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November 1, 1999


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 413/99-017 Revision 0

Attached please find Licensee Event Report 413/99-017 Revision 0, entitled "Operation Prohibited by Technical Specification 3.8.4 and 3.8.1 concerning DC Power Supply to Diesel Generator 1A due to an Inadequate Procedure". Questions regarding this Licensee Event Report should be directed to J. W. Glenn at (803) 831-3051.

The only commitments in this Licensee Event Report are those described in the "Planned Corrective Actions" section.

Sincerely,

  
G. R. Peterson

Attachment

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xc:

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ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), 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.

**LICENSEE EVENT REPORT (LER)**

FACILITY NAME (1) Catawba Nuclear Station Unit 1	DOCKET NUMBER (2) 05000413	PAGE (3) 1 of 7
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TITLE (4)  
Operation Prohibited by Technical Specification 3.8.4 and 3.8.1 concerning DC Power Supply to Diesel Generator 1A due to an Inadequate Procedure

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(S)
10	02	1999	1999	- 017	- 00	11	01	1999		

OPERATING MODE (9) 1

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

POWER LEVEL (10) 100	20.2201(b)	20.2203(a)(2)(v)	x	50.73(a)(2)(i)	50.73(a)(2)(viii)
	20.2203(a)(1)	20.2203(a)(3)(i)		50.73(a)(2)(ii)	50.73(a)(2)(x)
	20.2203(a)(2)(i)	20.2203(a)(3)(ii)		50.73(a)(2)(iii)	73.71
	20.2203(a)(2)(ii)	20.2203(a)(4)		50.73(a)(2)(iv)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
	20.2203(a)(2)(iii)	50.36(c)(1)		50.73(a)(2)(v)	
	20.2203(a)(2)(iv)	x 50.36(c)(2)		50.73(a)(2)(vii)	

LICENSEE CONTACT FOR THIS LER (12)

NAME J.W. Glenn, Regulatory Compliance	TELEPHONE NUMBER	
	AREA CODE (803)	831-3051

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)

YES (f yes, complete EXPECTED SUBMISSION DATE)	x	NO
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EXPECTED MONTH DAY YEAR

SUBMISSION DATE (15)

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

On October 7, 1999 at 1450 hours with Catawba Unit 1 operating in Mode 1, Power Operation, at 100% power it was determined that Technical Specification Surveillance Requirement (SR) 3.8.4.2 concerning DC Power Sources had not been met when the quarterly battery surveillance was performed on October 2, 1999. Two cells of diesel battery 1DGBA were found below the required per cell voltage and the actions required by Technical Specifications 3.8.4 and 3.8.1 were not taken. This problem was discovered when Engineering was reviewing results of the quarterly battery surveillance.

The root cause of this event was an inadequate procedure. The procedure directed technicians to measure and record cell voltages but did not clearly list the Technical Specification acceptance criteria or give clear instructions on actions to take when low cell voltage readings were found.

Corrective Actions included placing the battery on an equalize charge. One of the affected cells recovered after the equalize charge. The other cell was removed from the battery. Improvements will be made to procedure IP/0/A/3710/017 and similar procedures to clearly state the acceptance criteria.

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Background

Catawba Nuclear Station Unit 1 is a Westinghouse Pressurized Water Reactor. Unit 1 operated in Mode 1, "Power Operation" during this event. The event is being reported pursuant to 10CFR50.73(a)(2)(i)(B), (operation prohibited by Technical Specifications) and 10CFR50.36(c)(2) (Technical Specification Limiting Condition for operation not met).

Unit 1 has two emergency diesel generators [EIIS:DG]. Each diesel generator has an associated battery [EIIS:BT] consisting of 94 nickel cadmium cells with a nominal voltage of 125 VDC. The battery for the Train A Diesel Generator is designated as 1DGBA. Battery 1DGBA supplies one 125 VDC Distribution Center and one Diesel Generator Control Panel [EIIS:PL]. These components are a part of the 125VDC Essential Diesel Auxiliary Power System [EIIS:EI].

