2. The Unit Startup procedure was placed on "Tech Hold" so that the issue will be dealt with correctly in accordance with TS prior to any unplanned outage startup.

Planned:

1. Revise the NI and NS DBD to identify the relationship between the containment sump isolation valve and NS operability.
2. A License Amendment Request (LAR) has been previously filed by the station which will remove the requirement of SR 3.6.6.3. The deletion of the SR is justified as automatic NS alignment actions to draw suction from containment sump will no longer be required. The ECCS Water Management LAR was submitted on September 2, 2008, and its approval is expected by September 2010, before the next scheduled refueling outage. Any subsequent start-ups previous to this LAR approval will be completed with an entrance into LCO 3.0.4.b.

SAFETY ANALYSIS

This event consists of a failure to do a risk assessment in accordance with LCO 3.0.4.b. Based on the risk assessment for other outages, a risk assessment would have shown that it was acceptable to go up in mode with only one train of NS. This conclusion is based, in part, on the following:

- NS is not one of the identified high risk systems, therefore use of LCO 3.0.4.b is allowed.
- There is a reasonable expectation that the LCO will be met within the LCO completion time. With one NS train inoperable in Mode 4, the TS action is to restore the NS train to operable status within 72 hours.
- NS has little impact on Core Damage Frequency (CDF) and Large Early Release Frequency (LERF) risk. At Catawba, LERF is driven by containment bypass and station blackout sequences.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2) NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISIO N NUMBER	
Catawba Nuclear Station, Unit 2	05000414	2010	- 001	- 00	8 OF 8

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

- Removal of an NS train from service during on-line conditions is usually acceptable.
- Manual alignment capability of the NS system to draw from the containment sump existed throughout the event.

Therefore, there was no additional risk incurred as a result of failing to perform the risk assessment required by 3.0.4.b.

ADDITIONAL INFORMATION

After a search of the past three years' history for Catawba Nuclear Station, there have been no reportable events with respect to unintended mode changes or any other failure to comply with LCO 3.0.4. Licensee Event Report 2009-001 documents the sole reportable event in the last three years regarding NS operability as per TS 3.6.6. In that instance, the Component Cooling System (KC) Heat Exchanger Control Valve failed to control flow to the KC Heat Exchanger which caused both trains of NS to be inoperable for approximately two days. This past case is not related to the current event.

This event does not constitute a Safety System Functional Failure as one of the two trains of NS was operable throughout the incident.