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March 13, 2000

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

SUBJECT: Duke Energy Corporation
Catawba Nuclear Station Unit 1
Docket No. 50-413
Licensee Event Report 413/00-002 Revision 0

Attached please find Licensee Event Report 413/00-002 Revision 1, entitled "Bypassed Compensatory Action on ECCS Pump Area Sump Pumps Caused Plant to be in a Condition Outside the Design Basis". The only commitments in this Licensee Event Report are those described in the "Planned Corrective Actions" section. 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:

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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 information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), 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. If 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.

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TITLE (4)
Bypassed Compensatory Action on ECCS Pump Area Sump Pumps Caused Plant to be in a Condition Outside the Design Basis

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 NAME	DOCKET NUMBER
02	10	2000	2000	00	00	03	13	2000	Catawba Unit 2	05000414
									FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)						
POWER LEVEL (10) 100 %	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input checked="" type="checkbox"/> 50.73(a)(2)(ii)	<input type="checkbox"/> 50.73(a)(2)(x)						
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(iii)	73.71						
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(iv)	OTHER						
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)							
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)							

LICENSEE CONTACT FOR THIS LER (12)

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED			
YES (If yes, complete EXPECTED SUBMISSION DATE).	<input checked="" type="checkbox"/>	NO		N/A	MONTH	DAY	YEAR

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

On February 21, 2000 plant personnel determined that a condition outside the design basis of the plant had occurred on Unit 1 & Unit 2 due to defeating part of a compensatory action for monitoring potential emergency core cooling system (ECCS) leakage outside containment. The compensatory action was initiated because of an interlock that was not installed during the original construction of the plant as described in LER 413-98-016. The interlock was supposed to trip the residual heat removal and containment spray sump pumps upon receipt of a safety injection signal and allow the pumps to start on high-high sump level, with an accompanying Control Room alarm. This interlock was to facilitate leak detection from ECCS components outside containment following a loss of coolant accident. This compensatory action was found defeated on February 10 and 16, 2000. Subsequent reviews found another 7 times that the compensatory action was defeated. The root cause was that compensatory actions are not reviewed and integrated into appropriate processes to ensure communications and coordination takes place to maintain compliance with the requirements. Interim corrective action consisted of restoring the compensatory action to service and increasing the approval authority to allow defeating this compensatory action. Planned corrective actions include a review and revision of the compensatory action program to preclude recurrence.

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

Background

Catawba Nuclear Station, Units 1 and 2 are four loop Westinghouse pressurized water reactors [EIIS: RCT]. Each unit contains an Emergency Core Cooling System (ECCS) which is designed to remove the stored and fission product decay heat from the reactor core during accident conditions. The ECCS includes pumps [EIIS: P], associated piping, valves [EIIS: V], and other related equipment in the Chemical and Volume Control (NV) System [EIIS: CB], Safety Injection System (NI) [EIIS: BQ], Residual Heat Removal (ND) System [EIIS: BP], and Containment Spray (NS) System [EIIS: BE].

The Containment Spray and Residual Heat Removal Pump Room Sump (ND/NS Sump) is a stainless steel lined sump serving as the collection point for leakage in the NS and ND pumps area. This sump also serves to collect overflow from any other room in the Auxiliary Building [EIIS: NF], including the NV and NI pump rooms, since it is located at the lowest elevation in the plant. This sump is shared between the two units and is served by four safety-related sump pumps (two per unit), each with a pumping capacity of 100 gpm. The sump has five level switches [EIIS: LS]. One for each sump pump, and one common to the sump. The pumps have control switches on a local control panel and on a panel in the Control Room [EIIS: NA]. The pumps may be operated in MANUAL, AUTO, or STANDBY. In MANUAL, the pumps will operate regardless of sump level. In AUTO, the pumps will start at the high level setpoint and stop at the low-level setpoint. In STANDBY, the pumps will start at the high-high level setpoint and stop at the low-level setpoint. Additionally, at the high-high level setpoint, an annunciator alarm is generated at the local control panel and an operator aid computer (OAC) alarm is initiated in the Control Room. There is also an Emergency High Level setpoint where an annunciator alarm [EIIS: ANN] is generated both at the local control panel and in the Control Room.

During the licensing process of Catawba the NRC asked a series of questions relating to post-LOCA ECCS leakage, passive failures, flooded ECCS equipment, and loss of Containment sump inventory. Based on these questions, Duke committed to install an interlock which would trip the ND/NS sump pumps on a safety injection signal and allow the pumps to start on high-high sump level. In addition, when the ND/NS sump inventory increased to the high-high level setpoint, an alarm in the control room would alert the operator to the increasing sump level. This was acceptable to NRC as described in Section 6.3.2 of the NRC Safety Evaluation Report (SER). This design feature was added to the Updated Final Safety Analysis Report (UFSAR) in section 6.3.2.5.