Technical Specification 3.8.4 "DC Sources-Operating" requires the A and B Train Diesel Generator DC Electrical Power Subsystems to be operable. With one or more Diesel Generator DC Electrical Power Systems inoperable Action C requires immediate entry into the applicable condition of Technical Specification 3.8.1 for the associated Diesel Generator.

Technical Specification 3.8.1 "AC Sources-Operating" Condition B (one Diesel Generator inoperable) requires the following:

1. Perform Technical Specification Surveillance Requirement 3.8.1.1 (verification of correct breaker alignment and indicated power availability for each offsite circuit) within one hour and once per eight hours thereafter. (and)
2. Declare the required feature(s) supported by the inoperable diesel generator inoperable when its required redundant feature is inoperable. (and)
3. Determine that the operable diesel generator is not inoperable due to a common mode failure -or- perform Technical Specification Surveillance Requirement 3.8.1.2 (verify the diesel starts) for the operable diesel generator. (and)
4. Restore the Diesel Generator to operable status within 72 hours and six days from discovery of the failure to meet the LCO.

During this event several other A Train Systems were inoperable for various reasons. These included Residual Heat Removal, Nuclear Service Water, Component Cooling, Containment Spray, Control Room Ventilation, Auxiliary Building Ventilation, Auxiliary Feedwater, Diesel Starting Air, and Annulus

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Ventilation. Also there was a period of six hours 21 minutes on 10-6-99 during which the B Train of Centrifugal Charging was inoperable. This inoperability was associated with identifying the cause of a higher than normal reading on the gear drive oil pressure gauge. The failure of the gauge was thought to be the probable cause, however contingencies were developed for other possible causes as well. The 1B Centrifugal Charging Pump was secured and it was determined that the oil pressure gauge was defective.

During this evolution, although the pump was declared inoperable, it was not tagged out and it was capable of performing its safety function. The time spent with an actual opening in the gear drive oil system pressure boundary totaled less than two minutes. This gauge does not serve a safety function.

Event Description

- 10-2-1999 1330 Maintenance began the quarterly Surveillance Test of Diesel Generator Battery 1DGBA per Work Order 98192251-01.
- 10-2-1999 1415 Maintenance completed the quarterly Surveillance Test of Diesel Generator Battery 1DGBA. Low voltage readings were found on Cell 9 and Cell 74. The low readings were circled on the procedure data sheet as required by the procedure.
- 10-2-1999 1430 Maintenance began the quarterly Surveillance Test of the Unit 2 Diesel Generator Batteries.
- 10-2-1999 1600 After completing the Unit 2 Diesel Battery surveillances Maintenance technicians discussed the low cell readings found on Battery 1DGBA with the crew supervisor. The crew supervisor directed one of the technicians to discuss the low readings with the Shift Work Manager. In the discussion with the Shift Work Manager the technician did not communicate that the readings concerned the 1A Diesel Battery. The Shift Work Manager instructed the technician to follow the directions in the procedure.
- 10-2-1999 1700 Maintenance technicians placed a copy of the procedure

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data sheet with the low voltage reading in the "Out of Tolerance" box in the IAE Building.

- 10-4-1999 An Engineering representative picked up the data sheets and entered the problem in the Corrective Action Program as an instrument "out of tolerance" problem.
- 10-6-1999 1535 Engineering wrote Corrective Action Program Report (PIP) C-99-4053 to address the out of tolerance problem.
- 10-7-1999 Engineering determined that two cells of Battery 1DGBA did not meet the required voltage of 1.36 VDC per cell. The recorded voltage reading was 1.32 VDC for each cell.
- 10-7-1999 1450 Operations declared Diesel Generator 1A inoperable. 1DGBA was placed on equalize charge for 24 hours.
- 10-8-1999 1700 After the 24 hour equalize charge, Cell 9 voltage was 1.441 VDC and Cell 74 voltage was 1.400 VDC.
- 10-8-1999 2033 Engineering decided to install a temporary modification to jumper Cell 74. An enhanced surveillance was implemented to check the voltage of Cell 9 once per shift for two weeks.
- 10-9-1999 0708 Operations declared Battery 1DGBA operable.
- 10-9-1999 0859 Operations declared Diesel Generator 1A operable.

**Causal Factors**

The root cause of this event was an inadequate procedure. Procedure IP/0/A/3710/017 "Periodic Inspection and Maintenance for SAFT Model SBM277-2 Storage Battery" lacked sufficient detail on reporting discrepancies found during battery inspections. The procedure did reference the technical specification requirements but did not give specific guidance on how to report them. There was also a typographical error in the procedure that directed the work supervisor to a section that listed precautions to take prior to performing the work rather than referencing the section that contained information on what action to take when the equipment was found

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to be inoperable or exceeding technical specification allowable values. The procedure contained several references to out of tolerance conditions and gave specific guidance on how to handle them. The "out of tolerance" process typically applies to instrumentation that meets technical specification requirements but does not meet expected calibration tolerances. The technicians were misled by the procedure into thinking that this was an out of tolerance problem. The problem was handled per the out of tolerance process.

This event is not EPIX reportable. Missed or inadequate surveillance tests are a recurring problem. In the past twenty four months there have been fifteen LERs on missed or inadequate surveillance tests. Site initiatives are in place to improve procedures to explicitly state the technical specification acceptance criteria.

**Corrective Actions**

**Immediate**

1. Engineering notified Operations and Diesel Generator 1A was declared inoperable.

**Subsequent**

1. Cell 74 was removed from Battery 1DGBA. A periodic surveillance of Cell 9 voltage was implemented.
2. Maintenance developed a procedure use and adherence communication for Maintenance supervisors to review with their teams.
3. Work Control began providing Maintenance with a six week look ahead report of scheduled work orders that utilize procedures containing technical specification surveillance test acceptance criteria. This report will be utilized to schedule special briefings of work crews until the procedure changes are completed.

**Planned**

1. Maintenance and the Procedure Group will evaluate all battery procedures that are related to compliance with Technical Specifications or Selected

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Licensee Commitments. Items to be considered are: (1) adding specific guidance in the body of the procedure as well as the data sheets about who to notify when readings are found that do not meet the limits of Technical Specification or Selected Licensee Commitments or administrative limits, (2) removing references to the "out of tolerance" process from battery related procedures, (3) adding specific guidance in the procedure to compare actual readings with Technical Specification or Administrative limits, (4) Ensuring Technical Specification or Administrative limits are clearly defined in the body of the procedure, (5) validating the procedures after the foregoing improvements have been made.

- Maintenance and the Procedure Group will review all Maintenance Procedures with Technical Specification or Selected Licensee Commitment requirements to ensure the acceptance criteria are clearly identified and compared to as found values.

**Safety Analysis**

Although battery 1DGBA was in a degraded condition with two cells below the Technical Specification limit, the battery remained capable of supplying the design basis accident loads for the full design basis time period of two hours with sufficient terminal voltage. Per the manufacturer of the cells used in the battery, the electrical integrity of the battery remained intact. Under worst case conditions, the low-voltage cells could have gone into cell reversal which would have the effect of subtracting the normal cell voltage contribution (approximately 1.2 VDC per cell), from the overall battery terminal voltage. The battery would then have behaved as if two cells were jumpered out. An engineering calculation showed that battery 1DGBA is capable of supplying its design basis loads with two cells jumpered out while maintaining a battery terminal voltage of no less than 112.2 VDC. This calculation assumes that the battery electrolyte temperature is at the design minimum of 60 degrees F. and that the battery capacity is at its end-of-life value of 80% of the nameplate rating (277 Ampere-hours). Per Technical Specification Surveillance Requirement 3.8.4.8, the minimum battery terminal voltage allowed during the service test is 105 VDC; therefore, there is a margin, in voltage terms, of 7.2 VDC.

Since it was determined that battery 1DGBA remained capable of supplying the design basis accident loads during the time the two cells in question were out of spec., it is assumed that the Diesel Generator was also available to



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start during this time. Therefore, the procedure inadequacy had no impact on Core Damage Frequency.

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