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On October 20, 1998, during the review of a proposed modification, Engineering discovered that the ND/NS sump interlock [EIIS: IEL] as described in the UFSAR section 6.3.2.5 was not installed in the plant. As an interim action the control switches for the ND/NS sump pumps were placed in the STANDBY position. This would allow the ND/NS sump pumps to start on a high-high level instead of a high level. In addition, an OAC alarm would be received upon receiving a high-high sump level. This action was formalized in a compensatory action. This missing interlock was reported to the NRC in LER 413-98-016 as a condition outside the design basis of the plant.

On February 10, 2000 Unit 1 Operations noted that no alarms were received when the ND/NS sump pumps automatically started to pump down their respective sumps. Further investigation determined that the OAC point (C1D2612) used to initiate the alarm had been removed from service on August 30, 1999 for sump level switch work. This OAC point was part of a compensatory action. Upon discovery, the OAC point was returned to service. In addition the OAC point security level was increased to a level 3. This level requires Senior Reactor Operator (SRO) permission prior to modifying the OAC point in any manner.

On February 16, 2000, the same OAC point was taken out of service for maintenance work without any additional compensatory action. Upon discovery the OAC point was returned to service.

On February 21, 2000 plant personnel determined the ND/NS Sump high-high level OAC point being removed from service resulted in Unit 1 & Unit 2 being outside their design basis. This is because the potential existed for post-LOCA ECCS leakage, due to a passive failure, to go undetected for an extended period of time beyond the 30 minutes assumed in the UFSAR. This was reported to the NRCOC at 1050 per 10 CFR 50.72(b)(1)(ii)(B). This is also a reportable event pursuant to 10 CFR 50.73(a)(2)(ii)(B), condition outside the design basis of the plant.

A review of OAC point C1D2612 removal from service was completed. This review determined that from October 1, 1998 through August 30, 1999 OAC point C1D2612 was removed and returned to service seven (7) times.

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Event Description

November 19, 1998

LER 413-98-016, Missing Interlock Discovered during a Design Review on ECCS Pump Area Sump Pumps Caused Plant to be in a Condition Outside the Design Basis, was sent to the NRC. The LER described a condition where an NS/ND sump pumps interlock was not installed as described in the UFSAR. The interlock was supposed to trip the sump pumps upon receipt of a safety injection signal and allow the pumps to start on high-high sump level, with an accompanying Control Room alarm, to facilitate leak detection from ECCS components outside containment following a loss of coolant accident. The installation of the interlock was a commitment that was made during the initial NRC license application review and described in the UFSAR but was never installed in the plant. The LER described interim compensatory actions of placing the sump pump switches in STANDBY. This changed the sump pump start to the high-high level setpoint. The high-high level setpoint provides a local alarm and an OAC alarm via OAC point C1D2612. The long term corrective actions were to install the original described interlock. At this time OAC point C1D2612 was assigned a security level 7. This security level is the lowest and allows modification without contacting Operations.

October 1998 through August 30, 1999

A review of OAC point C1D2612 removal from service was done. This review revealed that OAC point was removed from service seven (7) times during routine maintenance activities. On February 17, 1999 OAC point C1D2612 was removed from service at 0831 and returned to service on March 2, 1999 at 0637. On March 2, 1999 OAC point C1D2612 was removed from service at 0721 and returned to service on March 4, 1999 at 1404. On March 10, 1999 OAC point C1D2612 was removed from service at 1018 and returned to service at 1417. On April 20, 1999 OAC point C1D2612 was removed from service at 0931 and returned to service on April 20, 1999 at 1002. On June 30, 1999 OAC point C1D2612 was removed from service at 0843 and returned to service on June 30, 1999 at 0926. On August 4, 1999 OAC point C1D2612 was removed from service at 1033 and returned to service on August 5, 1999 at 1546. On August 18, 1999 OAC point C1D2612 was removed from service at 0935 and returned to service on August 19, 1999 at 1408.

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August 30, 1999

OAC point C1D2612 was removed from service at 1041 for work on the ND/NS sump pump 1A level switch. This was done as part of a plant modification (work orders 98150465 & 98182845). This computer point is required to be inservice to comply with a compensatory action.

February 10, 2000

Radwaste Chemistry discussed with Operations the need to pump down the ND/NS sumps. During this discussion the pumps automatically started to pump down. The control room operator noticed that no annunciator or OAC point alarm was received. Per the compensatory action, an OAC point alarm should have actuated on high-high level. Investigation by Operations discovered OAC point C1D2612 had been removed from service. Upon discovery OAC point C1D2612 was returned to service at 1232. This event was entered in the Problem Investigation Process (PIP) C-00-00592. An OAC minor change was completed to change the security level on OAC point C1D2612 from level 7 to level 3 and add a note to the remarks section of the OAC requiring OPS permission and referring to the relevant compensatory action. A note was added to the Reactor Operator (RO) turnover sheet to enhance the review of OAC points removed from service.

February 16, 2000

A maintenance technician requests permission from Operations to start work on work order (W/O) 98150465 for level switch work. At 1340 OAC point C1D2612 was removed from service by the maintenance technician. While preparing for shift turnover, the RO discovers that OAC point C1D2612 had been removed from service. Upon discovery the OAC point was returned to service at 1741. This event was entered in the Problem Investigation Process (PIP) C-00-00685.

Causal Factors

The root cause of this event was that compensatory actions are not reviewed and integrated into appropriate processes to ensure the required communications and coordination take place to maintain compliance with the stated requirements.

There were no EPIX reportable failures associated with this event.

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A review of LERs for the past twenty-four months indicates one event of a similar nature, but has a different root cause. LER 413-98-016 reported the initial discovery of the ND/NS sump pump interlock that was not installed as described in the UFSAR. This event was due to not coordinating a licensing commitment with the design process. Since these LERs describe the same interlock but different root causes, this event is not considered to be recurring.

Corrective Actions

Immediate

1. For the February 10 & 16, 2000 events, upon discovery OAC point C1D2612 was returned to service.
2. After the February 10, 2000 event, the security level of OAC point C1D2612 was increased from a level 7 to a level 3 and added a note to the remarks section of the OAC requiring OPS permission and referring to the relevant compensatory action. PIP C-00-00592 was reviewed with Operations to brief them on the event.
3. After the February 16, 2000 event, the security level for OAC point C1D2612 was increased to a level 2 via an OAC minor change. This requires the Operations Shift Manager (OSM) permission to modify the point. The remarks section of the OAC was revised to specify OSM permission required.

Subsequent

1. A review of other OAC points that are relied upon for compensatory actions was done. Another 25 points were identified and their security level was increased to a security level 2.
2. A review of procedures PT/1/A/4600/009 & PT/2/A/4600/009 for Loss of OAC was completed to ensure that contingency actions were in place for each OAC point relied upon for a compensatory action.
3. Operations management has provided information to the shifts explaining that OAC points associated with compensatory actions now have a security level 2 clearance that requires the OSM to approve any changes to them.
4. The current active compensatory actions have been reviewed by Operations to ensure they are being properly implemented.

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Planned

1. The current compensatory action implementation process will be reviewed and revised as necessary to enhance the process. This will ensure that compensatory actions are appropriately integrated into plant processes to maintain compliance with the compensatory actions.
2. Upon completion of the revisions to the compensatory action program, appropriate personnel will review the revised program to enhance their knowledge and implementation of compensatory actions.
3. A review of the additional OAC points relied upon for compensatory actions will be done to ensure no similar occurrences have existed. If any additional occurrences are found they will be documented in the corrective action program via generation of a PIP.

Safety Analysis

General Design Criteria 35 includes the requirement to provide suitable leak detection for ECCS. Specifically, during the post-LOCA long term recirculation cooling phase of ECCS, leak detection is required to identify passive ECCS failures outside containment. The design basis of the sump level monitoring system is to provide this post-LOCA leak detection capability. This is accomplished as follows: 1) ensure no more than approximately 2500 gallons of sump inventory is lost prior to alarm generation, 2) ensure a minimum of 30 minute operator response time following alarm generation to prevent sump overflow, and 3) prevent flooding of the ND and NS pumps.

With the OAC alarm point defeated, the ND/NS sump pumps would automatically cycle to pump the sump without actuating any alarm in the control room. This would prevent the flooding of ECCS equipment; however, the operator would not be aware of the potential for excessive loss of sump inventory caused by a passive pump seal failure following a design basis LOCA since there would be no alarm on high-high sump level.

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Radiation monitor alarm(s) and increasing liquid waste tank levels would provide an indirect indication of excessive leakage to the operator and would alert the operator to the need for action. This would allow the operator to investigate the source of the alarms and solicit input from other personnel onsite. However, design basis assumptions about sump inventory loss and operator response time to prevent sump overflow may not be met. Thus, the safety significance of this event is low.

Since no event occurred during the time that the OAC alarm point was defeated that would require the use of the interlock, the health and safety of the public were not affected by this event.